

# DIP

## Product Selection Guide



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DIP

DIP											
Series	TDP	TDA	SDA	SD	BD	BPA	TDD	SPA	RTE	CD	CRD
<b>Switch Type</b>	Half-pitch .050" Side actuated	Half-pitch .050"	Low Profile	Low Profile	Standard Profile	Side Actuated	Jumper Switch	Single In-line Package	Rotary & Coded	8 mm Coded Rotary	10 mm Coded Rotary
<b>No. of Positions</b>	2-10 (even only)	1 & 2-10 (even only)	1-12 (except 11)	2-12 (except 11)	1-12 (except 11)	1-12 (except 11)	1	2-10 (even only)	4 10,16	8, 10 & 16	10 & 16
<b>Contact Style</b>	SPST	SPST	SPST	SPST	SPST	SPST	SPDT	SPST	Coded	Coded	Coded
<b>Profile off PCB</b>	.173 (4,4)	.087 (2,2)	.189 (4,80) Thru-hole .177 (4,5) SMT	.168 (4,27) Thru-hole .160 (4,06) SMT	.297 (7,55) Vertical .380 (9,65) Rt. Angle	.287 (7,3) Thru-hole .277 (7,04) SMT	.090 (2,3)	.244 (6,2) Vertical .169 (4,3) Rt. Angle	.167 (4,25) Thru-hole .335 (8,5) Rt. angle	.168 (4,27) Thru-hole .340 (8,6) Rt. angle	.272 (6,9) Vertical .414 (10,5) Rt. angle
<b>Process Sealed</b>	washable with tape seal	washable with tape seal	washable (tape not required)	washable with tape seal	washable (tape not required)	washable (tape not required)	washable with tape seal	washable (tape not required)	NA	washable (tape not required)	washable (tape not required)
<b>Extended Actuator</b>	•		•	•	•	•		•	•		•
<b>Flush Actuator</b>	•	•	•	•			•	•	•	•	•
<b>Thru-hole</b>			•	•	•	•		•	•	•	•
<b>Vertical</b>		•	•	•	•		•	•	•	•	•
<b>Right Angle</b>	•				•	•		•	•	•	•
<b>Surface Mount</b>	•	•	•	•		•	•	•	•	•	•
<b>Tape &amp; Reel (SMT only)</b>	•	•	•	•		•	•	•	•	•	•
<b>Maximum Current</b>	100mA	100mA	100mA	100mA	100mA	100mA	100mA	10mA	100mA	0.4VA	0.4VA
<b>Retention Feature</b>								•	•	• C option	
<b>Page No.</b>	H-3	H-6	H-9	H-13	H-16	H-18	H-21	H-23	H-25	H-31	H-35

# TDP Series Ultra-miniature Surface Mount Half-pitch Side-Actuated DIP Switches



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## Features/Benefits

- World's first ultra-miniature SMT half-pitch side-actuated DIP
- Side actuation allows visual indication of on/off position in horizontal applications
- Process sealed for surface mount soldering and washable processing
- RoHS compliant
- Lead free

## Typical Applications

- Hand-held electronic devices
- Portable computer and electronic devices
- Instrumentation and controls



## Specifications

SWITCH FUNCTION: SPST — 2, 4, 6, 8, 10 positions.

CONTACT RATING:

24 V DC, 25 mA (switching).

50 V DC, 100 mA (steady state).

MECHANICAL AND ELECTRICAL LIFE: 1,000 cycles.

CONTACT RESISTANCE: 100 mΩ max.

INSULATION RESISTANCE: 100 MΩ @ 100 V DC min.

DIELECTRIC STRENGTH: 300 V AC min.

STORAGE TEMPERATURE: -40°C to 85°C.

OPERATING TEMPERATURE: -40°C to 85°C.

OPERATING FORCE: 4,9N max.

SOLDERABILITY: Per MIL-STD-202F method 208D, or

EIA RS-186E method 9 (1 hour steam aging).

PACKAGING: Switches supplied in rigid dispensing tubes in full tube quantities only, this may affect order quantity. Tape and reel packaging also available.

## Materials

CASE & COVER: glass filled PPS (UL94V-0).

ACTUATOR: PA6T (UL94V-0).

CONTACTS: Copper alloy with gold plate over nickel plate.

TERMINALS: Copper alloy, with gold over nickel plate.

All terminals are insert molded.

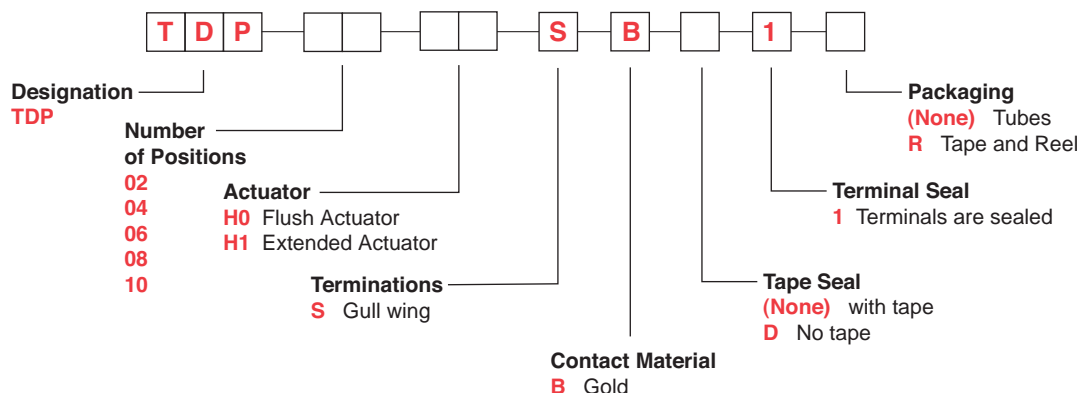
TAPE SEAL: Polyimide.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position.



**Note:** Tape seal is not available with H1 Extended Actuators.

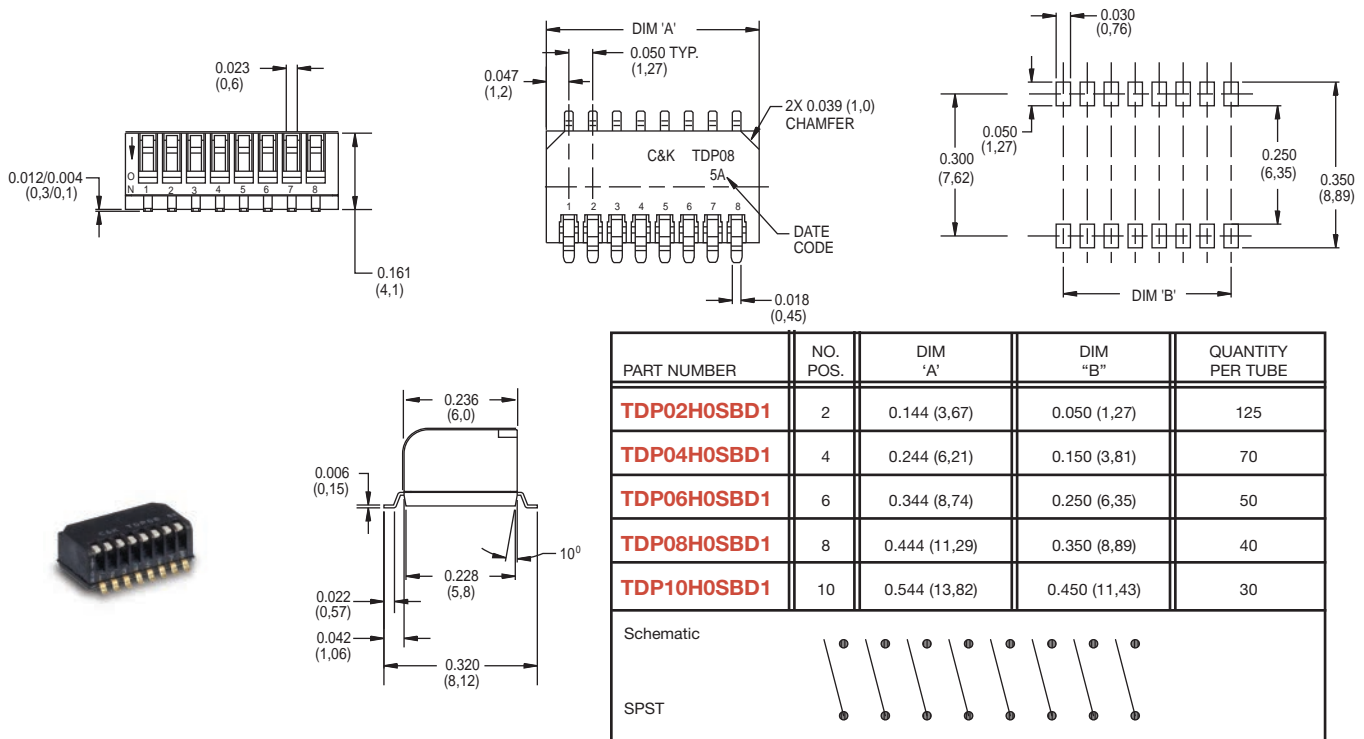


Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

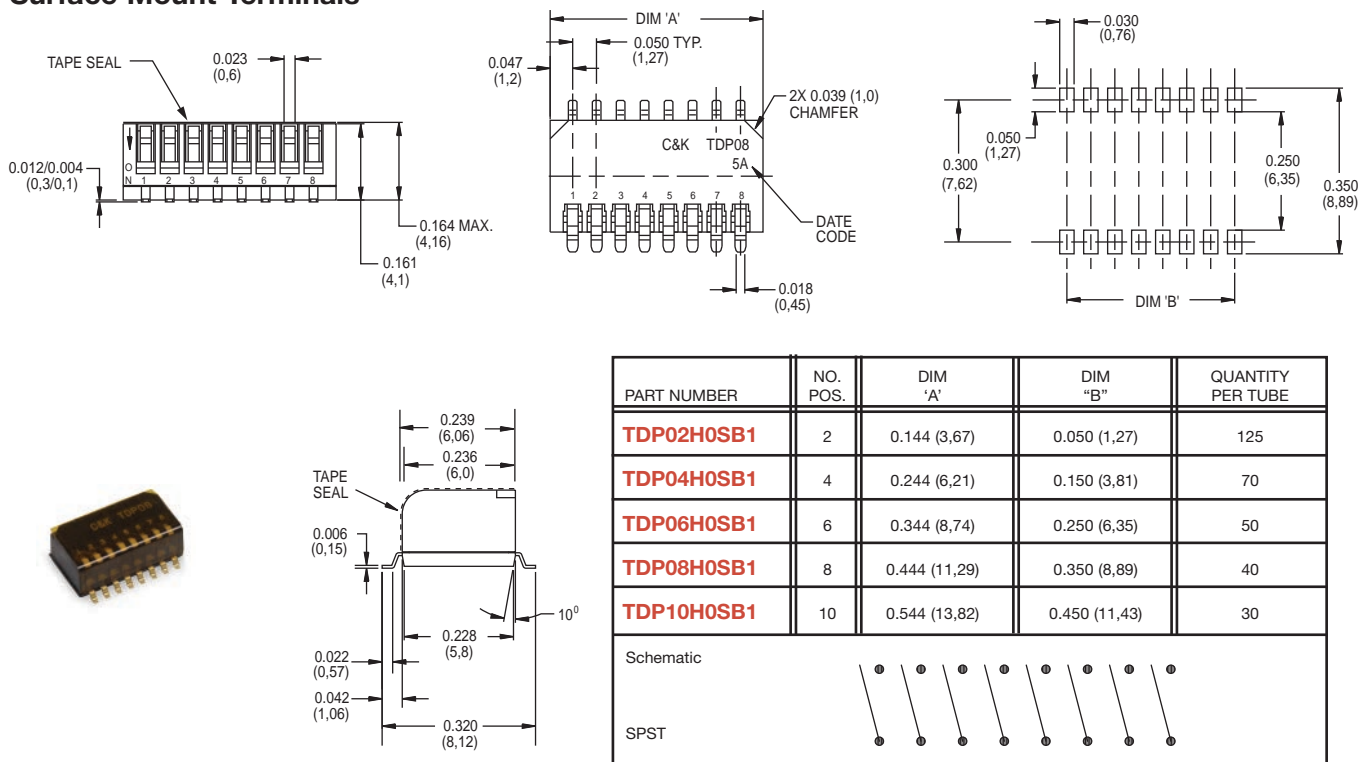


# TDP Series Ultra-miniature Surface Mount Half-pitch Side-Actuated DIP Switches

Flush Actuator-No Top Tape,  
Surface Mount Terminals



Flush Actuator-with Top Tape,  
Surface Mount Terminals



Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

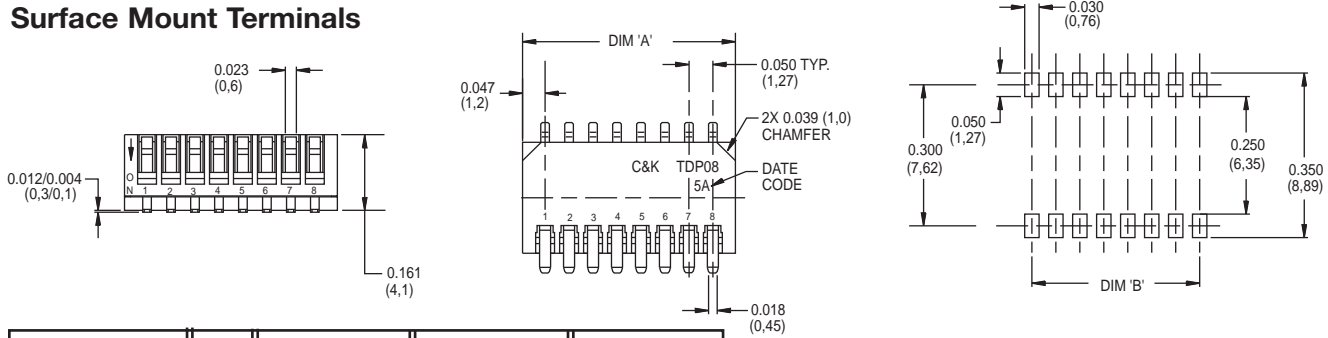


# TDP Series Ultra-miniature Surface Mount Half-pitch Side-Actuated DIP Switches



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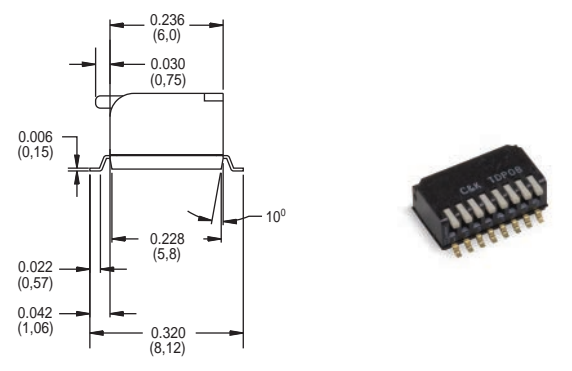
## Extended Actuator-No Top Tape, Surface Mount Terminals



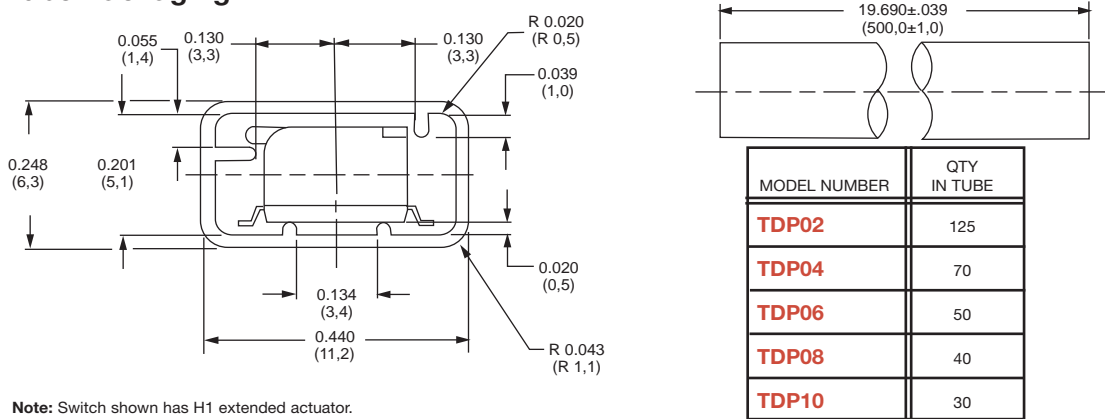
PART NUMBER	NO. POS.	DIM 'A'	DIM "B"	QUANTITY PER TUBE
<b>TDP02H1SBD1</b>	2	0.144 (3,67)	0.050 (1,27)	125
<b>TDP04H1SBD1</b>	4	0.244 (6,21)	0.150 (3,81)	70
<b>TDP06H1SBD1</b>	6	0.344 (8,74)	0.250 (6,35)	50
<b>TDP08H1SBD1</b>	8	0.444 (11,29)	0.350 (8,89)	40
<b>TDP10H1SBD1</b>	10	0.544 (13,82)	0.450 (11,43)	30

Schematic

SPST

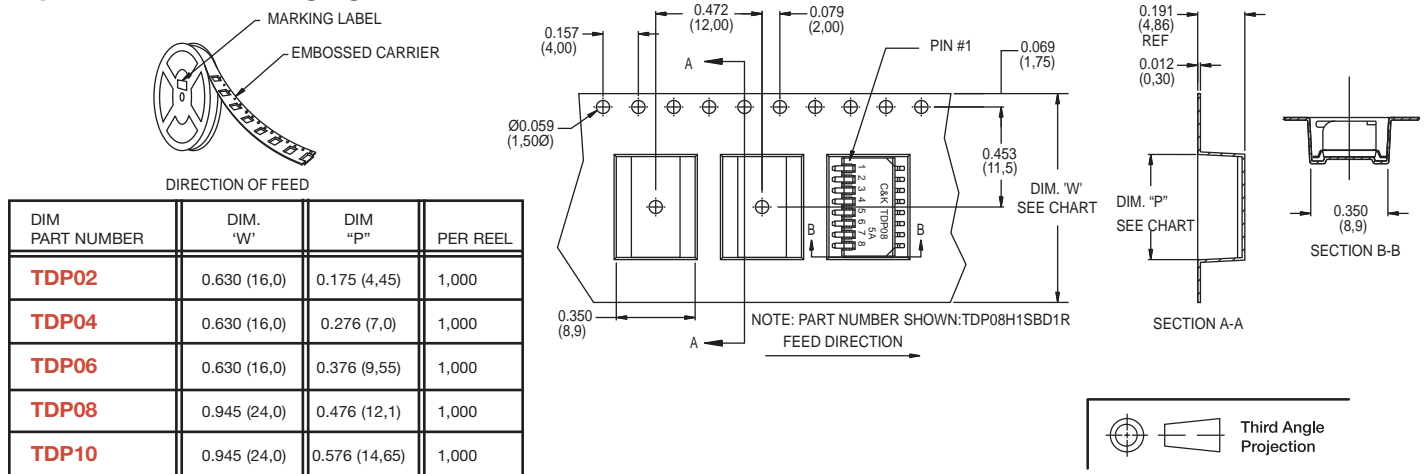


## Tube Packaging



Note: Switch shown has H1 extended actuator.

## Tape and Reel Packaging



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

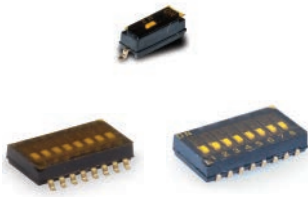
# TDA Series

## Ultra-miniature Surface Mount Half-pitch DIP Switches



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DIP



### Features/Benefits

- Bifurcated contact for increased electrical reliability
- Process sealed for surface mount soldering and washable processing
- RoHS compliant

### Typical Applications

- Hand-held electronic devices
- Portable computer and electronic devices
- Instrumentation and controls

### Specifications

SWITCH FUNCTION: SPST – 1, 2, 4, 6, 8 & 10 positions.  
 CONTACT RATING:  
 24 V DC, 25 mA (switching).  
 50 V DC, 100 mA (steady state).  
 MECHANICAL AND ELECTRICAL LIFE: 1,000 cycles.  
 CONTACT RESISTANCE: 100 mΩ max.  
 INSULATION RESISTANCE: 100 MΩ @ 100 V DC min.  
 DIELECTRIC STRENGTH: 300 V AC min.  
 STORAGE TEMPERATURE: -40°C to 85°C.  
 OPERATING TEMPERATURE: -40°C to 85°C.  
 OPERATING FORCE: 4.9N max.  
 SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

PACKAGING: Switches supplied in rigid dispensing tubes in full tube quantities only, this may affect order quantity. Numbers of switches per tube varies with model. Tape and reel packaging quantity varies with model.

### Materials

CASE & COVER: PPS (UL94V-0)  
 ACTUATOR: LCP (UL94V-0).  
 CONTACTS: Copper alloy, with gold plate over nickel plate.  
 TERMINALS: Copper alloy, with gold flash over nickel plate.  
 All terminals are insert molded.  
 TAPE SEAL: Polyimide.

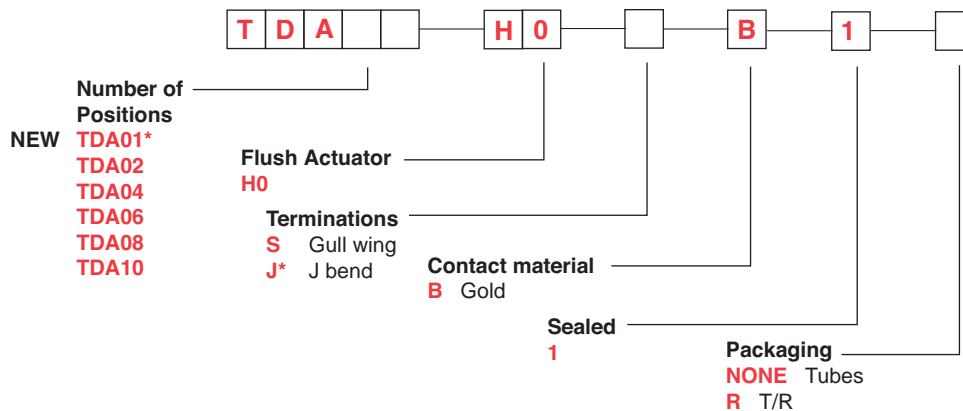
**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

**Note:** All switches supplied in "OFF" position.

### How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position.



\* TDA01H0JB1R is not available, TDA01 only offered in tape & reel



Dimensions are shown: mm  
 Specifications and dimensions subject to change



# TDA Series Ultra-miniature Surface Mount Half-pitch DIP Switches

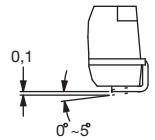
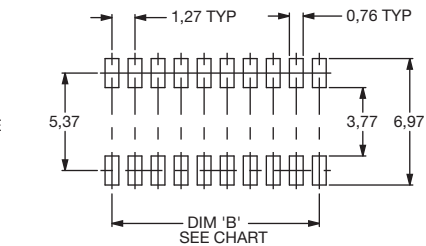
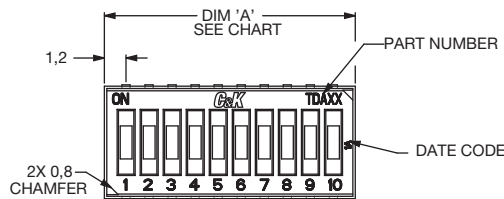
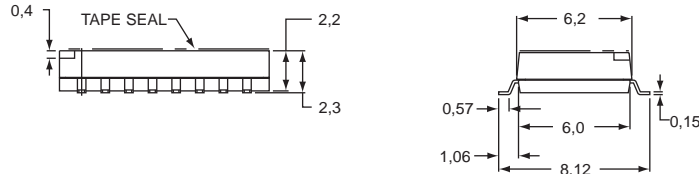
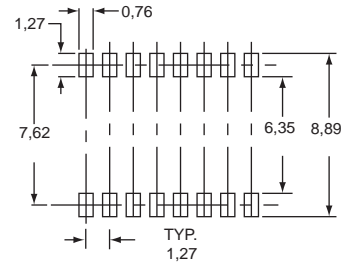
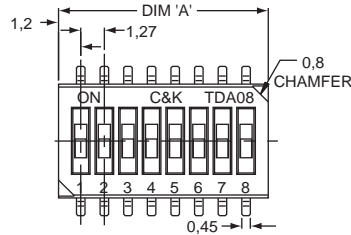


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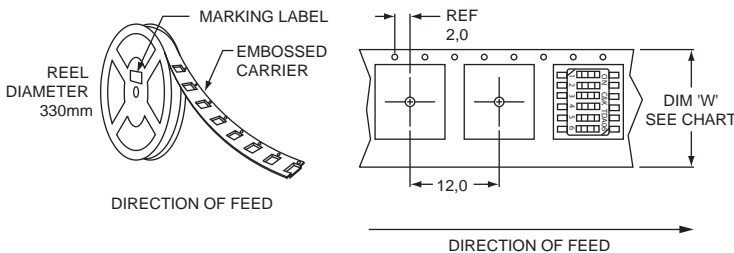
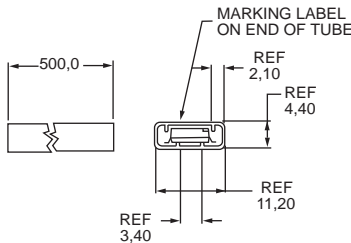
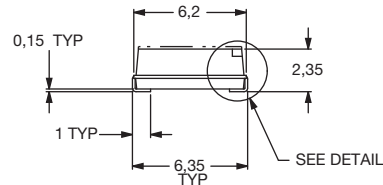
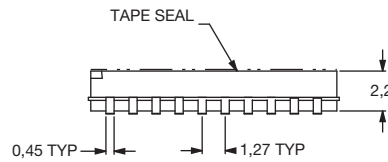
DIP



TDA08H0SB1



TDA10H0JB1



## Tube Package

ROHS PART NUMBER	NO. POS.	DIM. 'A'	DIM. 'B'	QUANTITY PER TUBE
<b>TDA01H0SB1</b>	1	2,40	NA	NA
<b>TDA02H0_B1</b>	2	3,67	1,27	125
<b>TDA04H0_B1</b>	4	6,21	3,81	70
<b>TDA06H0_B1</b>	6	8,75	6,35	50
<b>TDA08H0_B1</b>	8	11,29	8,89	40
<b>TDA10H0_B1</b>	10	13,83	11,43	30

Schematic

SPST

## Tape & Reel Package

ROHS PART NUMBER	NO. POS.	DIM. 'W'	QUANTITY PER REEL
<b>TDA01H0SB1R*</b>	1	16,0	2500
<b>TDA02H0_B1R</b>	2	16,0	2000
<b>TDA04H0_B1R</b>	4	16,0	2000
<b>TDA06H0_B1R</b>	6	16,0	2000
<b>TDA08H0_B1R</b>	8	24,0	2000
<b>TDA10H0_B1R</b>	10	24,0	2000

\* see next page for TDA01 tape & reel drawing



Dimensions are shown: mm  
Specifications and dimensions subject to change



# TDA Series

## Ultra-miniature Surface Mount Half-pitch DIP Switches

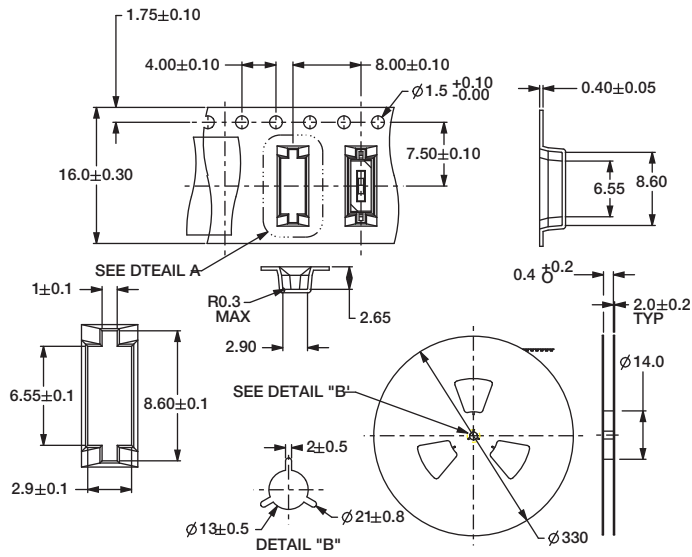


DIP

DIP



TDA01H0SB1R



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# SDA Series Low Profile DIP Switches



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## Features/Benefits

- Low profile design saves space
- Thru-hole and surface mount models
- Tape and reel packaging available
- RoHS compliant

## Typical Applications

- Address switch for industrial controls
- Logic switching for computers and peripherals
- Function controlling for numerous applications



## Specifications

CONTACT RATING: 25 mA @ 24 V DC or 100 mA @ 5 V DC.  
 MECHANICAL AND ELECTRICAL LIFE: 1,000 cycles at rated loads.  
 CONTACT RESISTANCE: 50 mΩ max. initial.  
 INSULATION RESISTANCE: 100 MΩ between terminals.  
 DIELECTRIC WITHSTANDING VOLTAGE: 300 V DC min. for 1 minute.  
 STORAGE TEMPERATURE: -40°C to 85°C.  
 OPERATING TEMPERATURE: -40°C to 85°C.  
 OPERATING FORCE: 800 grams max.  
 SOLDERABILITY: Dip and look solderability testing per C&K spec. #448. Unplated edges of terminals permitted.  
 PACKAGING: Switches supplied in rigid dispensing tubes in full-tube quantities only, this may affect order quantity. Numbers of switches per tube varies with model. Tape and reel packaging also available for surface mount options.

## Materials

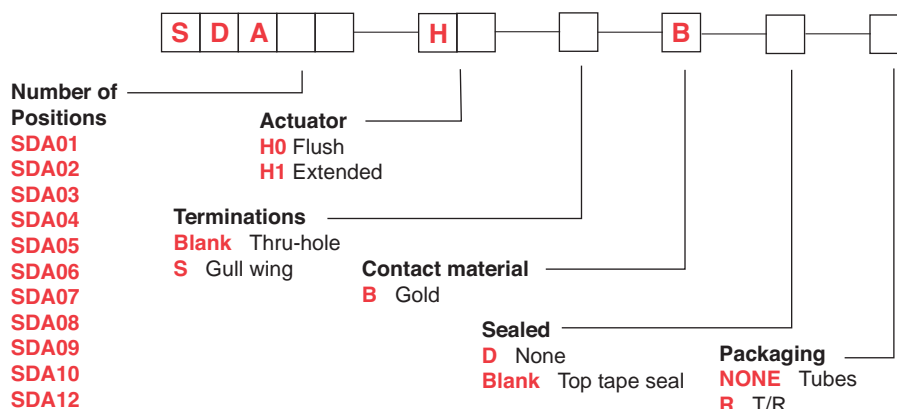
HOUSING: PPS, color black (UL94V-0).  
 COVER: PPS, color black (UL94V-0).  
 ACTUATOR: PA6T (UL94-0)  
 CONTACTS: Gold plated Beryllium copper.  
 TERMINALS: Gold plate over nickel plated brass.  
 TAPE SEAL: Polyimide.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center. For Tin Lead options consult customer service center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position..



Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change





# SDA Series Low Profile DIP Switches



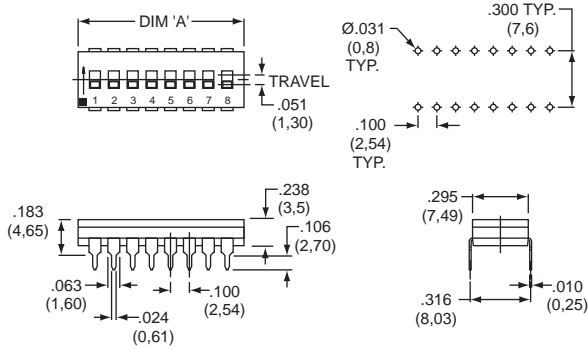
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DIP

## Flush Actuator – No Tape, Thru-hole Terminals

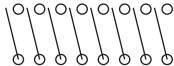


SDA08H0BD



NOTE: SDA 01 options are 4,25mm thick

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SDA01H0BD</b>	1	.178 (4,52)	100
<b>SDA02H0BD</b>	2	.278 (7,06)	60
<b>SDA03H0BD</b>	3	.378 (9,60)	45
<b>SDA04H0BD</b>	4	.476 (12,10)	35
<b>SDA05H0BD</b>	5	.578 (14,68)	30
<b>SDA06H0BD</b>	6	.676 (17,18)	25
<b>SDA07H0BD</b>	7	.778 (19,76)	20
<b>SDA08H0BD</b>	8	.876 (22,26)	20
<b>SDA09H0BD</b>	9	.978 (24,84)	15
<b>SDA10H0BD</b>	10	1.076 (27,34)	15
<b>SDA12H0BD</b>	12	1.279 (32,50)	14

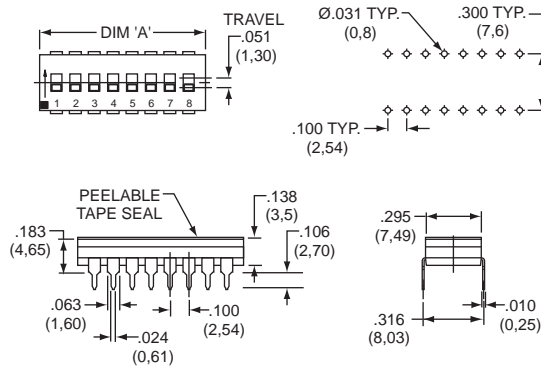
Schematic 

SPST

## Flush Actuator – With Top Tape, Thru-hole Terminals

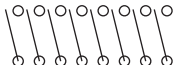


SDA08H0B



NOTE: SDA 01 options are 4,25mm thick

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SDA01H0B</b>	1	.178 (4,52)	100
<b>SDA02H0B</b>	2	.278 (7,06)	60
<b>SDA03H0B</b>	3	.378 (9,60)	45
<b>SDA04H0B</b>	4	.476 (12,10)	35
<b>SDA05H0B</b>	5	.578 (14,68)	30
<b>SDA06H0B</b>	6	.676 (17,18)	25
<b>SDA07H0B</b>	7	.778 (19,76)	20
<b>SDA08H0B</b>	8	.876 (22,26)	20
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<b>SDA10H0B</b>	10	1.076 (27,34)	15
<b>SDA12H0B</b>	12	1.279 (32,50)	14

Schematic 

SPST

# SDA Series Low Profile DIP Switches

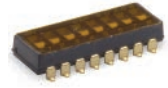
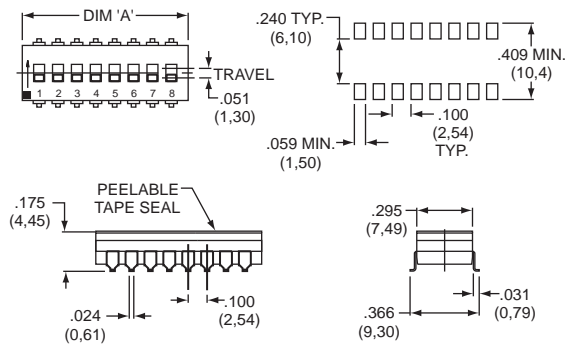


## Flush Actuator – With Top Tape, Surface Mount Terminals

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SDA01H0SB</b>	1	.178 (4,52)	100
<b>SDA02H0SB</b>	2	.278 (7,06)	60
<b>SDA03H0SB</b>	3	.378 (9,60)	45
<b>SDA04H0SB</b>	4	.476 (12,10)	35
<b>SDA05H0SB</b>	5	.578 (14,68)	30
<b>SDA06H0SB</b>	6	.676 (17,18)	25
<b>SDA07H0SB</b>	7	.778 (19,76)	20
<b>SDA08H0SB</b>	8	.876 (22,26)	20
<b>SDA09H0SB</b>	9	.978 (24,84)	15
<b>SDA10H0SB</b>	10	1.076 (27,34)	15
<b>SDA12H0SB</b>	12	1.279 (32,50)	14

Schematic

SPST



SDA08H0SB

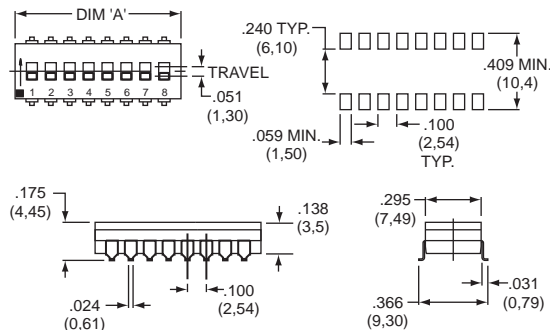
NOTE: SDA 01 options are 4,25mm thick

## Flush Actuator – No Tape, Surface Mount Terminals

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SDA01H0SBD</b>	1	.178 (4,52)	100
<b>SDA02H0SBD</b>	2	.278 (7,06)	60
<b>SDA03H0SBD</b>	3	.378 (9,60)	45
<b>SDA04H0SBD</b>	4	.476 (12,10)	35
<b>SDA05H0SBD</b>	5	.578 (14,68)	30
<b>SDA06H0SBD</b>	6	.676 (17,18)	25
<b>SDA07H0SBD</b>	7	.778 (19,76)	20
<b>SDA08H0SBD</b>	8	.876 (22,26)	20
<b>SDA09H0SBD</b>	9	.978 (24,84)	15
<b>SDA10H0SBD</b>	10	1.076 (27,34)	15
<b>SDA12H0SBD</b>	12	1.279 (32,50)	14

Schematic

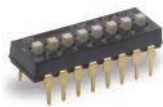
SPST



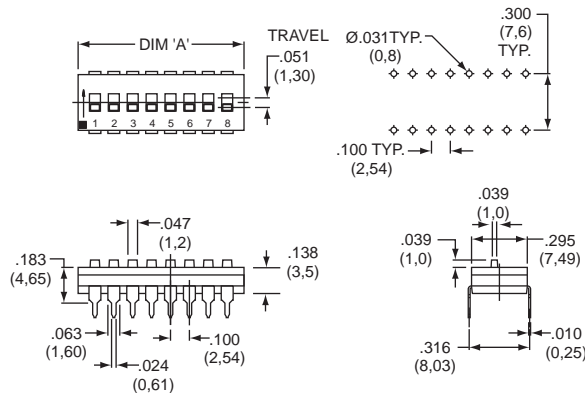
SDA08H0SBD

NOTE: SDA 01 options are 4,25mm thick

## Extended Actuator – No Top Tape, Thru-hole Terminals



SDA08H1BD

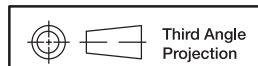


NOTE: SDA 01 options are 4,25mm thick

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SDA01H1BD</b>	1	.178 (4,52)	100
<b>SDA02H1BD</b>	2	.278 (7,06)	60
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<b>SDA08H1BD</b>	8	.876 (22,26)	20
<b>SDA09H1BD</b>	9	.978 (24,84)	15
<b>SDA10H1BD</b>	10	1.076 (27,34)	15
<b>SDA12H1BD</b>	12	1.279 (32,50)	14

Schematic

SPST



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

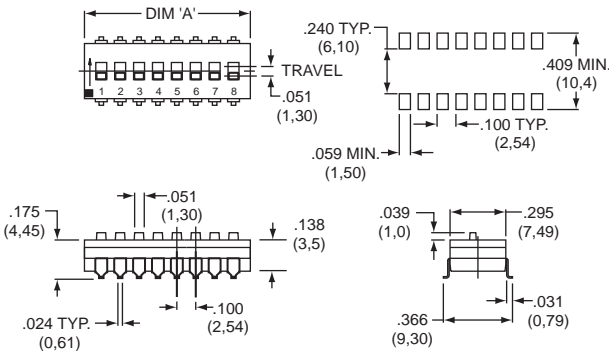


# SDA Series Low Profile DIP Switches

## Extended Actuator – No Top Tape, Surface Mount Terminals



SDA08H1SBD



NOTE: SDA 01 options are 4,25mm thick

ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
SDA01H1SBD	1	.178 (4,52)	100
SDA02H1SBD	2	.278 (7,06)	60
SDA03H1SBD	3	.378 (9,60)	45
SDA04H1SBD	4	.476 (12,10)	35
SDA05H1SBD	5	.578 (14,68)	30
SDA06H1SBD	6	.676 (17,18)	25
SDA07H1SBD	7	.778 (19,76)	20
SDA08H1SBD	8	.876 (22,26)	20
SDA09H1SBD	9	.978 (24,84)	15
SDA10H1SBD	10	1.076 (27,34)	15
SDA12H1SBD	12	1.279 (32,50)	14

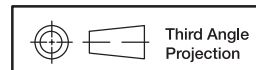
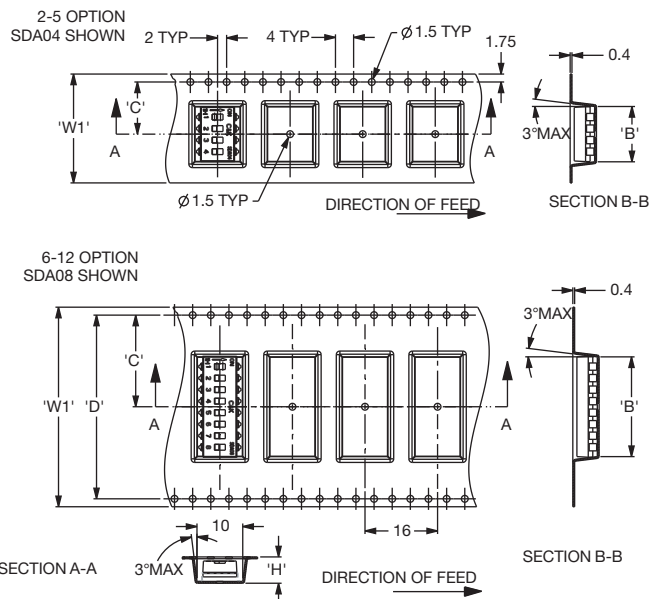
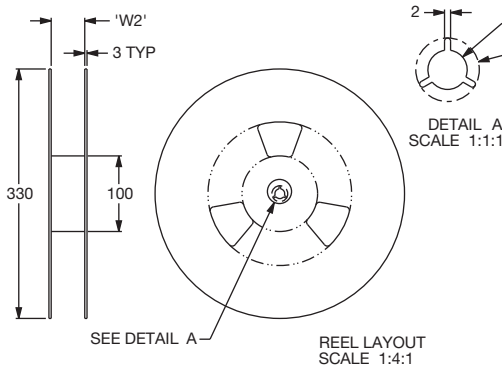
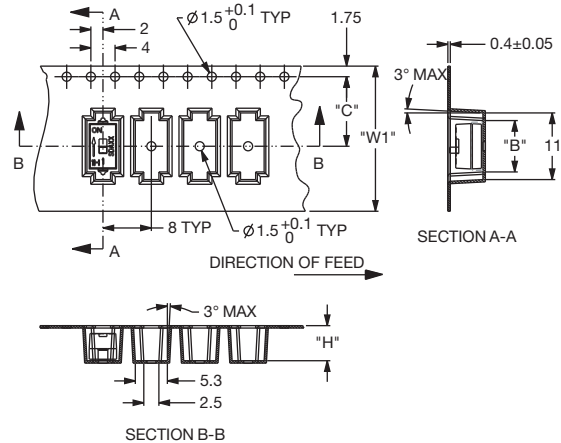
Schematic

SPST

## Tape & Reel Packaging – Surface Mount Options only

MODEL NO. 'S' OPTION	DIM. 'H' (REF.)	DIM. 'W1' (REF.)	DIM. 'W2' (REF.)	DIM. 'B' (REF.)	DIM. 'C' (REF.)	DIM. 'D' (REF.)	QUANTITY PER REEL	
SDA01	H0	5.2	24.0	24.4	8.5	11.5	1500	
	H1	5.8					1450	
SDA02	H0	4.8	24.0	24.4	7.9	11.5	750	
	H1	5.8					700	
SDA03	H0	4.8	24.0	24.4	10.4	11.5	750	
	H1	5.8					700	
SDA04	H0	4.8	24.0	24.4	12.9	11.5	750	
	H1	5.8					700	
SDA05	H0	4.8	24.0	24.4	15.4	11.5	750	
	H1	5.8					700	
SDA06	H0	4.8	32.0	32.4	18.0	14.2	28.4	750
	H1	5.8					28.4	700
SDA07	H0	4.8	32.0	32.4	20.5	14.2	28.4	750
	H1							
NOT CURRENTLY AVAILABLE IN TAPE AND REEL								
SDA08	H0	4.8	44.0	44.4	22.7	20.2	40.4	750
	H1	5.8						700
SDA09	H0	4.8	44.0	44.4	25.5	20.2	40.4	750
	H1	5.8						700
SDA10	H0	4.8	44.0	44.0	28.1	20.2	40.4	750
	H1	5.8						700
SDA12	H0	4.8	44.0	44.4	33.2	20.2	40.4	750
	H1							
NOT CURRENTLY AVAILABLE IN TAPE AND REEL								

SDA01H1SBD OPTION SHOWN



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# SD Series Low Profile DIP Switches



H

DIP

## Features/Benefits

- Low profile design saves space
- Thru-hole and surface mount models
- Tape and reel packaging available
- Sealed with top tape
- RoHS compliant

## Typical Applications

- Address switch for industrial controls
- Logic switching for computers and peripherals
- Function controlling for numerous applications



## Specifications

SWITCH FUNCTION: SPST - 2, 3, 4, 5, 6, 7, 8, 9, 10 & 12 positions

CONTACT RATING:

Carry: 100 mA @ 50 V DC max.

Switch: 0.1 mA @ 5 V DC min to 100 mA @ 25 V DC max.

MECHANICAL AND ELECTRICAL LIFE: 2,000 make-and-break cycles at full load, each circuit.

CONTACT RESISTANCE: Below 50 milliohms typ. initial @ 2-4 V DC, 100mA.

INSULATION RESISTANCE: 10<sup>9</sup> ohms min.

DIELECTRIC STRENGTH: 500 V RMS min. @ sea level between adjacent terminals.

STORAGE TEMPERATURE: -40°C to 85°C.

OPERATING TEMPERATURE: -40°C to 85°C.

OPERATING FORCE: 100-700g initial.

PACKAGING: Thru-hole switches supplied in rigid dispensing tubes in full-tube quantities only: this may effect order quantity. Surface mount switches available in tape and reel packaging by added 'R' to end of part number; 1,000 pieces per reel. Switch position 1 denotes pin number 1. All switch actuators in 'OFF' position, standard.

## Materials

CASE & COVER: (PPA), flame retardant (UL 94V-0)

ACTUATOR: Nylon, flame retardant (UL 94V-0)

CONTACTS: BeCu with gold plate.

TERMINALS: Bright tin-plated brass.

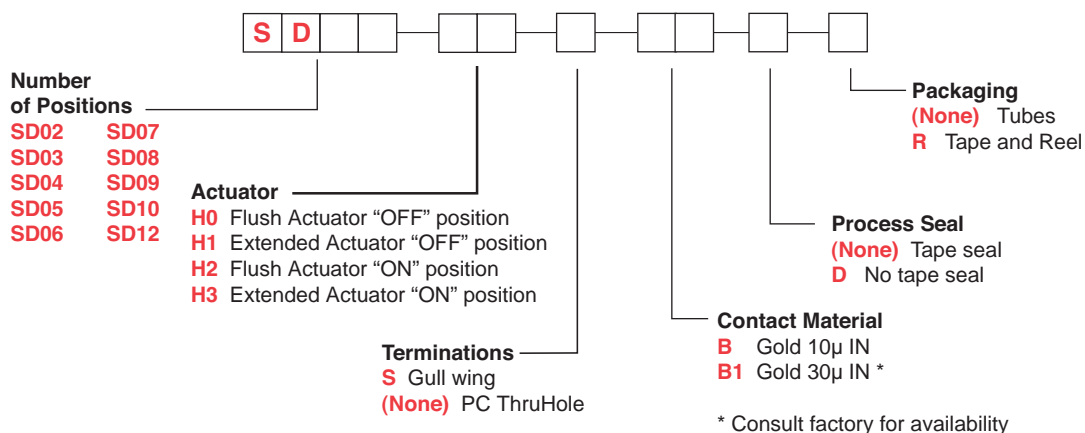
TERMINAL SEAL: All terminals insert molded.

TAPE SEAL: Polyimide.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.



Third Angle  
Projection



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

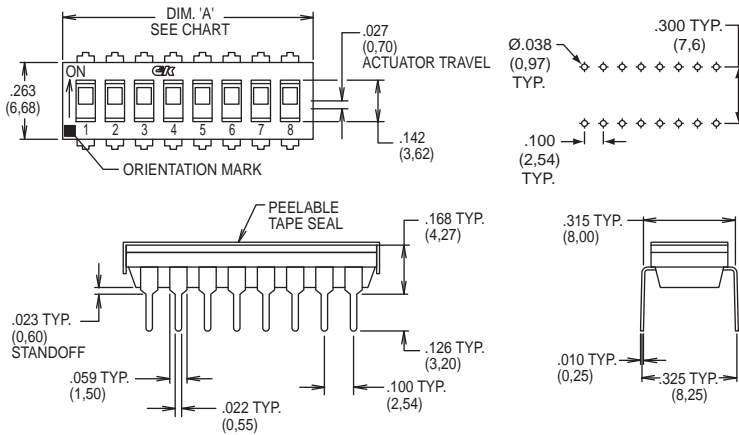
# SD Series Low Profile DIP Switches



DIP H

## Sealed Flush Actuator – With Top Tape, Thru-hole Terminals

Process sealed - withstands soldering and cleaning processes

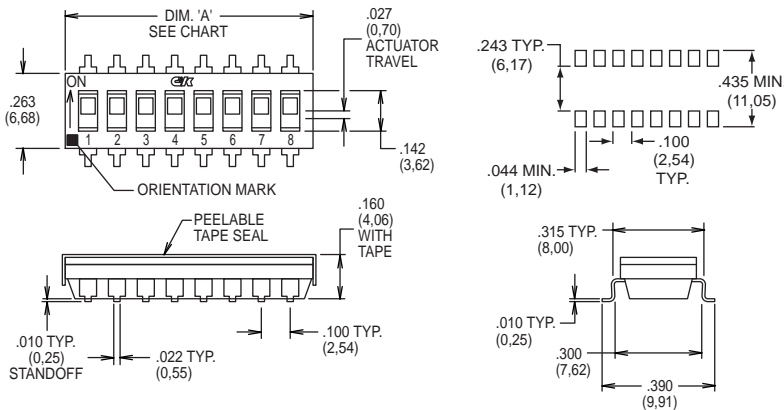


ROHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SD02H0B</b>	2	.258 (6,55)	85
<b>SD03H0B</b>	3	.358 (9,09)	60
<b>SD04H0B</b>	4	.458 (11,63)	45
<b>SD05H0B</b>	5	.558 (14,17)	40
<b>SD06H0B</b>	6	.658 (16,71)	30
<b>SD07H0B</b>	7	.758 (19,25)	25
<b>SD08H0B</b>	8	.858 (21,79)	25
<b>SD09H0B</b>	9	.958 (24,33)	20
<b>SD10H0B</b>	10	1.058 (26,87)	20
<b>SD12H0B</b>	12	1.258 (31,95)	15



Table applicable to "H0" and "H2" actuator options.

## Sealed Flush Actuator – With Top Tape, Surface Mount Terminals

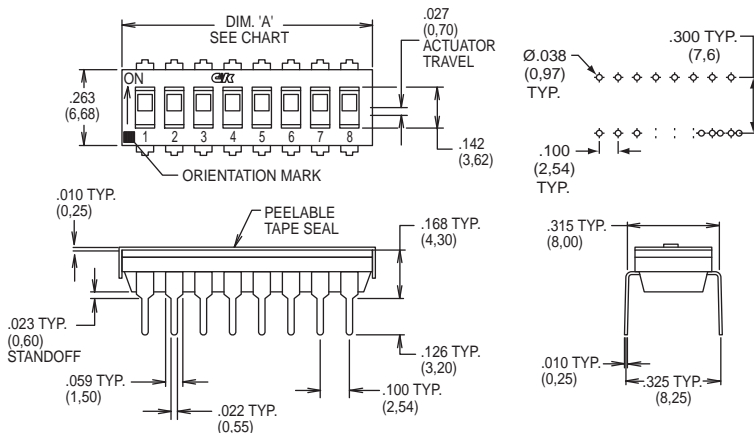


RoHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SD02H0SB</b>	2	.258 (6,55)	85
<b>SD03H0SB</b>	3	.358 (9,09)	60
<b>SD04H0SB</b>	4	.458 (11,63)	45
<b>SD05H0SB</b>	5	.558 (14,17)	40
<b>SD06H0SB</b>	6	.658 (16,71)	30
<b>SD07H0SB</b>	7	.758 (19,25)	25
<b>SD08H0SB</b>	8	.858 (21,79)	25
<b>SD09H0SB</b>	9	.958 (24,33)	20
<b>SD10H0SB</b>	10	1.058 (26,87)	20
<b>SD12H0SB</b>	12	1.258 (31,95)	15



Table applicable to "H0" and "H2" actuator options.

## Sealed Extended Actuator – With Top Tape, Thru-hole Terminals



RoHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
<b>SD02H1B</b>	2	.258 (6,55)	85
<b>SD03H1B</b>	3	.358 (9,09)	60
<b>SD04H1B</b>	4	.458 (11,63)	45
<b>SD05H1B</b>	5	.558 (14,17)	40
<b>SD06H1B</b>	6	.658 (16,71)	30
<b>SD07H1B</b>	7	.758 (19,25)	25
<b>SD08H1B</b>	8	.858 (21,79)	25
<b>SD09H1B</b>	9	.958 (24,33)	20
<b>SD10H1B</b>	10	1.058 (26,87)	20
<b>SD12H1B</b>	12	1.258 (31,95)	15



Table applicable to "H1" and "H3" actuator options.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# SD Series Low Profile DIP Switches

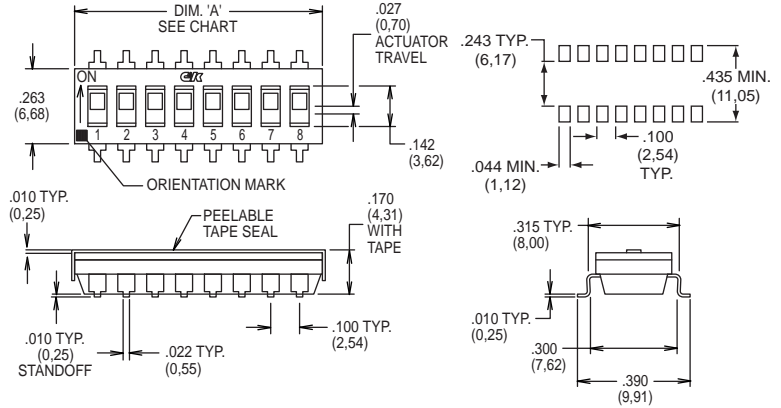


## Sealed Extended Actuator – With Top Tape, Surface Mount Terminals

RoHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER TUBE
SD02H1SB	2	.258 (6,55)	85
SD03H1SB	3	.358 (9,09)	60
SD04H1SB	4	.458 (11,63)	45
SD05H1SB	5	.558 (14,17)	40
SD06H1SB	6	.658 (16,71)	30
SD07H1SB	7	.758 (19,25)	25
SD08H1SB	8	.858 (21,79)	25
SD09H1SB	9	.958 (24,33)	20
SD10H1SB	10	1.058 (26,87)	20
SD12H1SB	12	1.258 (31,95)	15



Table applicable to "H1" and "H3" actuator options.

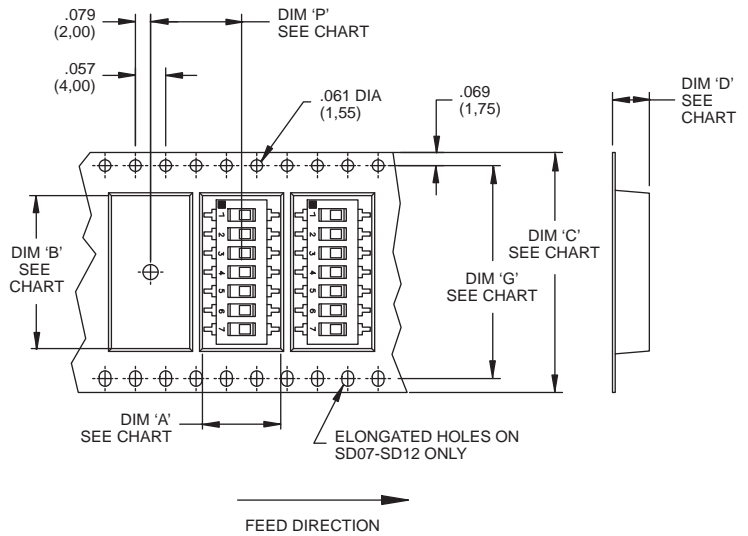


## TAPE & REEL PACKAGING – SURFACE MOUNT OPTIONS ONLY

RoHS PART NUMBER	NO. POS.	DIM. 'A'	QUANTITY PER REEL
SD02H0SBR	2	.258 (6,55)	1000
SD03H0SBR	3	.358 (9,09)	1000
SD04H0SBR	4	.458 (11,63)	1000
SD05H0SBR	5	.558 (14,17)	1000
SD06H0SBR	6	.658 (16,71)	1000
SD07H0SBR	7	.758 (19,25)	1000
SD08H0SBR	8	.858 (21,79)	1000
SD09H0SBR	9	.958 (24,33)	1000
SD10H0SBR	10	1.058 (26,87)	1000
SD12H0SBR	12	1.258 (31,95)	1000



Table applicable to "H0" and "H2" actuator options.



SWITCH NO.	DIM 'A' POCKET LENGTH @ BOTTOM	DIM 'B' POCKET LENGTH @ BOTTOM	DIM 'C' TAPE WIDTH	DIM 'D' POCKET DEPTH	DIM 'G' SPROCKET HOLE SPACING	DIM 'P' PITCH BETWEEN POCKETS
SD02	.413(10,5)	.315(8,0)	.630(16,0)	.177(4,5)	N/A	.472(12,0)
SD03	.406(10,3)	.406(10,3)	.630(16,0)	.177(4,5)	N/A	.472(12,0)
SD04	.429(10,9)	.476(12,1)	.954(24,0)	.177(4,5)	N/A	.472(12,0)
SD05	.406(10,3)	.602(15,3)	.954(24,0)	.177(4,5)	N/A	.472(12,0)
SD06	.406(10,3)	.701(17,8)	.954(24,0)	.177(4,5)	N/A	.472(12,0)
SD07	.406(10,3)	.803(20,4)	1.260(32,0)	.177(4,5)	1.118(28,4)	.472(12,0)
SD08	.406(10,3)	.854(21,7)	1.732(44,0)	.177(4,5)	1.591(40,4)	.472(12,0)
SD09	.406(10,3)	1.028(26,1)	1.732(44,0)	.177(4,5)	1.591(40,4)	.472(12,0)
SD10	.406(10,3)	1.055(26,8)	1.732(44,0)	.177(4,5)	1.591(40,4)	.472(12,0)
SD12	.406(10,3)	1.303(33,1)	1.732(44,0)	.177(4,5)	1.591(40,4)	.472(12,0)

### Reel Information

Outside diameter 13.00 (333,0)  
 Pilot hole .512 (13,0)



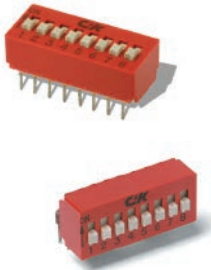
Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change



# BD Series Standard Profile DIP Switches



DIP



## Features/Benefits

- Traditional full profile DIP switch
- Extended actuator for easy actuation
- Open bottom construction allows for solder washing without the need for tape seal
- RoHS compliant

## Typical Applications

- Address switch for industrial controls
- Logic switching for computers and peripherals
- Function controlling for numerous applications

## Specifications

SWITCH FUNCTION: SPST - 1 thru 12 position available (except 11 position).

CONTACT RATING:

Carry: 100 mA max. @ 50 V DC.

Switch: 100 mA max. @ 5 V DC or 25 mA max. @ 25 V DC.

MECHANICAL AND ELECTRICAL LIFE: 10,000 make-and-break cycles at full load, each circuit.

CONTACT RESISTANCE: Below 50 milliohms typ. initial

@ 2-4 V DC 100mA.

INSULATION RESISTANCE: 10<sup>9</sup> ohms min.

DIELECTRIC STRENGTH: 500 V RMS min. @ sea level between adjacent terminals.

CAPACITANCE: 5pF max. between adjacent terminals.

STORAGE & OPERATING TEMPERATURE: -40°C to 85°C.

SHOCK: Withstands 20g 11 ms sawtooth waveform with no contact opening greater than 10 microseconds.

VIBRATION: No contact opening greater than 10 microseconds and no contact closure when exposed to vibration .06 in DA or 5g, whichever is less, from 10 to 55 Hz, and 10g from 55 to 500 Hz.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

PACKAGING: Switches supplied in rigid dispensing tubes in full-tube quantities only: this may effect order quantity. Number of switches per tube varies with model. Switch position 1 denotes pin number 1. All switch actuators in 'OFF' position, standard.

## Materials

CASE & COVER: Glass filled polyester (PBT), flame retardant (UL 94V-0).

ACTUATOR: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)

CONTACTS: Gold over nickel over phosphor bronze.

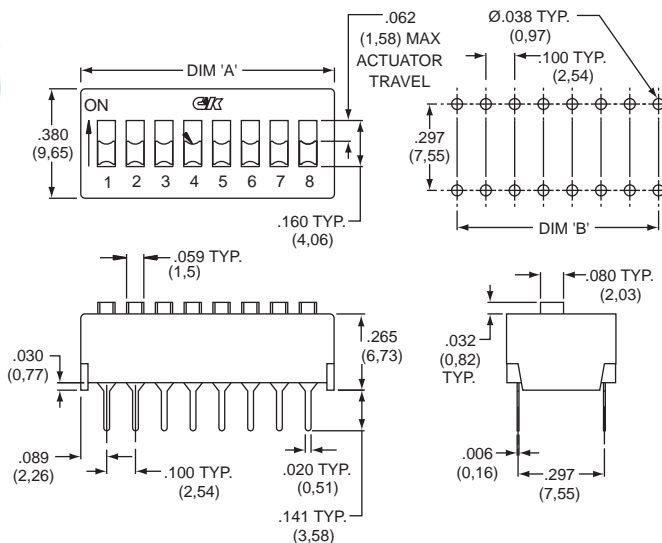
TERMINALS: Matte-tin over nickel over phosphor bronze.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Vertical Full Profile DIP

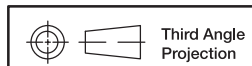


BD08



PART NUMBER	NO.POS.	DIM. 'A'	DIM. 'B'	QUANTITY PER TUBE
<b>BD01</b>	1	.180 (4,57)	NA	115
<b>BD02</b>	2	.280 (7,11)	.100 (2,54)	74
<b>BD03</b>	3	.380 (9,65)	.200 (5,08)	54
<b>BD04</b>	4	.480 (12,19)	.300 (7,62)	43
<b>BD05</b>	5	.580 (14,73)	.400 (10,16)	35
<b>BD06</b>	6	.680 (17,27)	.500 (12,75)	30
<b>BD07</b>	7	.780 (19,81)	.600 (15,24)	26
<b>BD08</b>	8	.880 (22,35)	.700 (17,78)	23
<b>BD09</b>	9	.980 (24,89)	.800 (20,32)	21
<b>BD10</b>	10	1.080 (27,43)	.900 (22,86)	19
<b>BD12</b>	12	1.280 (32,51)	1.100 (27,94)	16

Schematic  
SPST



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



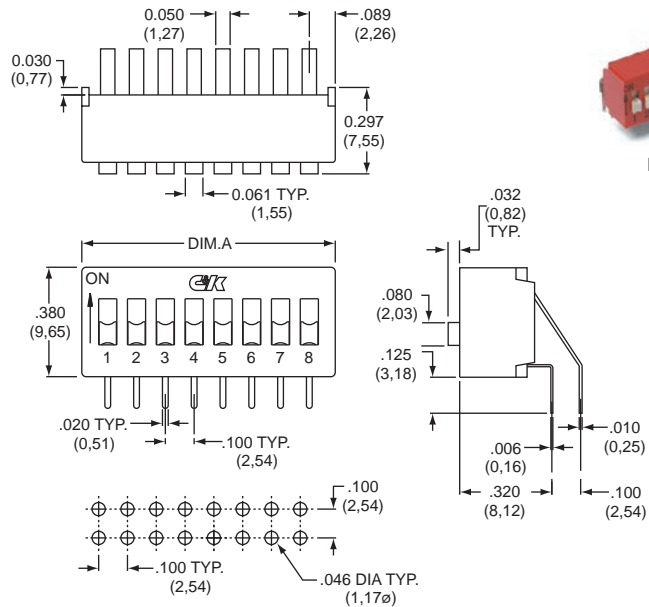
# BD Series Standard Profile DIP Switches

## Open Base and AV Right Angle Terminal Style

PART NUMBER	NO.POS.	DIM. 'A'	QUANTITY PER TUBE
<b>BD02AV</b>	2	.280 (7,11)	72
<b>BD03AV</b>	3	.380 (9,65)	52
<b>BD04AV</b>	4	.480 (12,19)	42
<b>BD05AV</b>	5	.580 (14,73)	35
<b>BD06AV</b>	6	.680 (17,27)	29
<b>BD07AV</b>	7	.780 (19,81)	26
<b>BD08AV</b>	8	.880 (22,35)	23
<b>BD09AV</b>	9	.980 (24,89)	20
<b>BD10AV</b>	10	1.080 (27,43)	18
<b>BD12AV</b>	12	1.280 (32,51)	15

Schematic

SPST



BD08AV



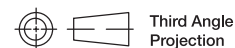
H

DIP

## Installation, Soldering and Cleaning

All BD Series Standard Profile DIP Switches can be hand soldered or machine soldered without the use of boot, caps, tapes or special attention. Open base washable models have unique design, allowing solvent cleaners and water/detergent solutions to flush and clean the electrical contacts of the contaminants and fluxes. For best results, follow these directions:

- 1) Wave soldering recommended at 500° F (260°C) solder temperature.
- 2) Hand solder using 30 watt small tip iron controlled at 500° F (260°C), 10 seconds max./terminal.
- 3) Open base washable models: Clean flux using forced rinse, high agitation or triple bath cleaning method.  
DO NOT mask or cover switch in any way during cleaning. Switch is designed for easy solvent flush out.
- 4) All switch actuators must be in 'OFF' position during soldering and cleaning processes.



Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change





# BPA Series Side Actuated DIP Switches

10  
9  
8  
7  
6  
5  
4  
3  
2  
1

H

DIP



## Features/Benefits

- Side actuated contacts
- Available in thru-hole or SMT models
- High pressure contact system does not require tape seal for washing
- RoHS compliant & compatible

## Typical Applications

- Address switch for industrial controls
- Logic switching for computers and peripherals
- Function controlling for numerous applications

## Specifications

SWITCH FUNCTION: 1 thru 10 and 12 position available.  
 CONTACT RATING: 100 mA max. @ 5 V DC or 25 mA max. @ 24 V DC.  
 MECHANICAL AND ELECTRICAL LIFE: 1,000 cycles min. @ 5 V DC 10mA.  
 CONTACT RESISTANCE: 50 milliohms initial max.  
 INSULATION RESISTANCE: 100 V DC 100 megohms min.  
 DIELECTRIC WITHSTAND VOLTAGE: 300 V AC for 1 minute.  
 STORAGE TEMPERATURE: -40°C to 85°C.  
 OPERATING TEMPERATURE: -20°C to 85°C.  
 OPERATING FORCE: 800 grams max.  
 SOLDERABILITY: Flow solderable and washable (soldering: 260°C for 10 sec. max.)

PACKAGING: Switches supplied in rigid dispensing tubes in full-tube quantities only, this may affect order quantity. Numbers of switches per tube varies with model. Tape and reel packaging available for SMT options.

## Materials

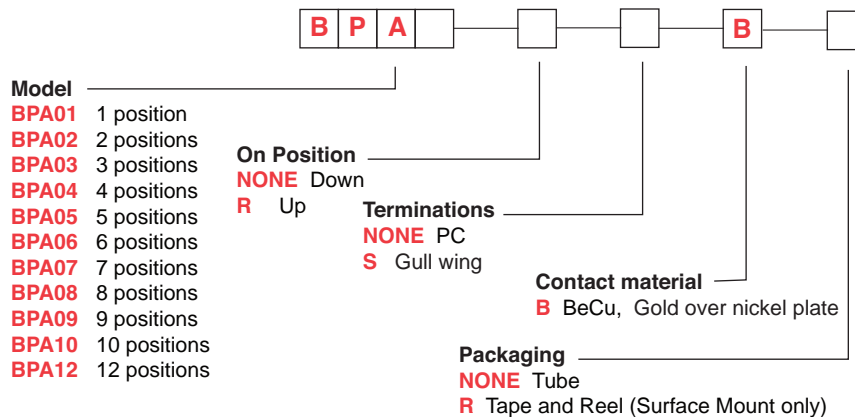
HOUSING: PPS, color black (UL94V-0).  
 COVER: PPS, color black (UL94V-0).  
 ACTUATOR: PA-6T UL94V-0).  
 CONTACTS: Beryllium Copper with Gold over Nickel plate.  
 TERMINALS: Brass, Gold over Nickel plate.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position.

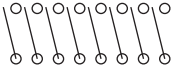


Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

# BPA Series Side Actuated DIP Switches

## Side Actuator – Thru-hole Terminals

ROHS PART NUMBER	NO. POS.	DIM. 'A'	DIM. 'B'	QUANTITY PER TUBE
<b>BPA01B</b>	1	.176 (4,48)	N/A	100
<b>BPA02B</b>	2	.276 (7,0)	.100 (2,54)	60
<b>BPA03B</b>	3	.376 (9,6)	.200 (5,08)	45
<b>BPA04B</b>	4	.476 (12,1)	.300 (7,62)	35
<b>BPA05B</b>	5	.575 (14,6)	.400 (10,16)	30
<b>BPA06B</b>	6	.677 (17,2)	.500 (12,70)	25
<b>BPA07B</b>	7	.776 (19,7)	.600 (15,24)	20
<b>BPA08B</b>	8	.878 (22,3)	.700 (17,78)	20
<b>BPA09B</b>	9	.976 (24,8)	.800 (20,32)	15
<b>BPA10B</b>	10	1.075 (27,3)	.900 (22,86)	15
<b>BPA12B</b>	12	1.280 (32,5)	1.100 (27,94)	14

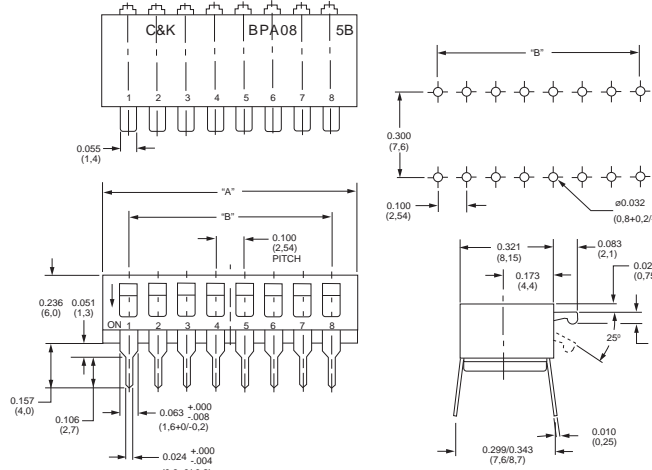
Schematic 

SPST

**NOTE:** Reverse throw available, contact C&K for P/N and quote.

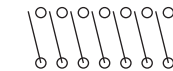


BPA08B



## Side Actuator – Surface Mount Terminals

ROHS PART NUMBER	NO. POS.	DIM. 'A'	DIM. 'B'	QUANTITY PER TUBE
<b>BPA01SB</b>	1	.176 (4,48)	N/A	100
<b>BPA02SB</b>	2	.276 (7,0)	.100 (2,54)	60
<b>BPA03SB</b>	3	.376 (9,6)	.200 (5,08)	45
<b>BPA04SB</b>	4	.476 (12,1)	.300 (7,62)	35
<b>BPA05SB</b>	5	.575 (14,6)	.400 (10,16)	30
<b>BPA06SB</b>	6	.677 (17,2)	.500 (12,70)	25
<b>BPA07SB</b>	7	.776 (19,7)	.600 (15,24)	20
<b>BPA08SB</b>	8	.878 (22,3)	.700 (17,78)	20
<b>BPA09SB</b>	9	.976 (24,8)	.800 (20,32)	15
<b>BPA10SB</b>	10	1.075 (27,3)	.900 (22,86)	15
<b>BPA12SB</b>	12	1.280 (32,5)	1.100 (27,94)	14

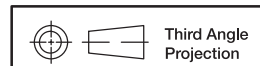
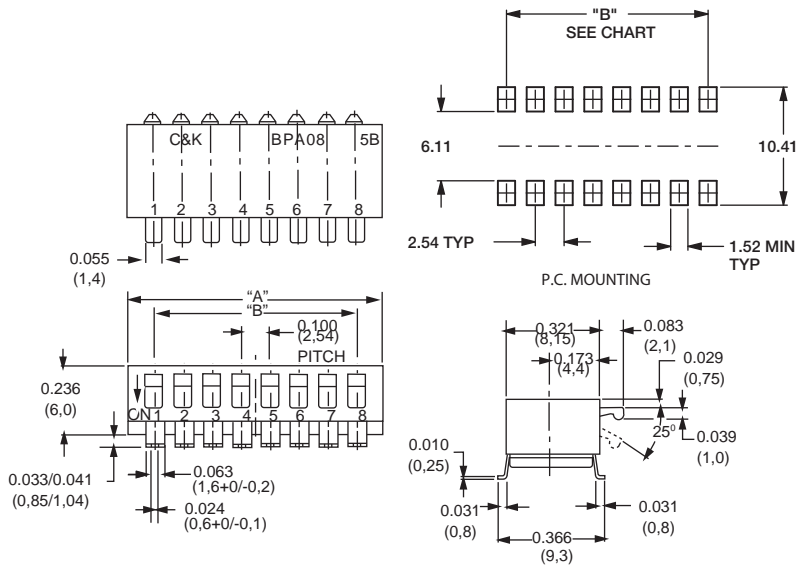
Schematic 

SPST

**NOTE:** Tape and reel packaging available by adding "R" to end of project number.



BPA08SB



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# BPA Series Side Actuated DIP Switches

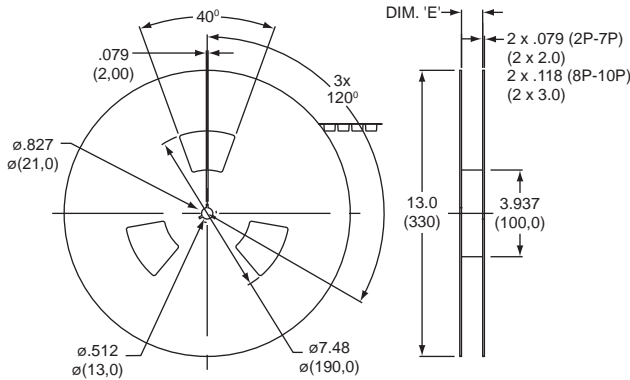


DIP H

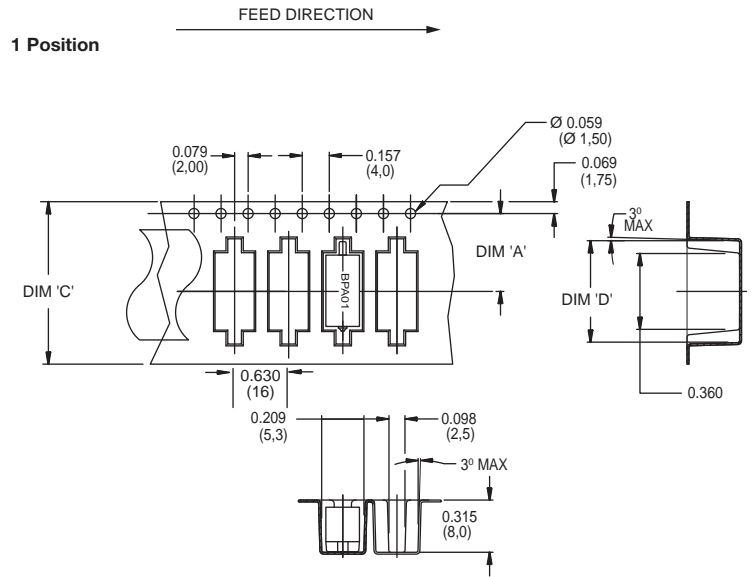
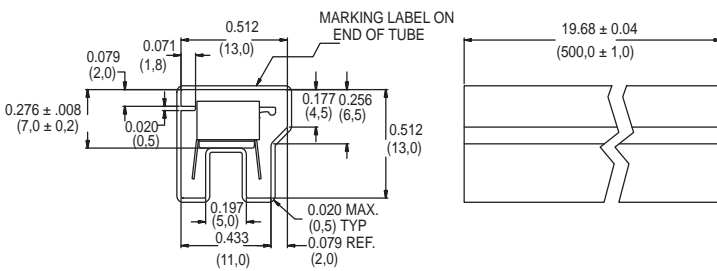
## Tape & Reel Packaging – Surface Mount Options Only

QTY/ REEL	POLES	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'	DIM. 'E'
500	1	.453 (11,5)	—	.945 (24,0)	.530 (13,45)	.960 (24,4)
500	2	.453 (11,5)	—	.945 (24,0)	.311 (7,9)	.960 (24,4)
500	3	.453 (11,5)	—	.945 (24,0)	.409 (10,4)	.960 (24,4)
500	4	.453 (11,5)	—	.945 (24,0)	.508 (12,9)	.960 (24,4)
500	5	.453 (11,5)	—	.945 (24,0)	.606 (15,4)	.960 (24,4)
500	6	.559 (14,2)	1.118 (28,4)	1.260 (32,0)	.709 (18,0)	1.275 (32,4)
500	7	.559 (14,2)	1.118 (28,4)	1.260 (32,0)	.807 (20,5)	1.275 (32,4)
500	8	.795 (20,2)	1.590 (40,4)	1.732 (44,0)	.894 (22,7)	1.748 (44,4)
500	9	.795 (20,2)	1.590 (40,4)	1.732 (44,0)	1.004 (25,5)	1.748 (44,4)
500	10	.795 (20,2)	1.590 (40,4)	1.732 (44,0)	1.106 (28,1)	1.748 (44,4)
500	12	.795 (20,2)	1.590 (40,4)	1.732 (44,0)	1.311 (33,3)	1.748 (44,4)

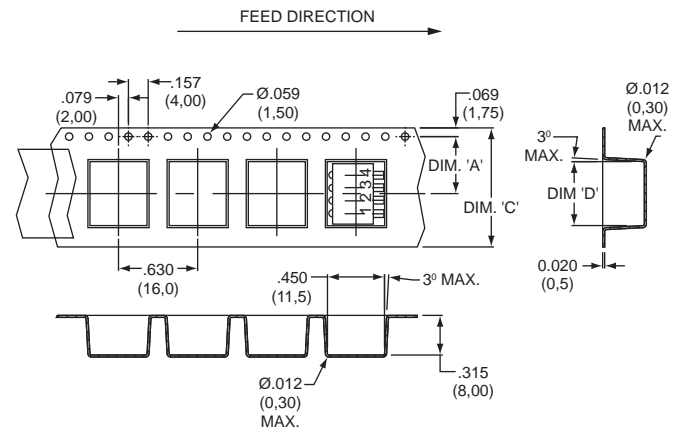
Note: For tape and reel packaging, add 'R' to end of part number.



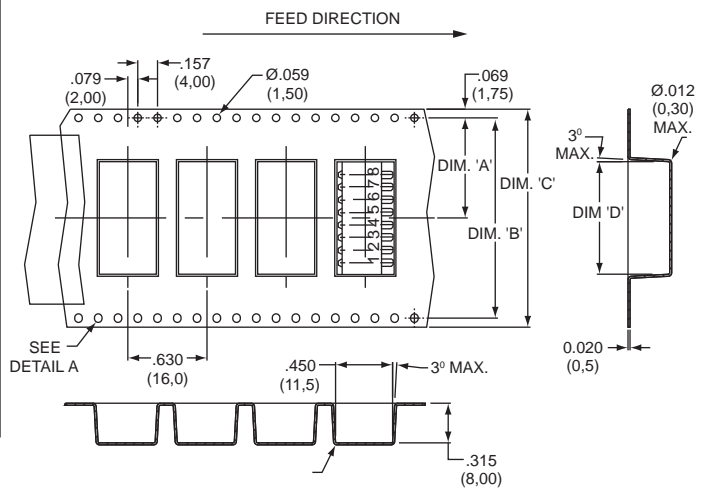
## Tube Packaging



## 2, 3, 4 & 5 Positions



## 6, 7, 8, 9, 10 & 12 Positions



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# TDD Series Jumper Switch



H

DIP

## Features/Benefits

- **Bifurcated contact for increased electrical reliability**
- **Process sealed for surface mount soldering and washable processing**
- **RoHS compliant**

## Typical Applications

- **Hand-held electronic devices**
- **Portable computer and electronic devices**
- **Instrumentation and controls**
- **Inverters**



## Specifications

CONTACT RATING: 25 mA @ 24 V DC (switching) or  
100 mA @ 50 V DC (steady state).

MECHANICAL AND ELECTRICAL LIFE: 200 cycles at rated loads.

CONTACT RESISTANCE: 100 mΩ max. initial. @ 2 V DC /10 mA

INSULATION RESISTANCE: 100 MΩ @ 100 V DC min.

DIELECTRIC STRENGTH: 300 V AC /minute

STORAGE TEMPERATURE: -40°C to 85°C.

OPERATING TEMPERATURE: -30°C to 85°C.

OPERATING FORCE: 4.9 N max.

SOLDERABILITY: Per MIL-STD-202F method 208D, or

EIA RS-186E method 9 (1 hour steam aging).

PACKAGING: 1,000 pieces tape & reel

## Materials

CASE AND COVER: PPS, color black (UL94V-0).

ACTUATOR: LCP (UL94-0)

CONTACTS: Copper alloy with gold plate over nickel plate

TERMINALS (INSERT MOLDED):

Copper alloy gold flash over nickel plate

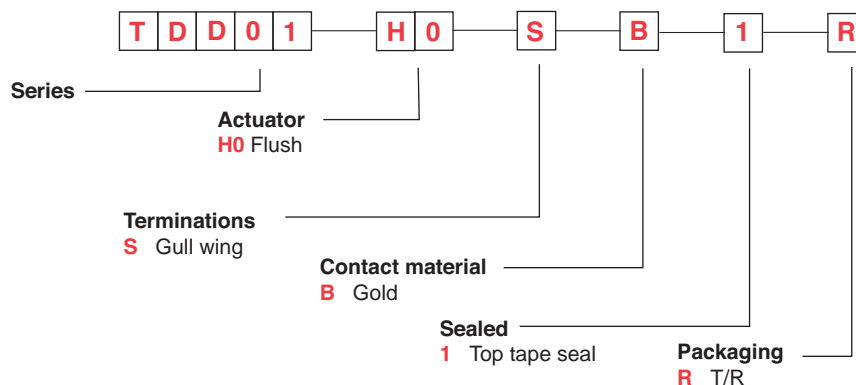
TAPE SEAL: Polyamide

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center. For Tin Lead options consult customer service center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position..



Third Angle Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

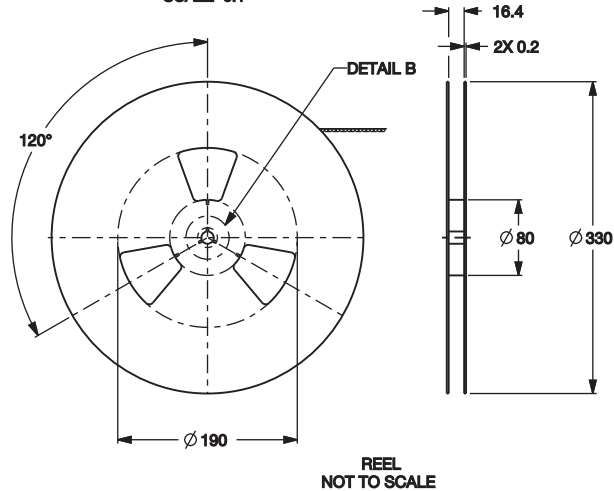
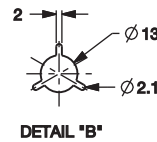
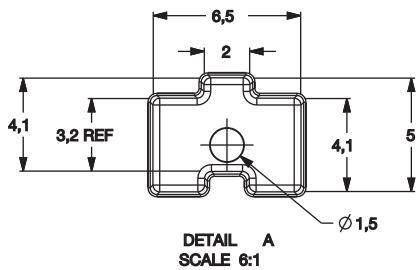
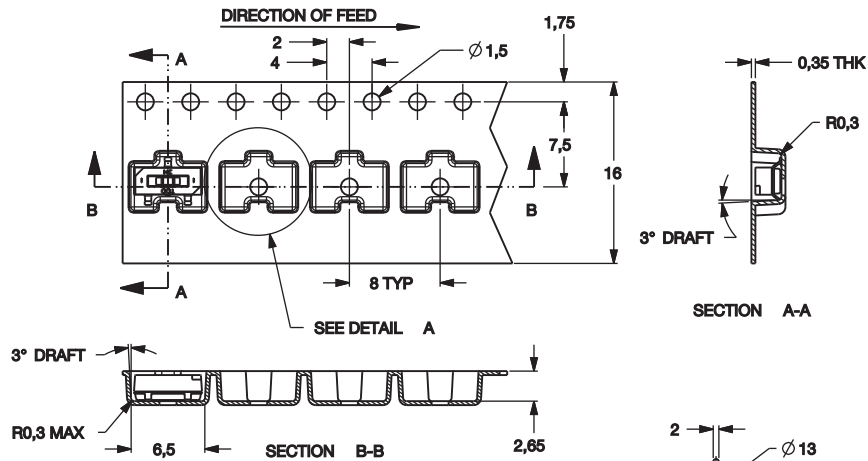
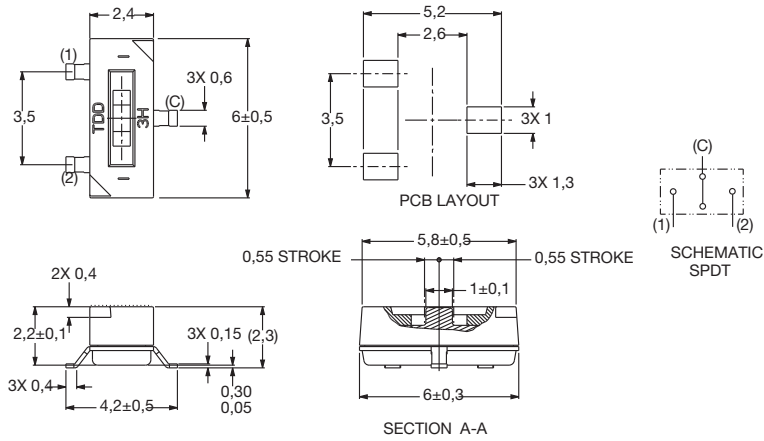


# TDD Series Jumper Switch



DIP

H



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# SPA Series Single In-line Package Switches



H

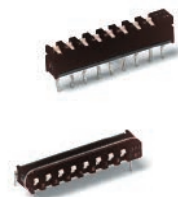
DIP

## Features/Benefits

- Thin Single In-line Packaging saves PCB space
- Retention feature holds part to PCB prior to soldering
- Available in vertical or right angle models
- High pressure contact system does not require tape sealing
- RoHS compliant

## Typical Applications

- Address switch for industrial controls
- Logic switching for computers and peripherals
- Function controlling for numerous applications



## Specifications

### CONTACT RATING:

Carry: 10 mA @ 5VDC

Switching: 0.1 mA @ 0.1m VDC min.

MECHANICAL AND ELECTRICAL LIFE: 1,000 cycles min.

CONTACT RESISTANCE: 50 mΩ max. @ 20 V DC 10mA.

INSULATION RESISTANCE: 100 MΩ min. @ 100 V DC.

DIELECTRIC STRENGTH: 1 minute @ 300 V AC.

CAPACITANCE: 5pF max. between adjacent terminals.

OPERATING TEMPERATURE: -30°C to 60°C.

STORAGE TEMPERATURE: -30°C to 80°C.

OPERATING FORCE: 5.9N max.

SOLDERABILITY: Dip & look solderability testing per C&K spec. #448. Unplated edges of terminals permitted.

PACKAGING: Switches supplied in rigid dispensing tubes in full-tube quantities only, this may affect order quantity. Numbers of switches per tube varies with model.

## Materials

BASE: PPS (UL94V-0).

COVER: PBT (UL94V-0).

ACTUATOR: 4/6 Nylon (UL 94V-0).

MOVABLE CONTACT: Beryllium copper alloy, gold over nickel plate.

FIXED CONTACT: Copper alloy, gold over nickel plate.

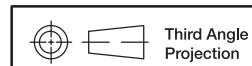
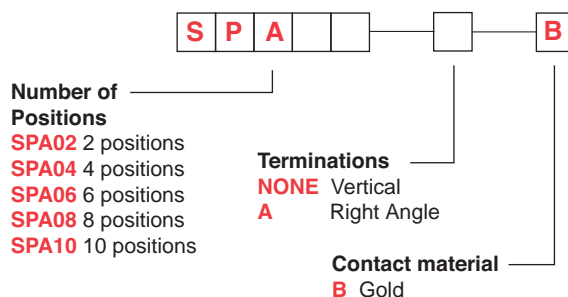
CLIP: Phosphor bronze wire. Phosphor bronze, Tin over nickel plate.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

All switches supplied in "OFF" position.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# SPA Series Single In-line Package Switches

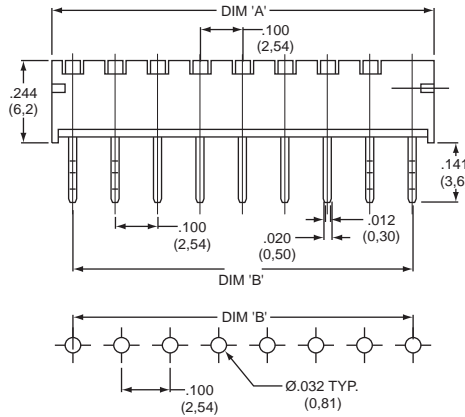
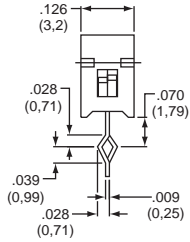
## Vertical



DIP H



SPA08B



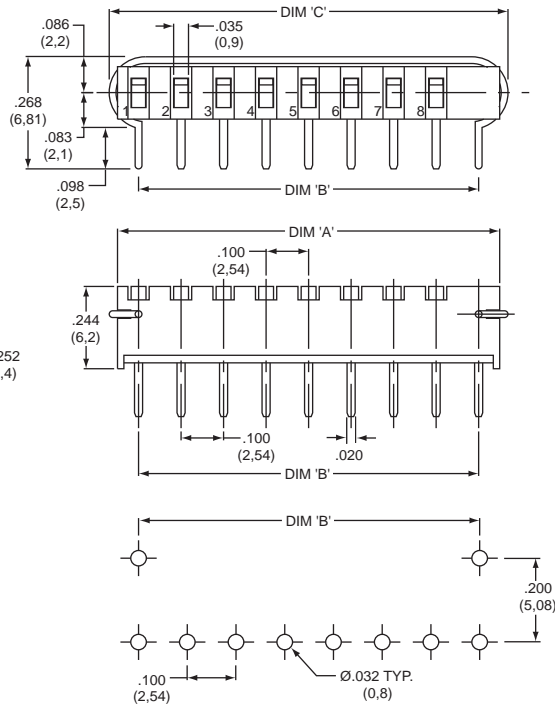
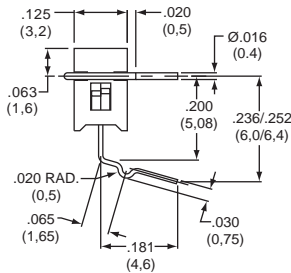
ROHS PART NUMBER	NO. POS.	DIM. 'A'	DIM. 'B'	QUANTITY PER TUBE
<b>SPA02B</b>	2	.342 (8,68)	.200 (5,08)	50
<b>SPA04B</b>	4	.542 (13,76)	.400 (10,16)	30
<b>SPA06B</b>	6	.742 (18,84)	.600 (15,24)	25
<b>SPA08B</b>	8	.942 (23,92)	.800 (20,32)	20
<b>SPA10B</b>	10	1.142 (29,00)	1.000 (25,40)	15

Schematic

SPST



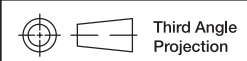
SPA08AB



ROHS PART #	NO. POS.	DIM. 'A'	DIM. 'B'	DIM. 'C'	QTY PER TUBE
<b>SPA02AB</b>	2	.342 (8,68)	.200 (5,08)	.339 (8,6)	50
<b>SPA04AB</b>	4	.542 (13,76)	.400 (10,16)	.540 (13,7)	30
<b>SPA06AB</b>	6	.742 (18,84)	.600 (15,24)	.736 (18,7)	25
<b>SPA08AB</b>	8	.942 (23,92)	.800 (20,32)	.937 (23,8)	20
<b>SPA10AB</b>	10	1.142 (29,00)	1.000 (25,40)	1.138 (28,9)	15

Schematic

SPST



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# RTE Series Low Profile Rotary DIP Switches

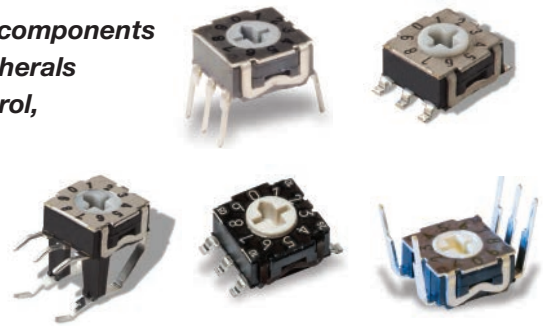


## Features/Benefits

- Thru-hole and surface mount models
- Miniature size with robust metal cover in black or silver nickel finish
- 4, 10, & 16 positions
- Large choice of codings
- Vertical or reverse versions
- RoHS compliant

## Typical Applications

- Timers, automation components
- Computer and peripherals
- Alarms, access control, smoke detectors
- Instrumentation



## Specifications

### CONTACT RATING:

Gold: 100 mA max. 10µ A min. 30 V DC max. 20 mVDC min.

MECHANICAL LIFE: 20,000 actuations

CONTACT RESISTANCE: 100 mΩ max. initial;  
150 mΩ after life

INSULATION RESISTANCE: 10<sup>10</sup> Ω min. initial

DIELECTRIC STRENGTH: 300 Vrms 1 mn

OPERATING TEMPERATURE: -25°C to 85°C.

STORAGE TEMPERATURE: -40°C to 85°C.

PACKAGING: N or R terminations in tube.

V termination in box. G termination in reel, 750 pieces per reel. G termination with flush actuator, 1250 pieces per reel.

## Materials

COVER: Brass, nickel plated (black or silver)

BASE: PPS

ACTUATOR: LCP

MOVABLE CONTACTS: Bronze, gold plated.

STATIONARY CONTACTS: Brass, gold plated.

TERMINALS: See page I-28 to I-29

O-RING: Silicone

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

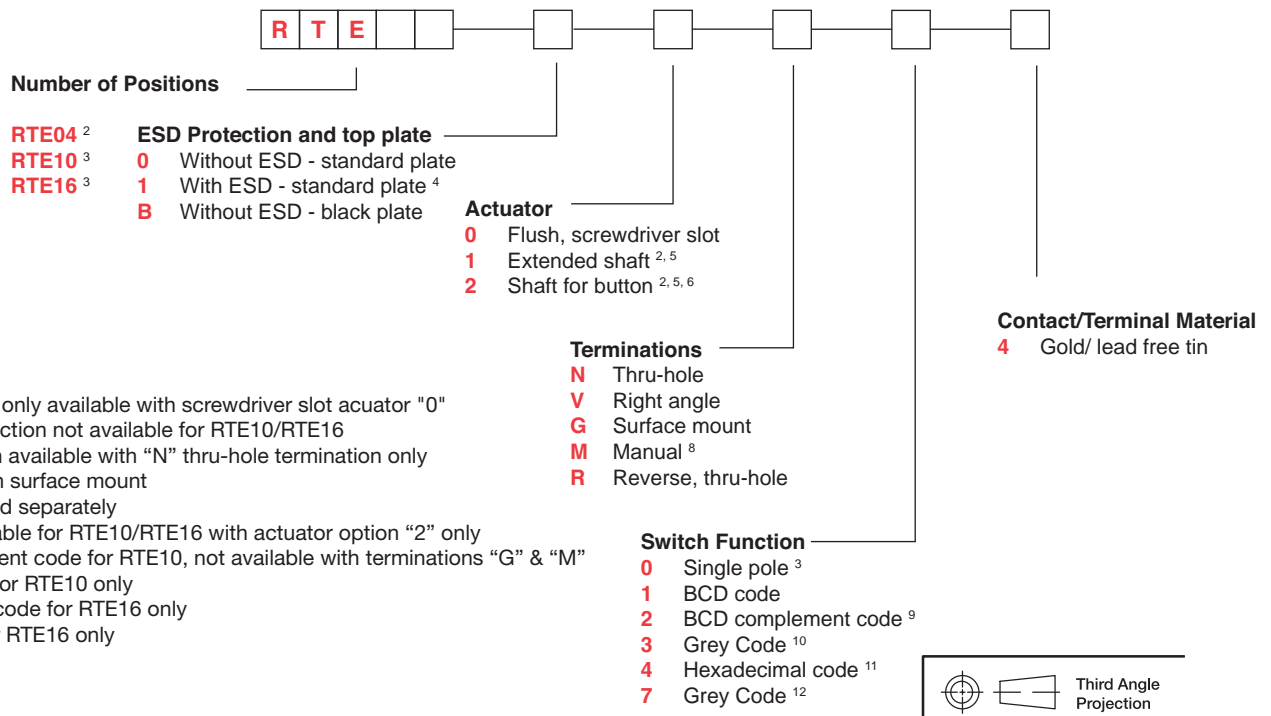
Solderability: Wave soldering 260°/10 s.

SMT are reflow compatible according to C&K lead free specification for SMT components PS-LF-001.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.

**NOTE:** Some of the configurations may not be available or could require some development.



- 2 - RTE04 version only available with screwdriver slot acuator "0"
- 3 - Single pole function not available for RTE10/RTE16
- 4 - ESD protection available with "N" thru-hole termination only
- 5 - Not available in surface mount
- 6 - Buttons ordered separately
- 8 - Manual - available for RTE10/RTE16 with actuator option "2" only
- 9 - BCD complement code for RTE10, not available with terminations "G" & "M"
- 10 - Grey Code - for RTE10 only
- 11 - Hexidecimal code for RTE16 only
- 12 - Grey code for RTE16 only





# RTE Series Low Profile Rotary DIP Switches

## SWITCHES WITH STANDARD OPTIONS

### PC Mount-Terminal Option N



PART NUMBER WITHOUT ESD PIN	WITH ESD PIN	NO. POS.	FUNCTION	QTY PER TUBE
<b>RTE0400N04</b>	<b>RTE0410N04</b>	4	SP4T	65
<b>RTE1000N14</b>	<b>RTE1010N14</b>	10	BCD	65
<b>RTE1600N44</b>	<b>RTE1610N44</b>	16	HEXADECIMAL	65

### Right Angle Mount-Terminal Option V



PART NUMBER	NO. POS.	FUNCTION	QUANTITY
<b>RTE0400V04</b>	4	SP4T	150 per box
<b>RTE1000V14</b>	10	BCD	150 per box
<b>RTE1600V44</b>	16	HEXADECIMAL	150 per box

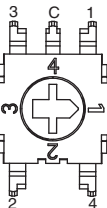
### Surface Mount-Terminal Option G



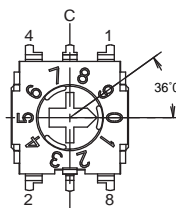
PART NUMBER	NO. POS.	FUNCTION	QUANTITY PER REEL
<b>RTE0400G04</b>	04	SP4T	1250
<b>RTE1000G14</b>	10	BCD	1250
<b>RTE1600G44</b>	16	HEXADECIMAL	1250

## NUMBER OF POSITIONS

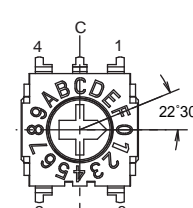
### RTE04 4 POSITION



### RTE10 10 POSITION



### RTE16 16 POSITION



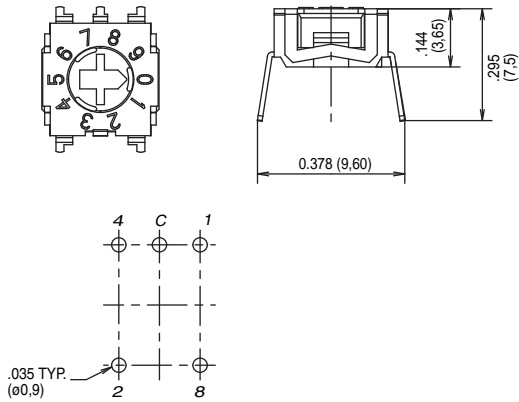
# RTE Series Low Profile Rotary DIP Switches

## ESD PROTECTION

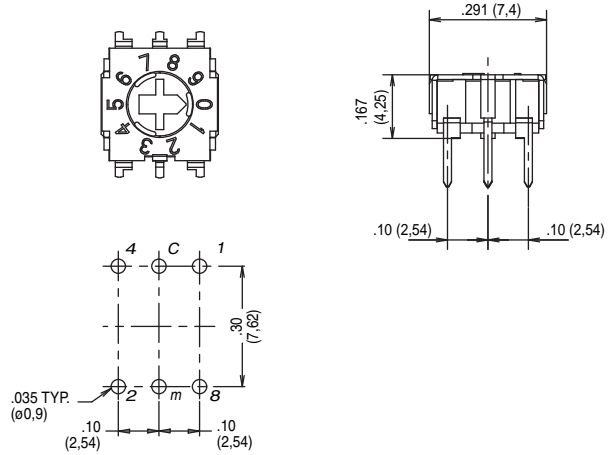


H  
DIP

### 0 WITHOUT



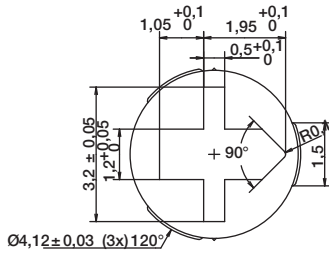
### 1 WITH



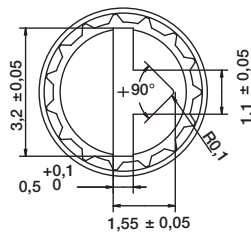
## ACTUATOR



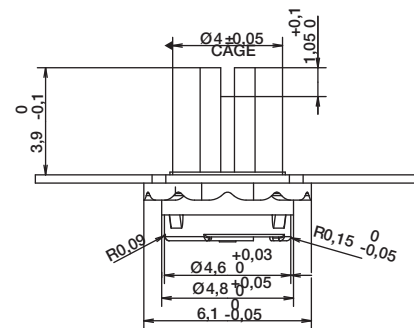
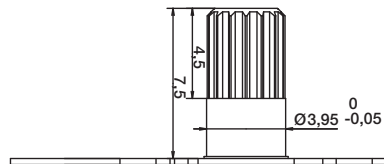
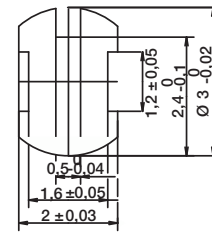
### 0 FLUSH, SCREWDRIVER SLOT



### 1 EXTENDED SHAFT (not available in surface mount)



### 2 SHAFT FOR BUTTON



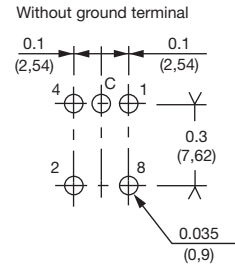
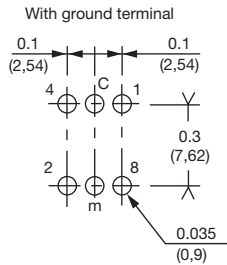
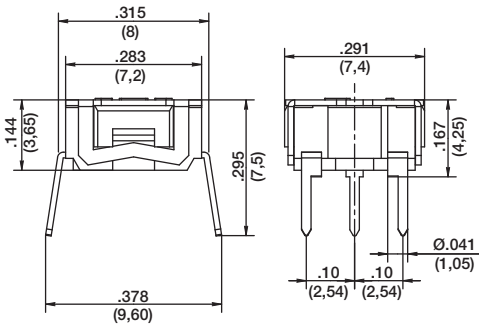
Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

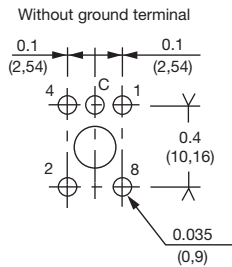
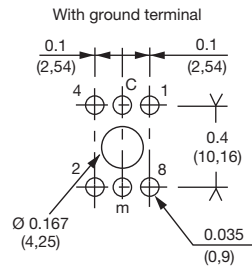
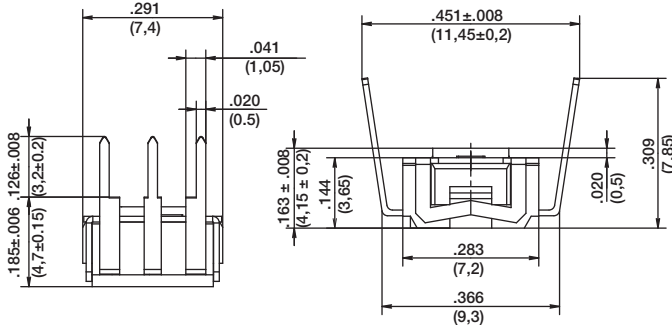
# RTE Series Low Profile Rotary DIP Switches

## TERMINATIONS

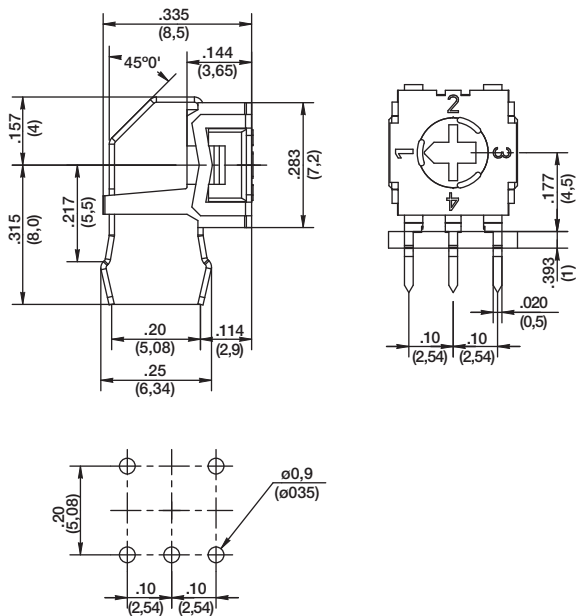
### N THRU-HOLE



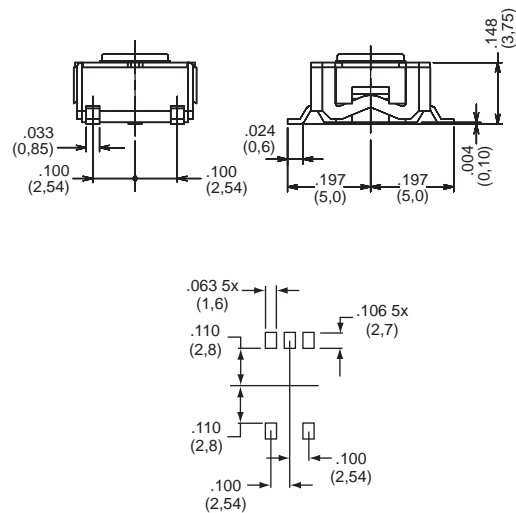
### R REVERSE, THRU-HOLE



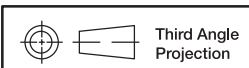
### V RIGHT ANGLE, THRU-HOLE



### G SURFACE MOUNT



PCB layout seen component side

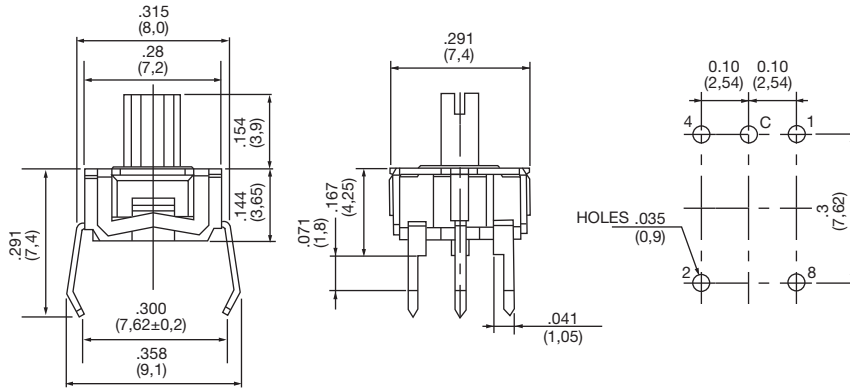


Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

# RTE Series Low Profile Rotary DIP Switches

## TERMINATIONS

**M** OPTION



H

DIP

## SWITCH FUNCTION

### 0 SINGLE POLE

POS.	1	2	3	4
C	●	●	●	●
1	●			
2		●		
3			●	
4				●

### 1 BCD CODE

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1		●				●				
2			●				●			
4				●	●	●				
8								●	●	

### 2 BCD COMPLEMENT CODE

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1	●				●				●	
2	●		●			●				●
4	●	●	●							●
8	●	●	●	●	●	●	●			

Other codes available by request.

### 3 GREY CODE (for RTE10 only)

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1		●	●			●				●
2			●	●	●					
4				●	●	●	●	●	●	●
8									●	●

### 4 HEXADECIMAL CODE

POS.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1		●		●		●		●		●		●		●		●
2			●	●		●		●		●		●		●		●
4				●	●	●	●	●	●	●	●	●	●	●	●	●
8									●	●	●	●	●	●	●	●

### 7 GREY CODE (for RTE04 only)

POS.	1	2	3	4
C	●	●	●	●
1	●			
2		●		
4			●	
8				●

(for RTE16 only)

POS.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1		●		●		●		●		●		●		●		●
2			●	●		●		●		●		●		●		●
4				●	●	●	●	●	●	●	●	●	●	●	●	●
8									●	●	●	●	●	●	●	●

## CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT	RoHS COMPATIBLE	CONTACT MATERIAL	TERMINAL PLATING
<b>4</b>	YES	YES	GOLD	LEAD FREE TIN



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# RTE Series Low Profile Rotary DIP Switches

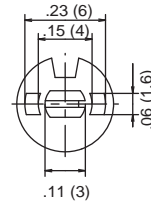
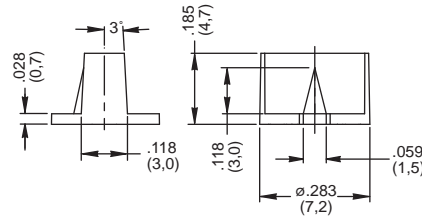
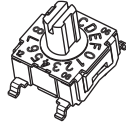


DIP H

## BUTTONS AVAILABLE

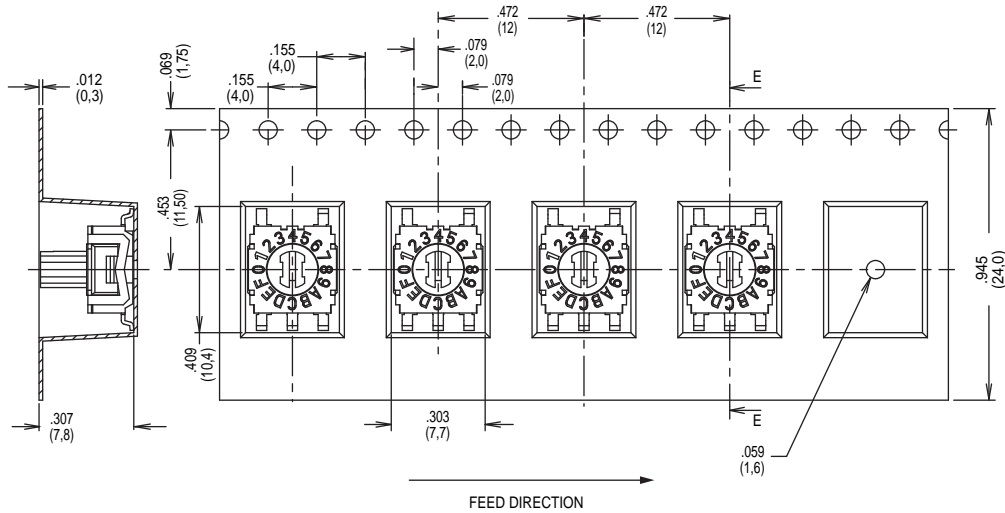
Buttons are ordered separately, shipped in bulk.

Part Number	Color
<b>BTN RTE 40</b>	Red
<b>BTN RTE 50</b>	Green
<b>BTN RTE 90</b>	Black

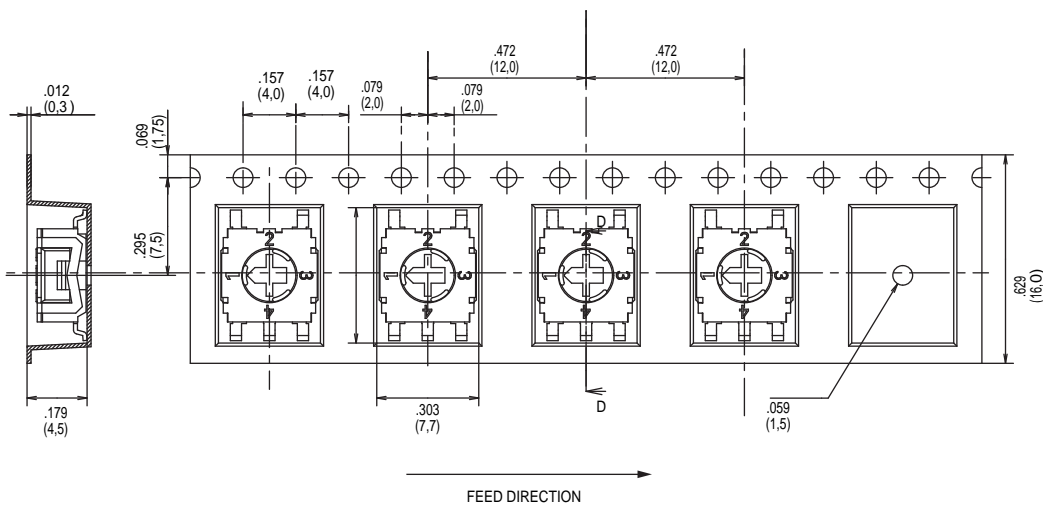


## TAPE AND REEL

Tape and reel for RTExx02Gxx  
750 pieces per reel.



Tape and reel for RTExx00Gxx  
1,250 pieces per reel.



Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# CD Series 8mm DIP Coded Rotary Switches



## Features/Benefits

- **Process sealed – withstands soldering and cleaning**
- **Thru-hole and surface mount models**
- **Compact size saves space – 36% smaller than traditional 10mm DIP**
- **Crisp, positive detent ensures actuation**
- **RoHS compliant**

## Typical Applications

- **Address switching applications**
- **Data storage devices**
- **Computer and peripherals**
- **Instrumentation**



## Specifications

CONTACT RATING: 0.4 VA max. @ 20 V AC or V DC max.  
 MECHANICAL AND ELECTRICAL LIFE:  
 CD10 & CD16: 20,000 actuations.  
 CD08: 12,000 actuations.  
 CONTACT RESISTANCE: 50 milliohms max. initial.  
 INSULATION RESISTANCE: 100 megohms min.  
 @ 250 V AC min.  
 DIELECTRIC STRENGTH: 250 V RMS min. @ sea level.  
 OPERATING TEMPERATURE: -25°C to 85°C.  
 STORAGE TEMPERATURE: -40°C to 85°C.  
 SOLDERABILITY: Per MIL-STD-202F method 208D or EIA RS-186E, method 9 (1 hour steam aging).  
 PACKAGING: Switches supplied in rigid tubes in full-tube quantities only: this may affect order quantity. Tube quantity is 60 pieces per tube. Surface mount switches available in tape & reel packaging per EIA 481A, 800 per reel, surface mount with “M0” actuator only.

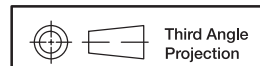
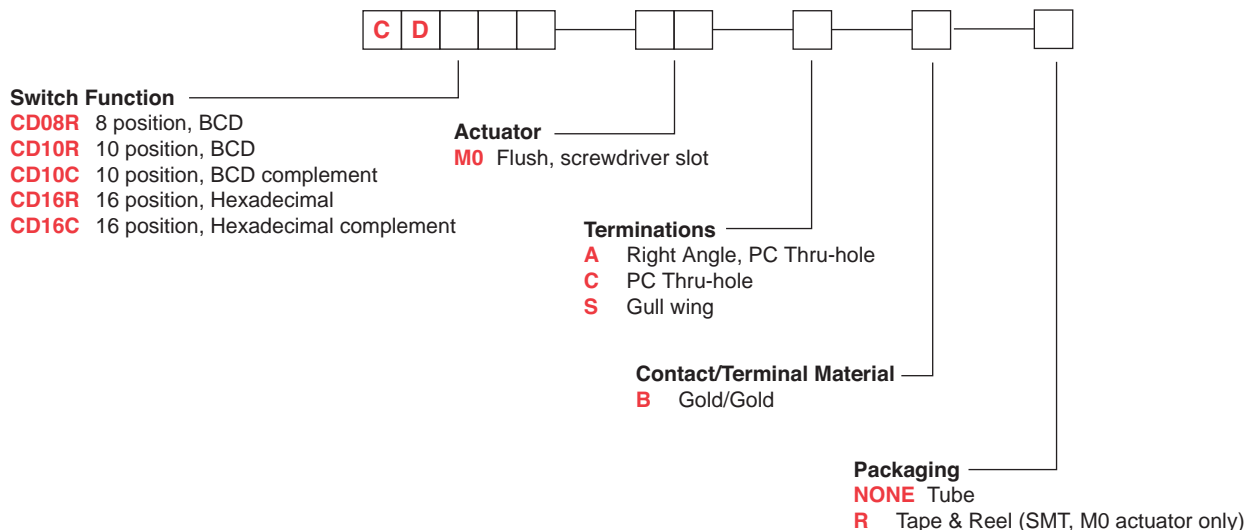
## Materials

COVER: PPS (UL94V-0), Color; Black.  
 BASE: PPS (UL94V-0), Color; Black  
 ACTUATOR: LCP (UL 94V-0), Color White (CDXXR) Color Black (CDXXC)  
 Note: internal o-ring seal standard with all actuators.  
 MOVABLE CONTACTS: Copper alloy with gold plate over nickel plate.  
 STATIONARY CONTACTS: Copper alloy with gold plate over nickel plate.  
 TERMINALS: Copper alloy with gold plate over nickel plate.

**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.



Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change



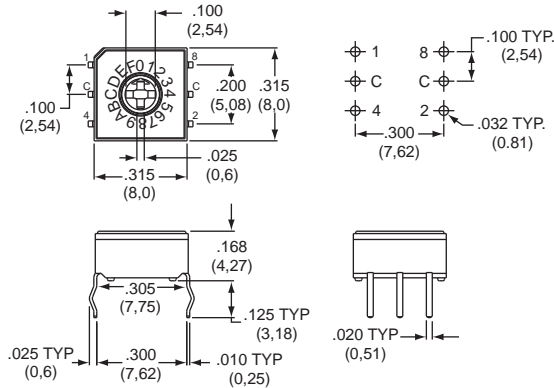
# CD Series 8mm DIP Coded Rotary Switches

## SWITCHES WITH STANDARD OPTIONS

### PC Mount



CD16RM0CB

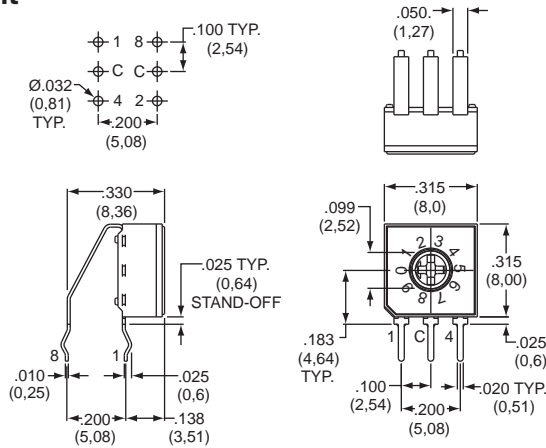


PART NUMBER	NO. POS.	QUANTITY PER TUBE
CD08RM0CB	8	60
CD10RM0CB	10	60
CD10CM0CB	10	60
CD16RM0CB	16	60
CD16CM0CB	16	60

### Right Angle Mount



CD10RM0AB

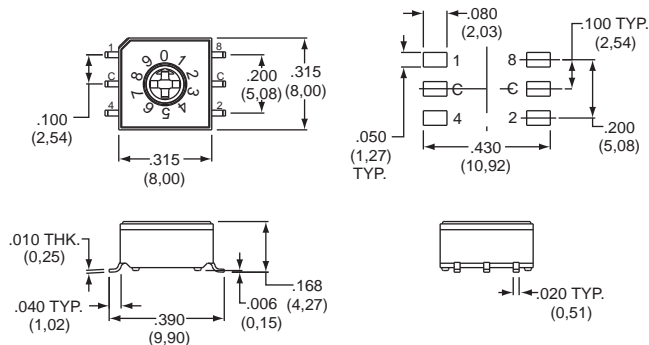


PART NUMBER	NO. POS.	QUANTITY PER TUBE
CD08RM0AB	8	60
CD10RM0AB	10	60
CD10CM0AB	10	60
CD16RM0AB	16	60
CD16CM0AB	16	60

### Surface Mount



CD10RM0SB



PART NUMBER	NO. POS.	QUANTITY PER TUBE
CD08RM0SB	8	60
CD10RM0SB	10	60
CD10CM0SB	10	60
CD16RM0SB	16	60
CD16CM0SB	16	60

Note: For tape and reel packaging, add 'R' to end of part number.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# CD Series 8mm DIP Coded Rotary Switches

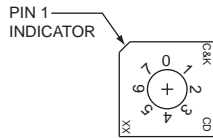


H  
DIP

## SWITCH FUNCTION

**CD08R** 8 POSITION, BCD  
ACTUATOR COLOR: WHITE

POS.	0	1	2	3	4	5	6	7
C	●	●	●	●	●	●	●	●
1		●		●		●		●
2			●		●		●	
4				●	●	●	●	
8								



Switches ship and to be solder processed in position "0"

**CD10R** 10 POSITION, BCD  
ACTUATOR COLOR: WHITE

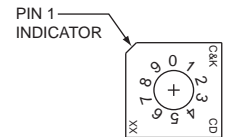
POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1		●		●		●		●		●
2			●		●		●		●	
4				●	●	●	●			
8									●	●

Switches ship and to be solder processed in position "0"

**CD10C** 10 POSITION, BCD COMPLEMENT  
ACTUATOR COLOR: BLACK

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1	●		●		●		●		●	
2	●			●		●		●		●
4	●	●	●	●					●	●
8	●	●	●	●	●	●	●	●	●	●

Switches ship and to be solder processed in position "7"



**CD16R** 16 POSITION, HEXADECIMAL  
ACTUATOR COLOR: WHITE

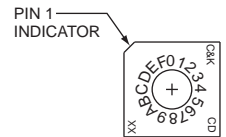
POS.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1		●		●		●		●		●		●		●		●	
2			●		●		●		●		●		●		●		
4				●	●	●	●					●	●	●	●		
8										●	●	●	●	●	●	●	

Switches ship and to be solder processed in position "0"

**CD16C** 16 POSITION, HEXADECIMAL COMPLEMENT  
ACTUATOR COLOR: BLACK

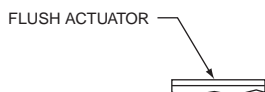
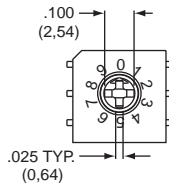
POS.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1	●		●		●		●		●		●		●		●		
2	●			●		●		●		●		●		●		●	
4	●	●	●	●							●	●	●	●			
8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

Switches ship and to be solder processed in position "F"

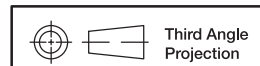


## ACTUATOR

**M0** (STD.) FLUSH WITH SCREWDRIVER SLOT



NOTE: Designed for #0 Phillips screwdriver.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change





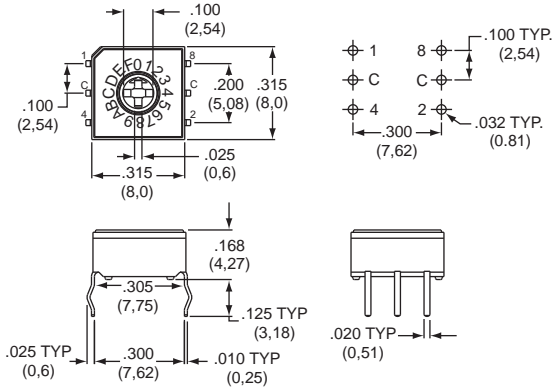
# CD Series 8mm DIP Coded Rotary Switches

## TERMINATIONS

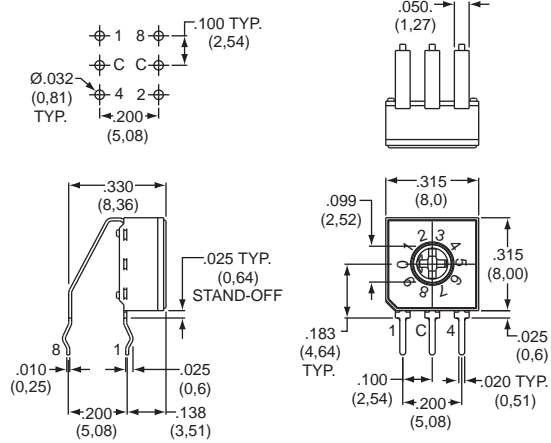
DIP

H

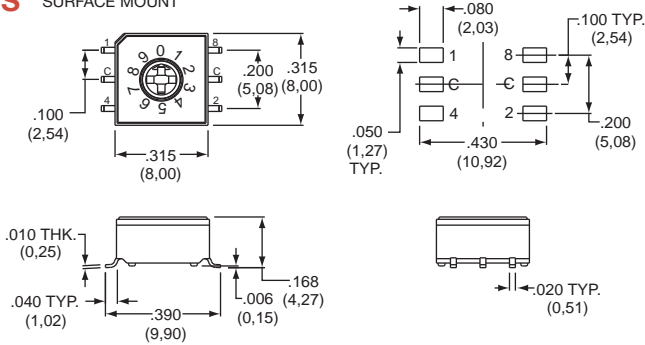
### C PC, THRU-HOLE



### A RIGHT ANGLE, PC THRU-HOLE



### S SURFACE MOUNT



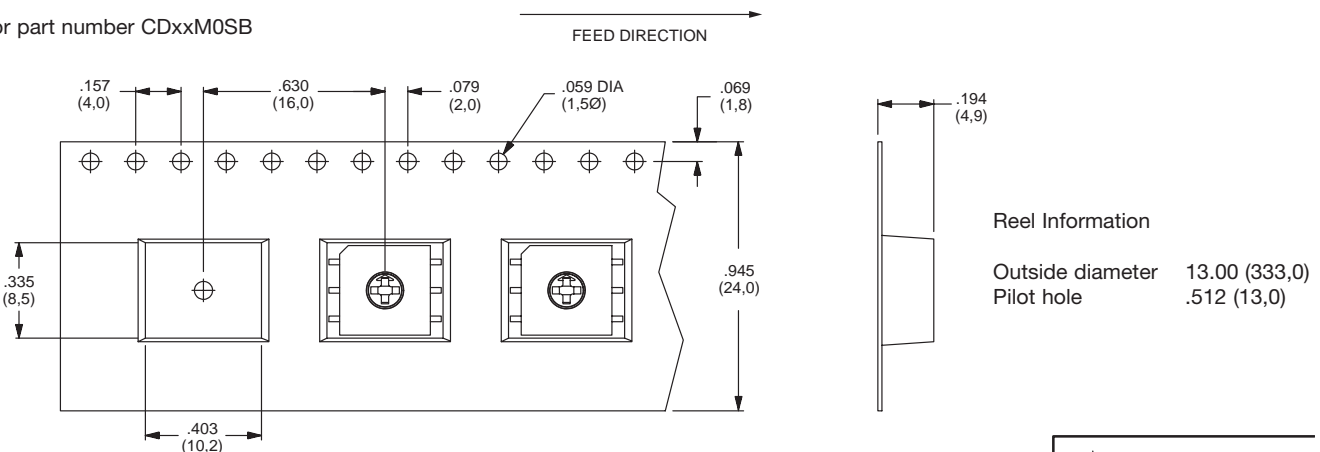
## CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL	TERMINAL PLATING	RATING	
<b>B</b>	YES	YES	GOLD	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VC MAX. @ 20 V AC or DC MAX.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

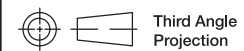
## TAPE & REEL

For part number CDxxM0SB



### Reel Information

Outside diameter 13.00 (333,0)  
Pilot hole .512 (13,0)



Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# CRD Series 10mm DIP Coded Rotary Switches

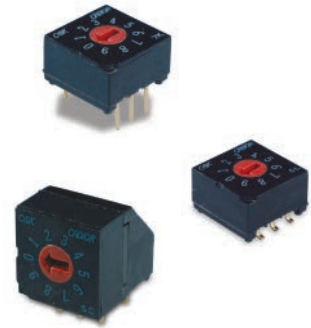


## Features/Benefits

- **Process sealed – withstands soldering and cleaning**
- **Thru-hole and surface mount models**
- **Crisp, positive detent ensures actuation**
- **Computer and peripherals**
- **RoHS compliant**

## Typical Applications

- **Address switching applications**
- **Data storage devices**
- **Computer and peripherals**
- **Instrumentation**



## Specifications

CONTACT RATING: 0.4 V AC, DC 20 V max.  
 ELECTRICAL LIFE: 20,000 steps min. @ 5 V DC 10 mA.  
 MECHANICAL LIFE: 30,000 steps min.  
 CONTACT RESISTANCE: 100 milliohms max. initial @ 2 V DC 10 mA.  
 INSULATION RESISTANCE: 1000 megohms min. @ 100 V DC  
 DIELECTRIC STRENGTH: 300 V AC for 1 minute.  
 OPERATING TEMPERATURE: -20°C to 85°C.  
 STORAGE TEMPERATURE: -40°C to 85°C.  
 OPERATING FORCE: 1000 grams max.  
 PACKAGING: Switches supplied in anti-static tubes in full quantities only. This may affect order quantity. Surface mount models with MO actuators available in tape and reel, 500 pieces per reel.

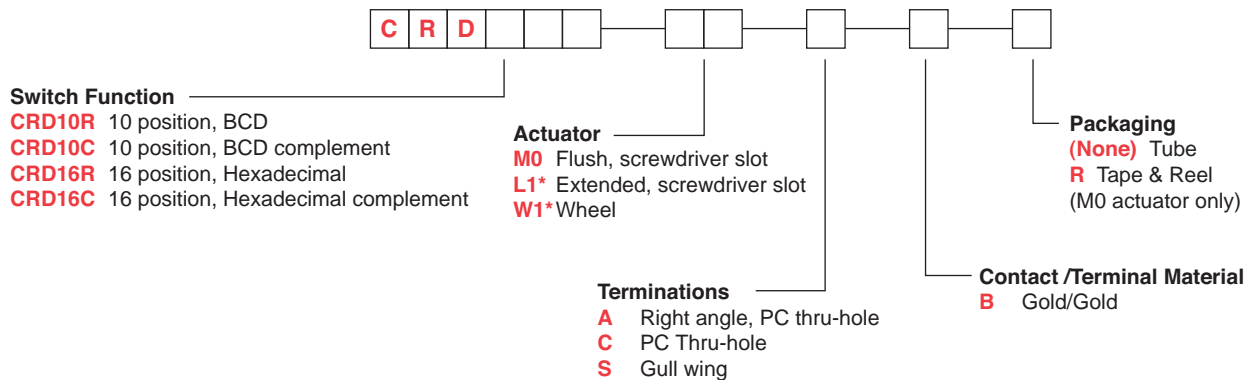
## Materials

COVER: PPS (black)  
 HOUSING: PPS (black)  
 ACTUATOR: PA 6T M0 actuator option; PBT L1 and W1 actuator option.  
 CONTACTS: Beryllium Copper with Gold over Nickel plate  
 TERMINALS: Brass with Gold Nickel plate.

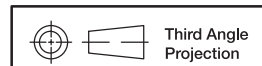
**Note:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## How To Order

The Build-A Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box.



\* Note - L1 and W1 actuators are not available in termination "S"



Third Angle Projection  
 Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change



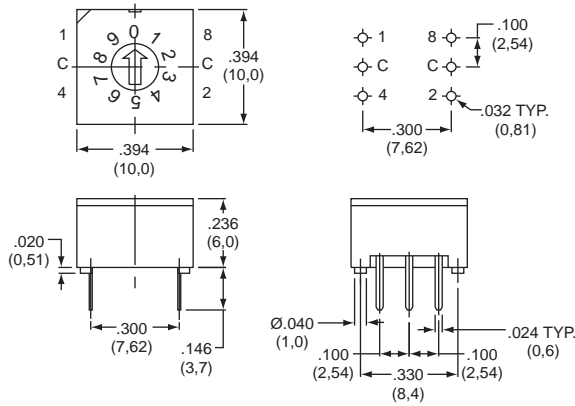
# CRD Series 10mm DIP Coded Rotary Switches

## SWITCHES WITH STANDARD OPTIONS



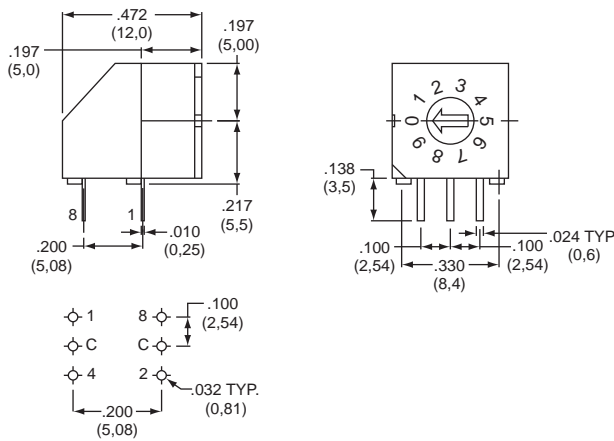
DIP

### PC Mount



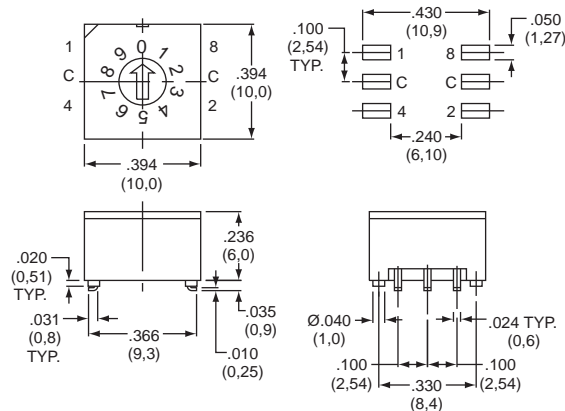
PART NUMBER	NO. POS.	QUANTITY PER TUBE
<b>CRD10RM0CB</b>	10	45
<b>CRD16RM0CB</b>	16	45

### Right Angle Mount



PART NUMBER	NO. POS.	QUANTITY PER TUBE
<b>CRD10RM0AB</b>	10	45
<b>CRD16RM0AB</b>	16	45

### Surface Mount



PART NUMBER	NO. POS.	QUANTITY PER TUBE
<b>CRD10RM0SB</b>	10	45
<b>CRD16RM0SB</b>	16	45



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# CRD Series 10mm DIP Coded Rotary Switches



H  
DIP

## SWITCH FUNCTION

### CRD10R

10 POSITION, BCD  
ACTUATOR COLOR: RED

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1		●		●		●		●		●
2			●		●		●		●	
4				●		●		●		●
8					●		●		●	●

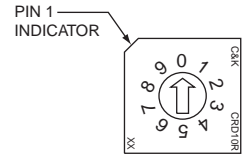
Switches ship and to be solder processed in position "0"

### CRD10C

10 POSITION, BCD COMPLEMENT  
ACTUATOR COLOR: ORANGE

POS.	0	1	2	3	4	5	6	7	8	9
C	●	●	●	●	●	●	●	●	●	●
1	●									
2	●	●								
4	●	●	●							
8	●	●	●	●						

Switches ship and to be solder processed in position "7"



### CRD16R

16 POSITION, HEXADECIMAL  
ACTUATOR COLOR: BLACK

POS.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1		●														
2			●													
4				●		●										
8					●		●		●		●		●		●	●

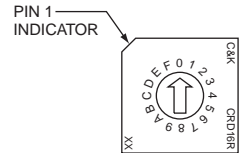
Switches ship and to be solder processed in position "0"

### CRD16C

16 POSITION, HEXADECIMAL COMPLEMENT  
ACTUATOR COLOR: WHITE

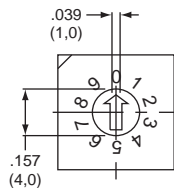
POS.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1	●															
2	●	●														
4	●	●	●													
8	●	●	●	●												

Switches ship and to be solder processed in position "F"



## ACTUATOR

(STD.) FLUSH WITH SCREWDRIVER SLOT

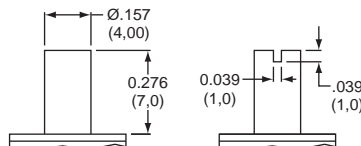
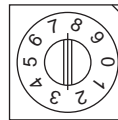


FLUSH ACTUATOR



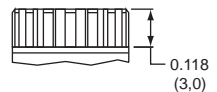
### L1\*

EXTENDED WITH SCREWDRIVER SLOT



### W1\*

WHEEL



**NOTE:** Designed for #0 Phillips screwdriver.

\* L1 and W1 actuators are not available in termination "S"



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

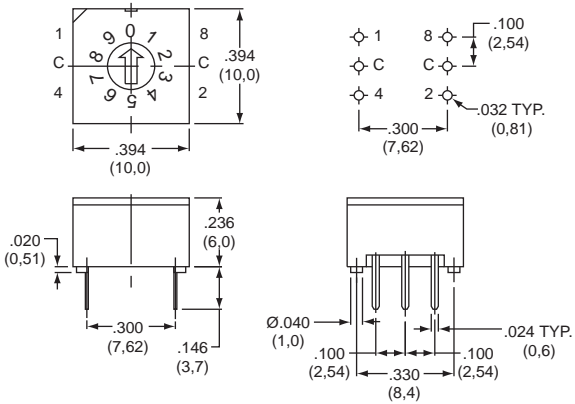


# CRD Series 10mm DIP Coded Rotary Switches

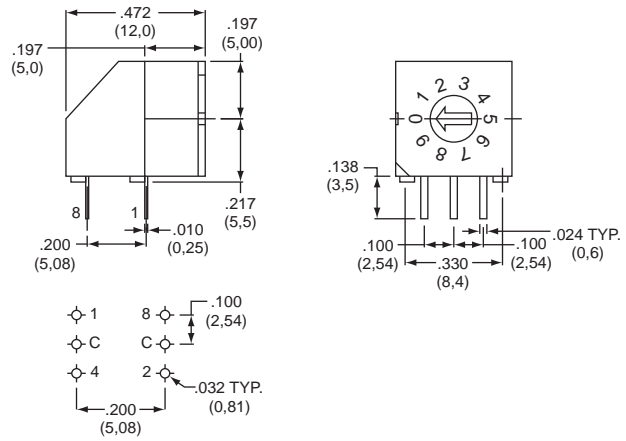
## TERMINATIONS



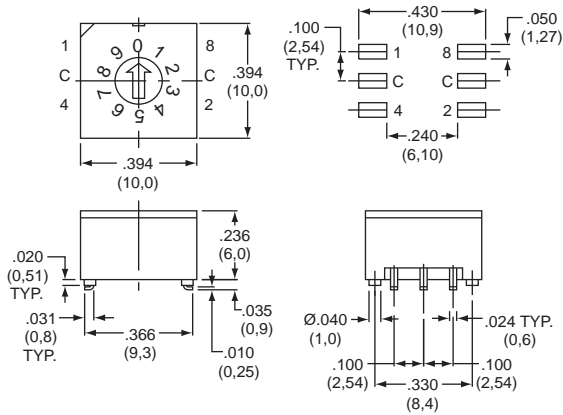
### C PC, THRU-HOLE



### A RIGHT ANGLE, PC THRU-HOLE



### S SURFACE MOUNT



### M0

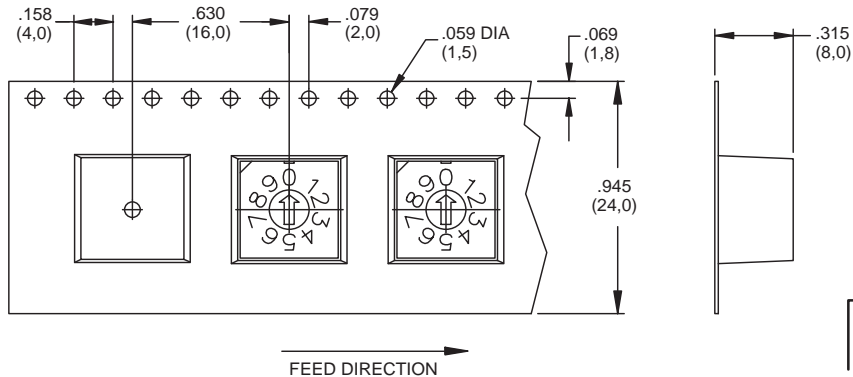
## CONTACT MATERIAL



OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL	TERMINAL PLATING	RATING	
<b>B</b>	YES	YES	GOLD	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VC MAX. @ 20 V AC or DC MAX.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.




## TAPE & REEL



Third Angle Projection  
Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# Snap-acting Product Selection Guide

Snap-acting





<b>Snap-acting</b>							
<b>Series</b>	<b>TF</b>	<b>TFS</b>	<b>TF2</b>	<b>TM</b>	<b>LC</b>	<b>LCA</b>	<b>LCS</b>
<b>Switch Type</b>	Miniature	Sealed Miniature	Sealed Miniature	Miniature	Subminiature Precision	Subminiature	Sealed Subminiature
<b>Poles/Throws</b>	SPST, SPDT	SPDT	SPDT	SPST, SPDT	SPST, SPDT	SPDT	SPST
<b>Maximum Current</b>	21 Amps	10 Amps	10 Amps	15 Amps	10.1 Amps	10 Amps	6 Amps
<b>Terminations</b>							
Solder	•		•	•	•	•	•
Turret							
Quick Connect	•	•	•	•	•	•	•
Screw			•	•			
Wire Leads		•			•		•
PC					•	•	•
Formed PC					•	•	
Extended Operations	•	•		•	•	•	
Sealed		•					•
<b>Page No.</b>	J-6	J-12 / J-16	J-20	J-26	J-32	J-36	J-40

<b>Snap-acting</b>								
<b>Series</b>	<b>MM</b>	<b>ZM</b>	<b>ZMA</b>	<b>ZMB</b>	<b>ZMS</b>	<b>ZMSM</b>	<b>MDS</b>	<b>HB</b>
<b>Switch Type</b>	Subminiature Precision	Subminiature	Subminiature	Subminiature	Sealed Subminiature	Sealed Subminiature	Subminiature	Standard Precision
<b>Poles/Throws</b>	SPDT	SPDT	SPDT	SPDT	SPDT	SPDT	SPDT	SPST, SPDT
<b>Maximum Current</b>	7 Amps	3 Amps	3 Amps	0.1 Amps	3 Amps	3 Amps	300 m Amps	20 Amps
<b>Terminations</b>								
Solder			•	•	•	•	•	•
Quick Connect								•
Wire Leads					•	•		
Screw								•
PCB Thru-hole	•	•	•	•	•	•	•	
Flat & Step Base								•
<b>Bushing</b>								15/32-32
Sealed					•	•		
<b>Page No.</b>	J-44	J-47	J-50	J-54	J-57	J-61	J-65	J-71



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# Snap-acting Product Selection Guide

<b>Snap-acting</b>				
<b>Series</b>	<b>A</b>	<b>TL</b>	<b>DS</b>	<b>LCB</b>
<b>Switch Type</b>	General Purpose	Door Interlock	Door Interlock	Subminiature
<b>Poles/Throws</b>	SPST, SPDT, DP	SPDT	SPDT, DPDT	SPST, SPDT
<b>Maximum Current</b>	30.1 Amps	15 Amps	0.1, 10, 16A	5A
<b>Terminations</b>				
Solder				•
Quick Connect	•	•	•	•
Wire Leads				
Screw		•		
PCB Thru-hole				•
Flat & Step Base				
<b>Bushing</b>	3/8-23			
<b>Page No.</b>	J-77	J-82	J-85	J-88



Snap-acting






# Snap-acting Technical Data

## HOW TO CHOOSE PRECISION SNAP-ACTING SWITCHES AND ACTUATORS

This catalog describes electric switches that satisfy the following definition: "A precision snap-acting switch is a mechanically operated electric switch having predetermined and accurately controlled characteristics and having contacts other than blade-and-jaw, or mercury-type, where the maximum separation between any butting contacts is 1/8 inch."

In choosing a switch, the first thing to consider is its electrical rating. As a basic part of an electric control system, the switch must be able to carry the full load current in the system, to interrupt this current, and to handle any surge of current that may occur when the switch contacts close or any transients that occur when contacts open.

The method of applying mechanical force to operate the switch influences the choice of actuator. Basic switches are provided with leaf spring, levers, or other linkages between the switch plunger and the actuating device, which are typically used to provide additional overtravel and reduce the operating force. The differential travel measured at the free end of the leaf or lever is considerably greater than that measured at the switch plunger and max. operating force is adequately smaller. Table 1 relates types of actuators to means of applying operating force.

MOTION OF APPLIED OPERATING FORCES	ACTUATOR								
	Pin	Overtravel Plunger	Roller Plunger	Leaf	Roller Leaf	Hinged Lever	Hinged Roller Lever	Reverse-Acting Hinged Lever	Reverse-Acting Hinged Roller Lever
	Basic	D, Q, J	R	L	W	T	A	Y	F
 CAM Rotary			√	√	√	√	√	√ <sup>1</sup>	√ <sup>1</sup>
 LEVER Angular	√	√ <sup>2</sup>	√ <sup>2</sup>	√	√	√	√	√	√
 SLIDE Wedge			√		√		√		√
 PLUNGER In-Line	√ <sup>3</sup>	√		√		√		√	
 BI-METAL or BELLOWS Slow In-Line	√	√							

√ Suitable for this actuating method.

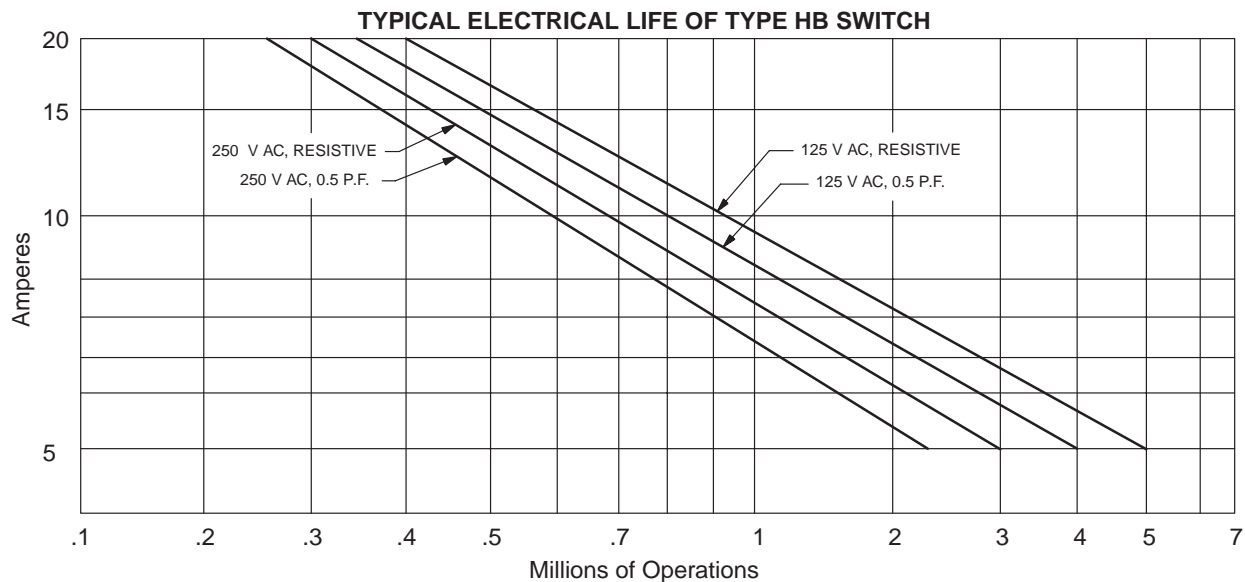
<sup>1</sup> Where large overtravel is required.

<sup>2</sup> Do not use when there is side thrust.

<sup>3</sup> Use only where the actuating device contains provisions for absorbing excess over travel.

## ELECTRICAL LIFE CHARACTERISTICS FOR SNAP-ACTING SWITCHES

The primary limitation to electrical life of a switch is wear of the contacts. In general, contacts wear out more quickly as current or voltage is increased and as power-factor is decreased. This is indicated by the graph below, which shows electrical life of switches tested under ordinary atmospheric conditions, operated 60 times a minute, with AC power handled on both the normally open and the normally closed contacts. The high inrush current encountered in lamp loads and in motor or other inductive loads is responsible for decreased contact life under such loading.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# Snap-acting Technical Data

## MECHANICAL LIFE CHARACTERISTICS FOR SNAP-ACTING SWITCHES

Fatigue of the internal spring blade is the limiting factor in the mechanical life of a switch. This fatigue can often be reduced and the life thereby extended, by reducing overtravel. One method is to use a leaf or lever actuator or a plunger containing an overtravel-absorbing spring. Tests on switches of the types covered in this catalog indicate that the mechanical life of a lever actuated switch is more than double that of a switch having the operating force applied directly on the pin.

Mechanical life is also affected by the combination of total travel and operating force. Thus a high-sensitivity switch which has small travel and light force, has about twice the life expectancy of a high current type switch, in which the travel/ force combination is relatively high. Experience indicates that million of operations is a reasonable mechanical life expectancy for a basic snap switch.

For the best mechanical life, the applied overtravel force should not exceed three times the operating force.

## AC RATINGS FOR SNAP-ACTING SWITCHES

Switches used to control alternating current loads, up to the ratings shown in this catalog, will maintain repeatability of characteristics and provide long electrical life (refer to graph on page K-3). In special circumstances, higher currents or voltages may be controlled, but changes in performance must be anticipated.

Switches used to control "dry circuits" can be furnished, but factory recommendations should be secured.

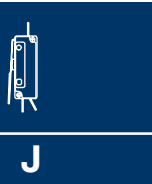
## DC RATINGS FOR SNAP-ACTING SWITCHES

To use the table below, determine the contact separation of the switch and select the ratings from the appropriate line. The maximum current rating must be limited to the current value listed for that switch type in the body of the catalog.

CONTACT SEPARATION	DIRECT CURRENT VOLTAGE	ACTUATOR				INDUCTIVE			
		Heater Load		Lamp Load (tungsten)		Motor, Relay, or Solenoid Load			
		Normally Open Contact	Normally Closed Contact	Normally Open Contact	Normally Closed Contact	Sea Level		50,000 Feet	
						Normally Open Contact	Normally Closed Contact	Normally Open Contact	Normally Closed Contact
Inches	Volts	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes
.010	6-8	15.0	20.0	1.5	3.0	8.0	8.0	7.0	7.0
	12-14	15.0	20.0	1.5	3.0	5.0	5.0	5.0	5.0
	24-30	2.0	2.0	1.5	2.0	1.0	1.0	1.0	1.0
	110-115	0.4	0.4	0.4	0.4	0.03	0.03	0.02	0.02
	220-230	0.2	0.2	0.2	0.2	0.02	0.02	0.01	0.01
.020	6-8	15.0	20.0	1.5	3.0	15.0	20.0	15.0	15.0
	12-14	15.0	20.0	1.5	3.0	10.0	10.0	8.0	8.0
	24-30	6.0	6.0	1.5	2.0	5.0	5.0	2.0	2.0
	110-115	0.4	0.4	0.4	0.4	0.05	0.05	0.03	0.03
	220-230	0.2	0.2	0.2	0.2	0.03	0.03	0.02	0.02
.040	6-8	15.0	20.0	1.5	3.0	15.0	20.0	15.0	15.0
	12-14	15.0	20.0	1.5	3.0	15.0	20.0	15.0	15.0
	24-30	10.0	10.0	1.5	2.0	10.0	10.0	5.0	5.0
	110-115	0.6	0.6	0.6	0.6	0.1	0.1	0.05	0.05
	220-230	0.3	0.3	0.3	0.3	0.05	0.05	0.03	0.03
.070	6-8	15.0	20.0	1.5	3.0	15.0	20.0	15.0	15.0
	12-14	15.0	20.0	1.5	3.0	15.0	20.0	15.0	15.0
	24-30	15.0	20.0	1.5	2.0	10.0	10.0	7.5	7.5
	110-115	0.75	0.75	0.75	0.75	0.4	0.4	0.2	0.2
	220-230	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



Snap-acting

# TF Series Miniature Snap-acting Switches



## Features/Benefits

- Broad range of operating forces
- Ratings up to 21 AMPS
- Wide variety of actuator styles
- Quick connect terminations

## Typical Applications

- Motor controls
- Thermostatics
- Portable tools



## Specifications

CONTACT RATING: From low level\* to 21 AMPS @ 277 V AC.

ELECTRICAL LIFE: 300,000 cycles at 10 AMPS @ 250 V AC, consult Customer Service Center for typical life of higher rated switches.

INSULATION RESISTANCE: 1,000 M ohm min.

DIELECTRIC STRENGTH: 1,500 Vrms min. @ sea level.

OPERATING TEMPERATURE: -40°F to 185°F (-40°C to 85°C).

OPERATING FORCE: From 15 to 400 grams at actuator button available.

MOUNTING: Torque screws 2-5 in/lbs.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max. Standard electrical life per UL 1054, rated for 6,000 operations.

## Materials

SWITCH HOUSING: Thermoplastic (UL 94V-0).

ACTUATOR BUTTON: Thermoplastic (UL 94V-0).

SPRING: Copper alloy.

PIVOT: Brass alloy.

MOVABLE CONTACTS: Gold alloy for ratings 1 AMP or less.

Fine silver for ratings greater than 1 AMP up to 15 AMPS.

Precious metal alloy for ratings greater than 15 AMPS.

STATIONARY CONTACTS: Gold alloy for ratings 1 AMP or less.

Fine silver for ratings greater than 1 AMP.

TERMINALS: Brass alloy for ratings up to 10 AMPS.

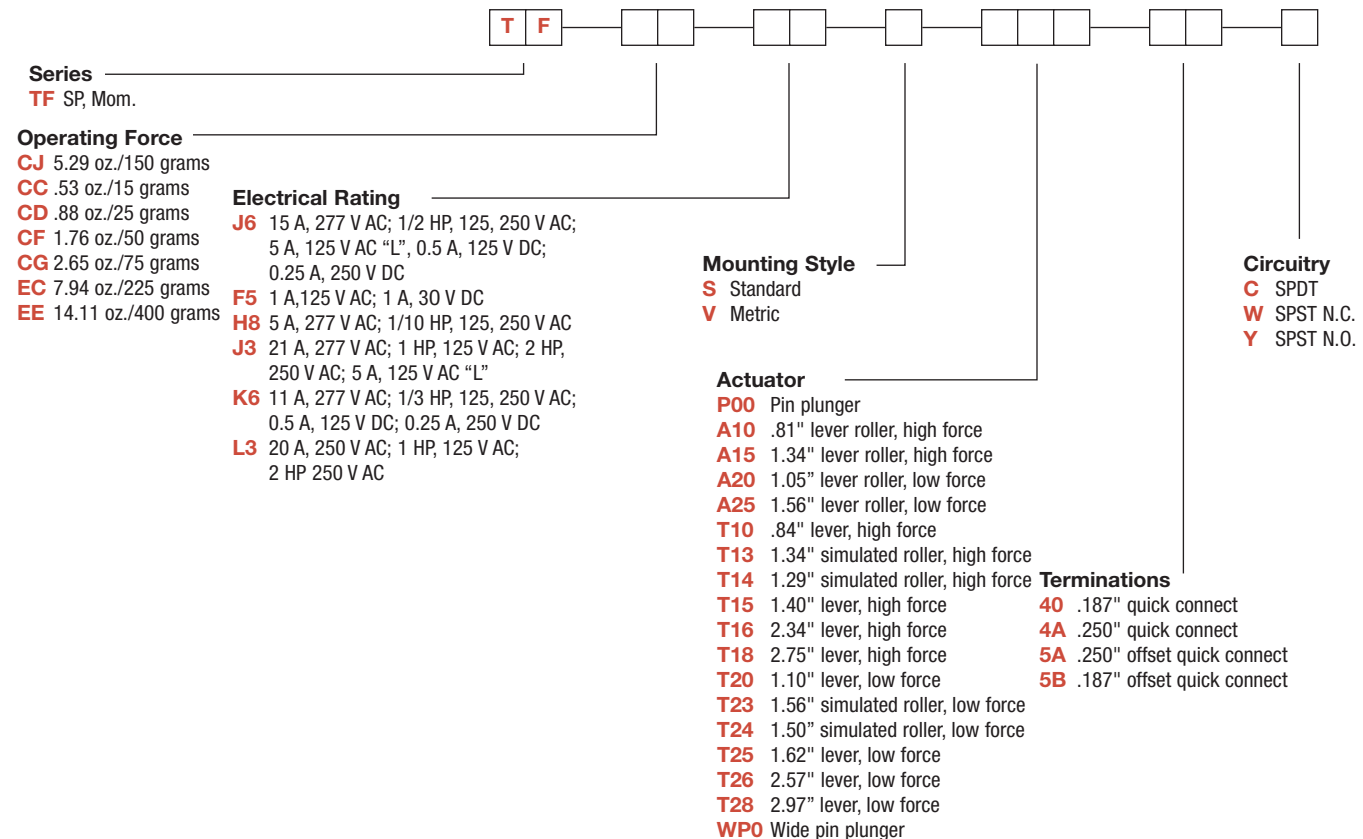
Copper alloy for ratings greater than 10 AMPS.

**NOTE:** Specifications and materials listed above are switches with standard options. For information on specific and custom switches, consult Customer Service Center.



## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-6 through J-11. For additional options not shown in catalog, consult Customer Service Center.

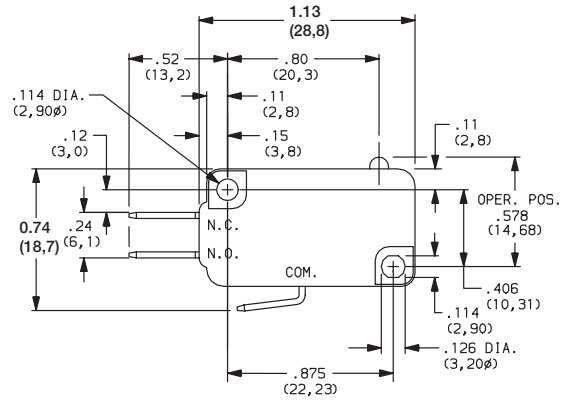
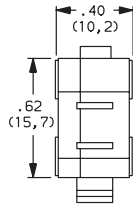


Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# TF Series Miniature Snap-acting Switches

## SERIES

**TF** MINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY

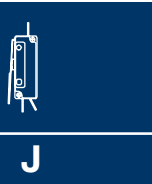


## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
<b>CC</b>	.53 15
<b>CD</b>	.88 25
<b>CF</b>	1.76 50
<b>CG</b>	2.65 75
<b>CJ</b>	5.29 150
<b>EC</b>	7.94 225
<b>EE*</b>	14.11 400

\*Minimums may apply, consult Customer Service Center.

Operating Force option 'CC' not available with 'T18 & T26' Actuator options.  
Operating force varies with actuator option, see ACTUATOR option section.



Snap-acting

## ELECTRICAL RATING

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL		ELECTRICAL RATING  US
			MOVABLE CONTACT	STATIONARY CONTACT	
<b>F5</b>	Yes	Yes	Gold alloy	Gold alloy	From low level* to 1 AMP @ 125 V AC, 1 AMP @ 30 V DC.
<b>H8</b>	Yes	Yes	Fine Silver	Fine Silver	5 AMPS @ 277 V AC; 1/10 HP @ 125 & 250 V AC.
<b>J3</b>	Yes	Yes			21 AMPS @ 277 V AC; 1 HP @ 125 V AC; 2 HP @ 250 V AC; 5 AMPS @ 125 V AC "L".
<b>J6</b>	Yes	Yes			15 AMPS @ 277 V AC; 1/2 HP @ 125 & 250 V AC; 5 AMPS @ 125 V AC "L". 0.5 AMP @ 125 V DC; 0.25 AMP @ 250 V DC.
<b>K6</b>	Yes	Yes			11 AMPS @ 277 V AC; 1/3 HP @ 125 & 250 V AC; 0.5 AMP @ 125 V DC; 0.25 AMP @ 250 V DC.
<b>L3</b>	Yes	Yes	Silver alloy		20 AMPS @ 250 V AC; 1 HP @ 125 V AC; 2 HP @ 250 V AC

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

All models US

Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change




# TF Series Miniature Snap-acting Switches

## ELECTRICAL RATING

ELECTRICAL RATING	AMPS (REF.)	OPERATING FORCE						
		CC (15)	CD (25)	CF (50)	CG (75)	CJ (150)	EC (225)	EE (400)
F5	1	•	•	•	•	•	•	
H8	5	•	•	•	•	•	•	•
J3	21	X	X	X	X	•	•	•
J6	15	X	X	X	X	•	•	•
K6	11	X	•	•	•	•	•	•
L3	20	X	X	X	X	•	•	•

- AVAILABLE
- X NOT AVAILABLE
- \*\* Available with 4A & 5A terminations only, see page J-10.

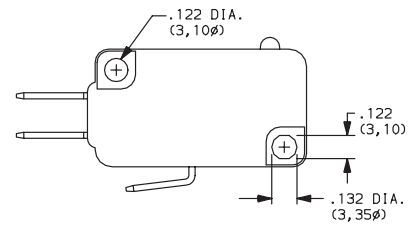
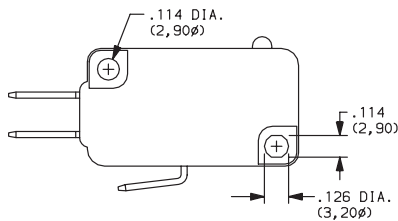
All models  us  
Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

## MOUNTING STYLE

**S** STANDARD  
For 4-40 screw size

**V** Metric  
For 3 mm screw size

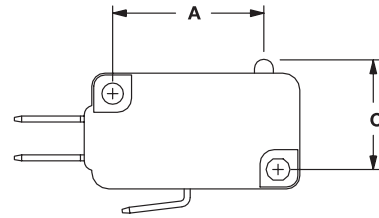


Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

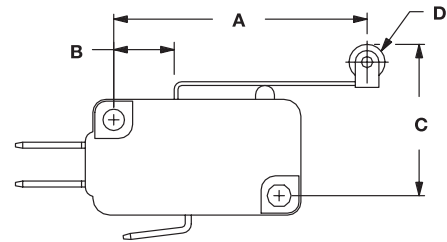
# TF Series Miniature Snap-acting Switches

## ACTUATOR

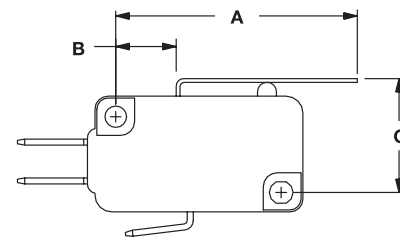
OPTION CODE	FIG.	DIM. A	DIM. B	DIM. C	DIM. D
<b>P00</b>	1	.80 (20,3)	—	.578 ± .015 (14,68 ± 0,38)	—
<b>A10</b>	2	.81 (20,6)	.32 (8,1)	.810 ± .020 (20,57 ± 0,51)	.19 dia. (4,80)
<b>A15</b>	2	1.34 (34,0)	.32 (8,1)	.810 ± .030 (20,57 ± 0,76)	.19 dia. (4,80)
<b>A20</b>	2	1.05 (26,7)	.54 (13,7)	.810 ± .050 (20,57 ± 1,27)	.19 dia. (4,80)
<b>A25</b>	2	1.56 (39,6)	.54 (13,7)	.810 ± .075 (20,57 ± 1,91)	.19 dia. (4,80)
<b>T10</b>	3	.84 (21,3)	.32 (8,1)	.600 ± .020 (15,24 ± 0,51)	—
<b>T15</b>	3	1.40 (35,6)	.32 (8,1)	.600 ± .040 (15,24 ± 1,02)	—
<b>T16</b>	3	2.34 (59,4)	.32 (8,1)	.600 ± .065 (15,24 ± 1,65)	—
<b>T18</b>	3	2.75 (69,9)	.32 (8,1)	.600 ± .080 (15,24 ± 2,03)	—
<b>T20</b>	3	1.10 (27,9)	.54 (13,7)	.600 ± .050 (15,24 ± 1,27)	—
<b>T25</b>	3	1.62 (41,1)	.54 (13,7)	.600 ± .070 (15,24 ± 1,78)	—
<b>T26</b>	3	2.57 (65,3)	.54 (13,7)	.600 ± .150 (15,24 ± 3,81)	—
<b>T28</b>	3	2.97 (75,4)	.54 (13,7)	.600 ± .187 (15,24 ± 4,75)	—
<b>T13</b>	4	1.34 (34,0)	.32 (8,1)	.810 ± .030 (20,57 ± 0,76)	.19 dia. (4,80)
<b>T14</b>	4	1.29 (32,8)	.32 (8,1)	.730 ± .030 (18,54 ± 0,76)	.19 dia. (6,40)
<b>T23</b>	4	1.56 (39,6)	.54 (13,7)	.810 ± .065 (20,57 ± 1,65)	.19 dia. (4,80)
<b>T24</b>	4	1.50 (38,1)	.54 (13,7)	.730 ± .060 (18,54 ± 1,52)	.25 dia. (6,40)
<b>WP0</b>	5	.80 (20,3)	—	.635 ± .015 (16,13 ± 0,38)	—



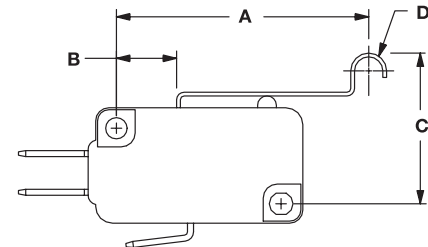
**FIG. 1**  
Pin Plunger



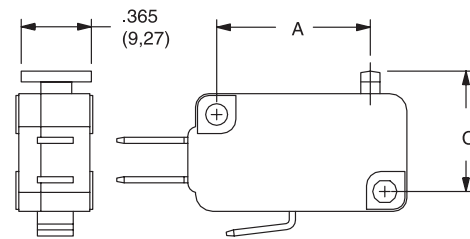
**FIG. 2**  
Lever Roller



**FIG. 3**  
Lever

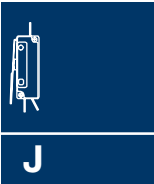


**FIG. 4**  
Simulated Roller

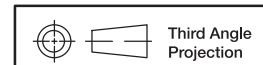


**FIG. 5**  
Wide Pin

NOTE: Switch characteristics chart on following page.



**Snap-acting**



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# TF Series Miniature Snap-acting Switches

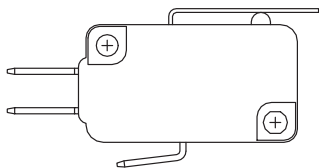
ACTUATOR 

## SWITCH CHARACTERISTICS

OPTION CODE	MAXIMUM OPERATING FORCE (OZ./GRAMS)							MINIMUM RELEASE FORCE (OZ./GRAMS)							MAXIMUM DIFFERENTIAL TRAVEL	MAXIMUM PRETRAVEL	MINIMUM OVERTRAVEL
	CC (15)	CD (25)	CF (50)	CG (75)	CJ (150)	EC (225)	EE (400)	CC (15)	CD (25)	CF (50)	CG (75)	CJ (150)	EC (225)	EE (400)	ALL FORCES	ALL FORCES	ALL FORCES
A10	.63 18	1.06 30	2.29 65	3.17 90	6.35 180	7.94 225	14.11 400	.21 6	.35 10	.35 10	.53 15	.71 20	1.98 56	3.88 110	.015 (0,38)	.060 (1,52)	.030 (0,76)
A15	.28 8	.42 12	1.06 30	1.59 45	3 85	4.59 130	7.94 225	.07 2	.14 4	.14 4	.18 5	.35 10	.71 20	2.82 80	.030 (0,76)	.100 (2,54)	.065 (1,65)
A20	0.53 15	0.71 20	1.41 40	2.12 60	4.23 120	6 170	9.7 275	0.07 2	0.11 3	0.11 3	0.18 5	0.42 12	0.71 20	1.41 40	0.025 (0,64)	0.12 (3,05)	0.055 (1,40)
A25	.18 5	.28 8	.56 16	.85 24	1.69 48	2.65 75	4.41 125	.04 1	.07 2	.07 2	.07 2	.21 6	.35 10	.71 20	.050 (1,27)	.250 (6,35)	.120 (3,05)
P00	.53 15	.88 25	1.76 50	2.65 75	5.29 150	7.94 225	14.11 400	.21 6	.35 10	.35 10	.53 15	1.23 35	1.98 56	3.88 110	.010 (0,25)	.047 (1,19)	.050 (1,27)
T10	.63 18	1.06 30	2.29 65	3.17 90	6.35 180	7.94 225	14.11 400	.21 6	.35 10	.35 10	.53 15	.71 20	1.98 56	3.88 110	.015 (0,38)	.060 (1,52)	.030 (0,76)
T13	.28 8	.42 12	1.06 30	1.59 45	3 85	4.59 130	7.94 225	.07 2	.14 4	.14 4	.18 5	.35 10	.71 20	2.82 80	.030 (0,76)	.100 (2,54)	.065 (1,65)
T14	.28 8	.42 12	1.23 35	1.76 50	3.17 90	4.76 135	7.94 225	.07 2	.14 4	.14 4	.18 5	.35 10	.71 20	2.82 80	.030 (0,76)	.100 (2,54)	.060 (1,52)
T15	.25 7	.42 12	1.06 30	1.41 40	2.82 80	4.41 125	7.94 225	.07 2	.14 4	.14 4	.18 5	.28 8	.63 18	2.82 80	.030 (0,76)	.110 (2,79)	.065 (1,65)
T16	.18 5	.28 8	.53 15	.78 22	1.59 45	2.47 70	4.23 120	.04 1	.07 2	.07 2	.07 2	.28 8	.35 10	.71 20	.045 (1,14)	.250 (6,35)	.125 (3,18)
T18	N/A	.21 6	.42 12	.71 20	1.41 40	2.12 60	3.53 100	N/A	.04 1	.04 1	.07 2	.18 5	.28 8	.56 16	.062 (1,57)	.300 (7,62)	.155 (3,94)
T20	.53 15	.71 20	1.41 40	2.12 60	4.23 120	6 170	9.70 275	.21 6	.35 10	.35 10	.53 15	.71 20	1.98 56	3.88 110	.030 (0,76)	.140 (3,56)	.060 (1,52)
T23	.18 5	.28 8	.56 16	.85 24	1.69 48	2.65 75	4.41 125	.04 1	.07 2	.07 2	.07 2	.21 6	.35 10	.71 20	.050 (1,27)	.250 (6,35)	.120 (3,05)
T24	0.18 5	0.28 8	0.56 16	0.88 25	1.76 50	2.65 75	4.76 135	0.04 1	0.07 2	0.07 2	0.11 3	0.21 6	0.35 10	0.71 20	.005 (1,27)	0.23 (5,84)	0.11 (2,79)
T25	.18 5	.28 8	.53 15	.88 25	1.59 45	2.47 70	4.23 120	.04 1	.07 2	.07 2	.07 2	.21 6	.35 10	.99 28	.055 (1,40)	.250 (6,35)	.125 (3,18)
T26	N/A	.14 4	.28 8	.42 12	.85 24	1.27 36	2.26 64	N/A	.04 1	.04 1	.05 1.5	.12 3.5	.21 6	.39 11	.100 (2,54)	.500 (12,70)	.235 (5,97)
T28	N/A	N/A	N/A	0.42 12	0.71 20	1.06 30	1.94 55	N/A	N/A	N/A	0.04 1	0.11 3	0.18 5	0.32 9	0.12 (3,05)	.0560 (14,22)	0.285 (7,24)
WP0	.53 15	.88 25	1.76 50	2.65 75	5.29 150	7.94 225	14.11 400	.21 6	.35 10	.35 10	.53 15	1.23 35	1.97 56	3.88 110	.010 (0,25)	.047 (1,19)	.030 (0,51)

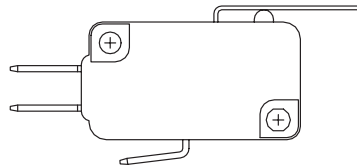
NOTE: For basic switch operating forces, see page J-6.

### HIGH FORCE, LOW MOTION PIVOT POSITION



Available with actuators A10, A15, T10, T13, T14, T15, T16 and T18.

### LOW FORCE, HIGH MOTION PIVOT POSITION



Available with actuators A20, A25, T20, T23, T24, T25, T26, and T28.

NOTE: Lever actuator options are available in either of two pivot positions. Levers located in the forward pivot position have lower forces and higher motions. Levers located in the rear pivot position have higher forces and lower motions.



Third Angle Projection

Dimensions are shown: Inch (mm)

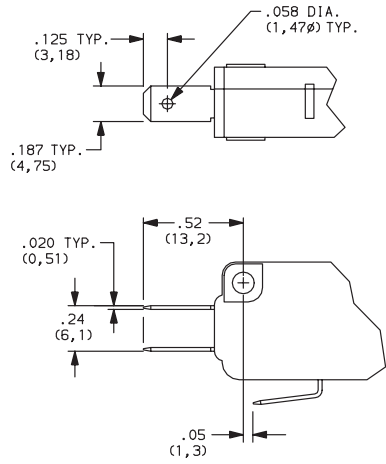
Specifications and dimensions subject to change



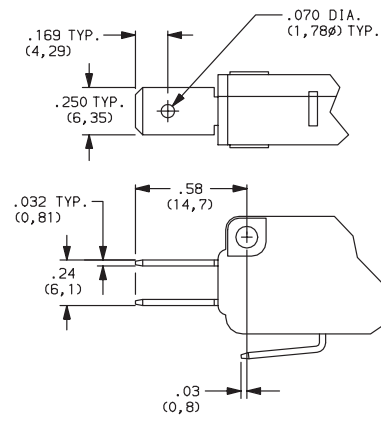
# TF Series Miniature Snap-acting Switches

## TERMINATIONS

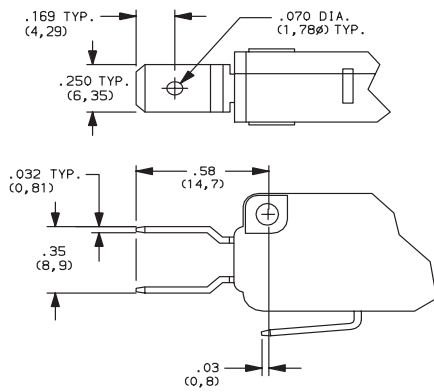
**40** .187" QUICK CONNECT



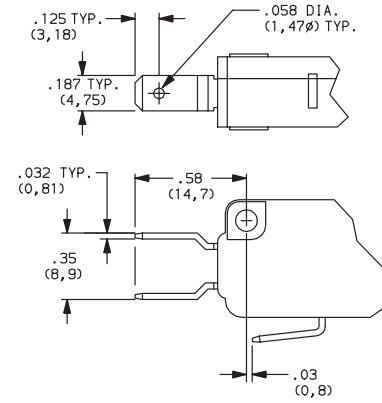
**4A** .250" QUICK CONNECT



**5A** OFFSET .250" QUICK CONNECT

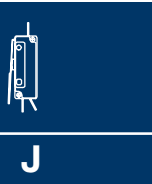


**5B** OFFSET .187" QUICK CONNECT



## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)



Snap-acting



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# TFS Series Splash Proof Miniature Snap-acting Switches



## Features/Benefits

- **Reliable snap action mechanism**
- **Low cost - high performance**
- **RoHS compatible**

## Typical Applications

- **Alarm devices / Home security**
- **Air conditioner**
- **Food processor**
- **Water heaters**
- **Industrial**
- **Forklifts**

UL61058-1  

## Specifications

CONTACT RATING / ELECTRICAL LIFE:

- 0.1A @ 125/250 V AC / 10,000 operations
- 3A @ 125/250 VAC / 10,000 operations
- 6A @ 125/250 VAC / 10,000 operations
- 10A @ 125/250 VAC / 10,000 operations

ELECTRICAL OPERATING FREQUENCY: 10-30 operations per min.

MECHANICAL LIFE: 1,000,000 operations

MECHANICAL OPERATING FREQUENCY: 120 operations per min.

INSULATION RESISTANCE: (at 500 VDC/minute) 100 M ohm min.

DIELECTRIC STRENGTH: 1500 VAC (50 -60 Hz)

OPERATING TEMPERATURE: -40°C to 85°C (with no icing)

OPERATING FORCE: 200 grams.

## Materials

CASE: Nylon

COVER: PBT

ACTUATOR: PBT

MOVABLE CONTACTS: Silver alloy

TERMINALS: Brass

LEVER: Stainless steel

WIRE: PVC+CU

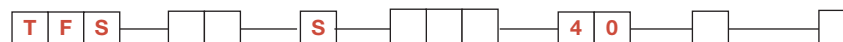
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-12 thru J-15. For additional options not shown in catalog, consult Customer Service Center.



### Electrical Rating

ELECTRICAL RATING	AMPS (GRAMS)	OPERATING FORCE				
		S (200)	D (50)	J (100)	L (150)	H (300)
01	0.1	•	•	•	•	•
03	3	•	•	•	•	•
06	6	•	•	•	•	•
10	10	•	X	X	X	•

- Available
- X Not available

### Operating Force

- S** 200 grams
- D** 50 grams
- J** 100 grams
- L** 150 grams
- H** 300 grams

### Actuator Lever Fixed

- P00** Button
- T10** Lever - high force
- T20** Lever - low force
- A05** Lever roller - High force, short lever
- A10** Lever roller - high force
- A20** Lever roller - low force
- A25** Lever roller - Low force, short lever

### Terminal Type

- 40** .187" quick connect

### Circuit Arrangement

- C** SPDT
- Y** SPST N.O.
- W** SPST N.C.

### Mounting Hole Size

- NONE** 3.1 mm (3 mm screw clearance hole)
- S** 2.9 mm (4-40 screw clearance hole)

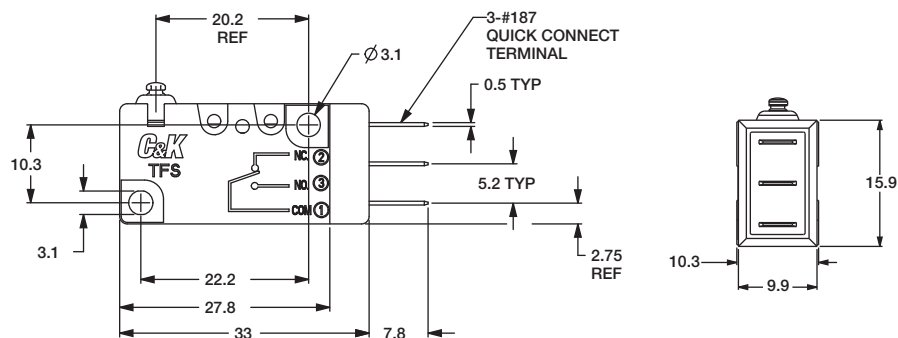




# TFS Series Splash Proof Miniature Snap-acting Switches

## SERIES

**TFS** SUB-MINIATURE SNAP-ACTING SWITCHES



## ELECTRICAL RATING

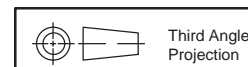
OPTION CODE	RoHS COMPLIANT	RoHS COMPATIBLE	ELECTRICAL RATING
<b>10</b>	Yes	Yes	10A @ 125/250 V AC / 10,000 operations
<b>06</b>	Yes	Yes	6A @ 125/250 VAC / 10,000 operations
<b>03</b>	Yes	Yes	3A @ 125/250 VAC / 10,000 operations
<b>01</b>	Yes	Yes	0.1A @ 125/250 VAC / 10,000 operations



Snap-acting

## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE
<b>S</b>	200 GRAMS
<b>D</b>	50 grams
<b>J</b>	100 grams
<b>L</b>	150 grams
<b>H</b>	300 grams

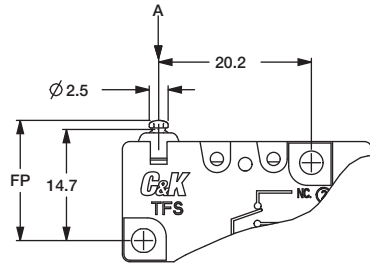


Dimensions are shown: mm  
Specifications and dimensions subject to change

# TFS Series Splash Proof Miniature Snap-acting Switches

## ACTUATOR

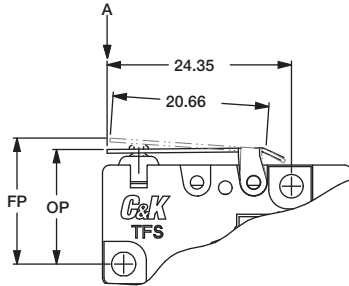
**P00** BUTTON



Measure at Point "A"

Max. operating force	200 grams
Min. release force	30 grams
Operating position OP	14.7 ± 0.4 mm
Max. movement differential	0.4 mm
Min. over travel OT	1.0 mm
Max. pre-travel PT	1.2 mm

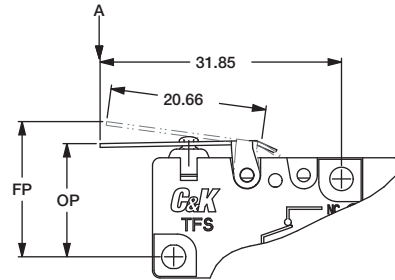
**T10** LEVER, HIGH FORCE



Measure at Point "A"

Max. operating force	160 grams
Min. release force	25 grams
Operating position OP	15.1 ± 0.6 mm
Max. movement differential	0.6 mm
Min. over travel OT	1.1 mm
Max. pre-travel PT	2.6 mm

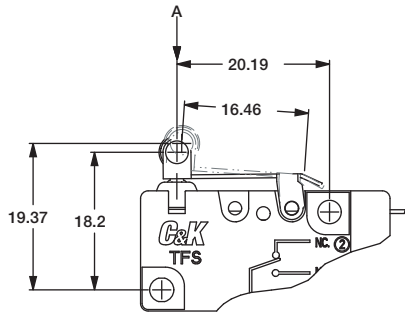
**T20** LEVER, LOW FORCE



Measure at Point "A"

Max. operating force	90 grams
Min. release force	10 grams
Operating position OP	15 ± 1.1 mm
Max. movement differential	1.1 mm
Min. over travel OT	1.2 mm
Max. pre-travel PT	5.1 mm

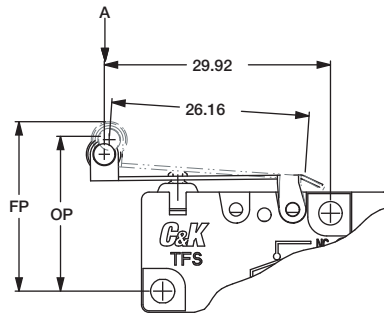
**A05** LEVER ROLLER  
HIGH FORCE, SHORT LEVER



Measure at Point "A"

Max. operating force	200 grams
Min. release force	30 grams
Operating position OP	20.6 ± 0.5 mm
Max. movement differential	0.5 mm
Min. over travel OT	1.0 mm
Max. pre-travel PT	2.1 mm

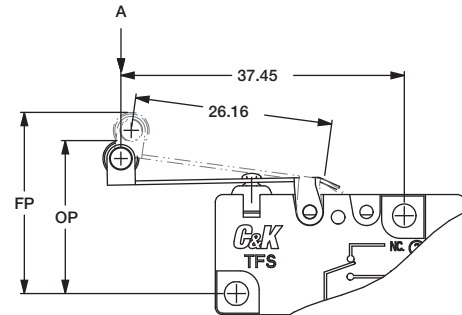
**A10** LEVER ROLLER  
HIGH FORCE



Measure at Point "A"

Max. operating force	130 grams
Min. release force	20 grams
Operating position OP	20.4 ± 0.7 mm
Max. movement differential	0.7 mm
Min. over travel OT	1.3 mm
Max. pre-travel PT	3.3 mm

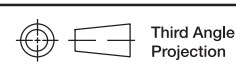
**A20** LEVER ROLLER  
LOW FORCE



Measure at Point "A"

Max. operating force	70 grams
Min. release force	10 grams
Operating position OP	20.2 ± 1.2 mm
Max. movement differential	1.4 mm
Min. over travel OT	1.5 mm
Max. pre-travel PT	6.5 mm

Snap-acting



Third Angle  
Projection

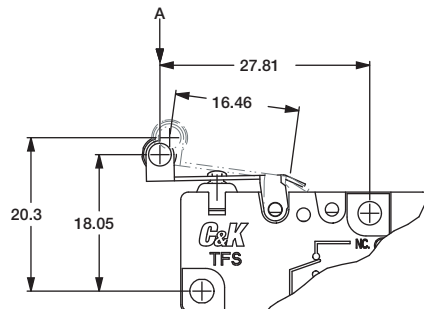
Dimensions are shown: mm  
Specifications and dimensions subject to change



# TFS Series Splash Proof Miniature Snap-acting Switches

## ACTUATOR

**A25** LEVER ROLLER  
LOW FORCE, SHORT LEVER

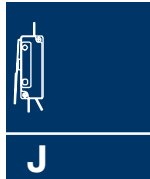
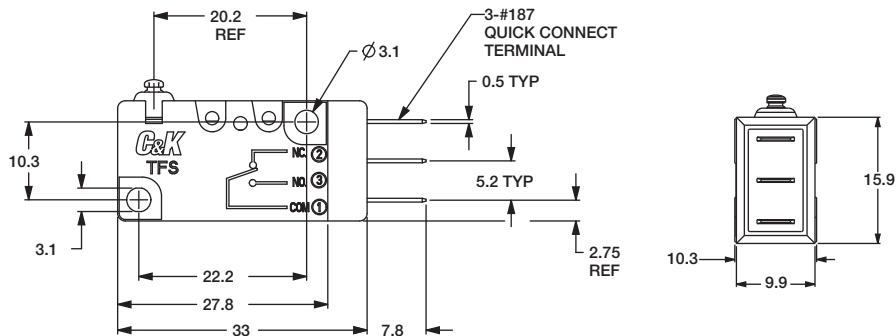


Measure at Point "A"

Max. operating force	150 grams
Min. release force	15 grams
Operating position OP	20.4 ± 0.9 mm
Max. movement differential	0.9 mm
Min. over travel OT	1.2 mm
Max. pre-travel PT	4.2 mm

## TERMINAL TYPE

**40** .187" QUICK CONNECT



Snap-acting

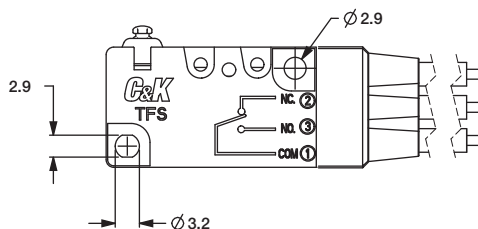
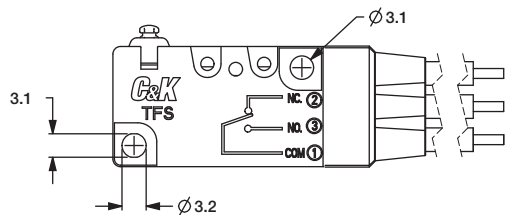
## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)

## MOUNTING HOLE SIZE

**NONE** 3.1 mm (3mm SCREW CLEARANCE HOLE)

**S** 2.9 mm (4-40 SCREW CLEARANCE HOLE)



Third Angle  
Projection  
Dimensions are shown: mm  
Specifications and dimensions subject to change

**C&K**

# TFS Series Sealed Miniature Snap-acting Switches (Water Proof)



## Features/Benefits

- IP67
- Reliable snap action mechanism
- Low cost - high performance
- RoHS compatible

## Typical Applications

- Alarm devices / Home security
- Air conditioner
- Food processor
- Water heaters
- Industrial
- Forklifts

UL61058-1



## Specifications

CONTACT RATING / ELECTRICAL LIFE:

- 0.1A @ 125/250 V AC / 10,000 operations
- 3A @ 125/250 VAC / 10,000 operations
- 6A @ 125/250 VAC / 10,000 operations
- 10A @ 125/250 VAC / 10,000 operations

ELECTRICAL OPERATING FREQUENCY: 10-30 operations per min.

MECHANICAL LIFE: 1,000,000 operations

MECHANICAL OPERATING FREQUENCY: 120 operations per min.

INSULATION RESISTANCE: (at 500 VDC/minute) 100 M ohm min.

DIELECTRIC STRENGTH: 1500 VAC (50 -60 Hz)

OPERATING TEMPERATURE: see wire type

OPERATING FORCE: 200 grams.

## Materials

CASE: Nylon

COVER: PBT

ACTUATOR:PBT

MOVABLE CONTACTS: Silver alloy.

TERMINALS: Brass.

LEVER: Stainless steel

WIRE: PVC+CU

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-17 thru J-19. For additional options not shown in catalog, consult Customer Service Center.

**Electrical Rating**  
see chart below

**Operating Force**

- S** 200 grams
- D** 50 grams
- J** 100 grams
- L** 150 grams
- H** 300 grams

**Actuator Lever Fixed**

- P00** Button
- T10** Lever - high force
- T20** Lever - low force
- A05** Lever roller - High force, short lever
- A10** Lever roller - high force
- A20** Lever roller - low force
- A25** Lever roller - Low force, short lever

**Terminal Type**

- W** Wire

**Circuit Arrangement**

- C** SPDT
- Y** SPST N.O.
- W** SPST N.C.

**Wire UL #**

- B** UL1015 (T55)

**Wire Type**

- C** 16 AWG
- D** 18 AWG
- E** 20 AWG
- F** 22 AWG
- G** 24 AWG
- H** 26 AWG

**Mounting Hole Size**

- NONE** 3.1 mm (3 mm screw clearance hole)
- S** 2.9 mm (4-40 screw clearance hole)

**OPERATING TEMPERATURE**

-40°C to + 85°C (with UL1015 wire)

ELECTRICAL RATING	AMPS	WIRE TYPE				
		C 16AWG	D 18AWG	E 20AWG	F 22AWG	G 24AWG H 26AWG
01	0.1	•	•	•	•	•
03	3	•	•	•	X	X
06	6	•	•	X	X	X
10	10	•	X	X	X	X

• Available  
X Not available

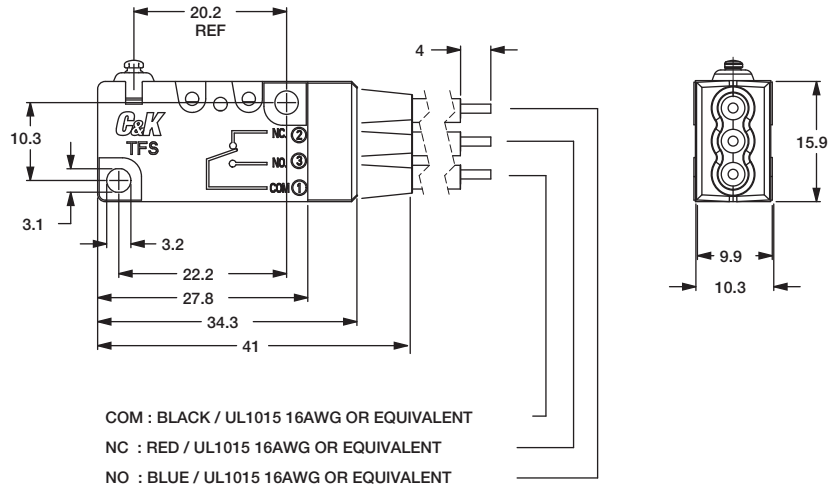


Dimensions are shown: mm  
Specifications and dimensions subject to change

# TFS Series Sealed Miniature Snap-acting Switches (Water Proof)

## SERIES

**TFS** SUB-MINIATURE SNAP-ACTING SWITCHES – WATERPROOF

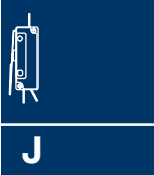


## ELECTRICAL RATING

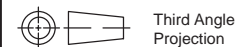
OPTION CODE	RoHS COMPLIANT	RoHS COMPATIBLE	ELECTRICAL RATING
<b>10</b>	Yes	Yes	10A @ 125/250 V AC / 10,000 operations
<b>06</b>	Yes	Yes	6A @ 125/250 VAC / 10,000 operations
<b>03</b>	Yes	Yes	3A @ 125/250 VAC / 10,000 operations
<b>01</b>	Yes	Yes	0.1A @ 125/250 VAC / 10,000 operations

## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE
<b>S</b>	200 GRAMS
<b>D</b>	50 grams
<b>J</b>	100 grams
<b>L</b>	150 grams
<b>H</b>	300 grams



Snap-acting



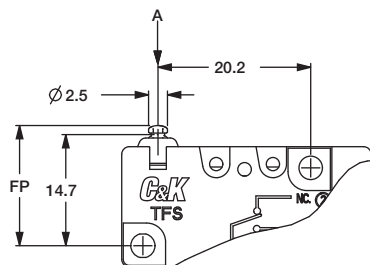
Third Angle Projection

Dimensions are shown: mm  
 Specifications and dimensions subject to change

# TFS Series Sealed Miniature Snap-acting Switches (Water Proof)

## ACTUATOR

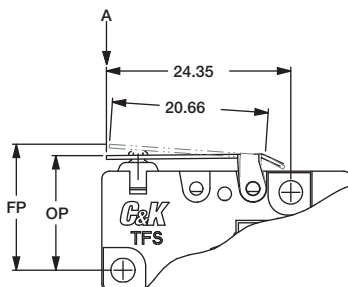
**P00** BUTTON



Measure at Point "A"

Max. operating force	200 grams
Min. release force	30 grams
Operating position OP	14.7 ± 0.4 mm
Max. movement differential	0.4 mm
Min. over travel OT	1.0 mm
Max. pre-travel PT	1.2 mm

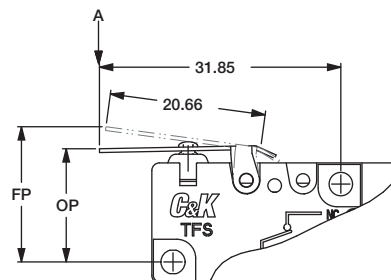
**T10** LEVER, HIGH FORCE



Measure at Point "A"

Max. operating force	160 grams
Min. release force	25 grams
Operating position OP	15.1 ± 0.6 mm
Max. movement differential	0.6 mm
Min. over travel OT	1.1 mm
Max. pre-travel PT	2.6 mm

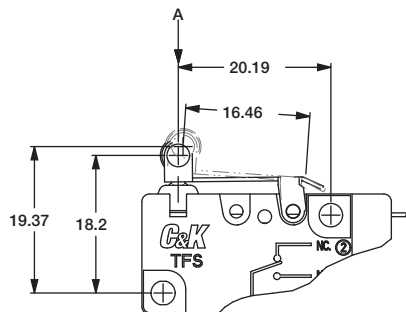
**T20** LEVER, LOW FORCE



Measure at Point "A"

Max. operating force	90 grams
Min. release force	10 grams
Operating position OP	15 ± 1.1 mm
Max. movement differential	1.1 mm
Min. over travel OT	1.2 mm
Max. pre-travel PT	5.1 mm

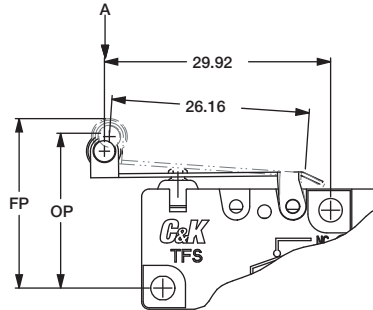
**A05** LEVER ROLLER  
HIGH FORCE, SHORT LEVER



Measure at Point "A"

Max. operating force	200 grams
Min. release force	30 grams
Operating position OP	20.6 ± 0.5 mm
Max. movement differential	0.5 mm
Min. over travel OT	1.0 mm
Max. pre-travel PT	2.1 mm

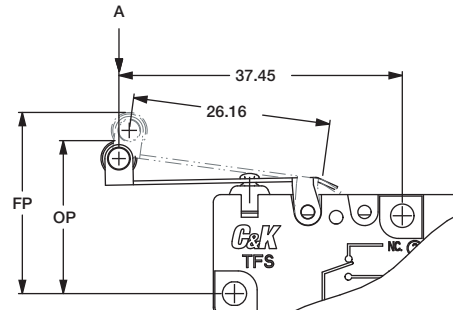
**A10** LEVER ROLLER  
HIGH FORCE



Measure at Point "A"

Max. operating force	130 grams
Min. release force	20 grams
Operating position OP	20.4 ± 0.7 mm
Max. movement differential	0.7 mm
Min. over travel OT	1.3 mm
Max. pre-travel PT	3.3 mm

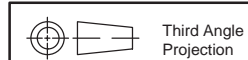
**A20** LEVER ROLLER  
LOW FORCE



Measure at Point "A"

Max. operating force	70 grams
Min. release force	10 grams
Operating position OP	20.2 ± 1.2 mm
Max. movement differential	1.4 mm
Min. over travel OT	1.5 mm
Max. pre-travel PT	6.5 mm

Snap-acting



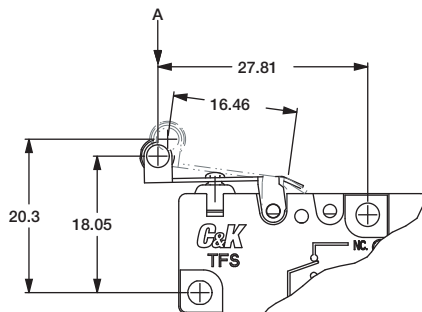
Third Angle  
Projection

Dimensions are shown: (mm)  
Specifications and dimensions subject to change

# TFS Series Sealed Miniature Snap-acting Switches (Water Proof)

## ACTUATOR

**A25** LEVER ROLLER  
LOW FORCE, SHORT LEVER

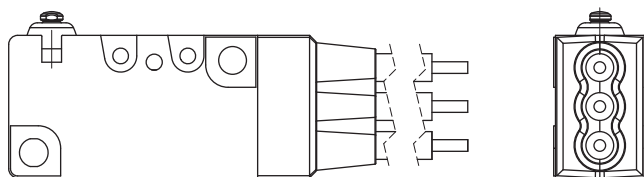


Measure at Point "A"

Max. operating force	150 grams
Min. release force	15 grams
Operating position OP	20.4 ± 0.9 mm
Max. movement differential	0.9 mm
Min. over travel OT	1.2 mm
Max. pre-travel PT	4.2 mm

## TERMINAL TYPE

**W** WIRE UL1015



Snap-acting

## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)

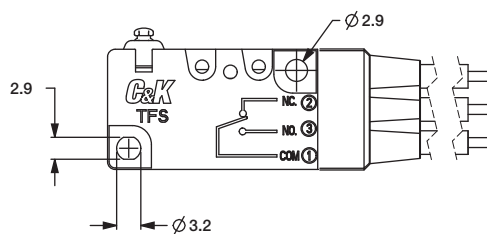
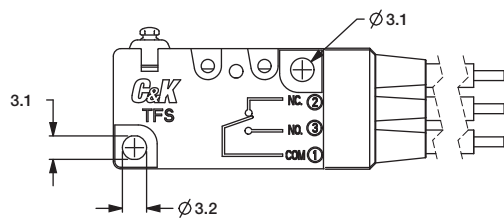
## WIRE TYPE

- C** 16 AWG
- D** 18 AWG
- E** 20 AWG
- F** 22 AWG
- G** 24 AWG
- H** 26 AWG

## MOUNTING HOLE SIZE

**NONE** 3.1 mm (3mm SCREW CLEARANCE HOLE)

**S** 2.9 mm (4-40 SCREW CLEARANCE HOLE)



Third Angle Projection

Dimensions are shown: (mm)  
Specifications and dimensions subject to change



# TF2 Series Miniature Snap-acting Switches



## Features/Benefits

- Broad range of operating forces
- Ratings up to 10 AMPS
- Wide variety of actuator styles
- Quick connect terminations

## Typical Applications

- Motor controls
- Thermostatics
- Portable tools
- Air Conditioner



## Specifications

CONTACT RATING: From low level\* to 10 AMPS @125/250 V AC.

ELECTRICAL LIFE: 10,000 cycles

MECHANICAL LIFE: 1,000,000 cycles at 0.1A and 6A  
400,000 cycles at 10A

INSULATION RESISTANCE: 1,000 M ohm min.

DIELECTRIC STRENGTH: 1,500 Vrms min. @ sea level.

OPERATING TEMPERATURE: -40°C to 125°C (-40°C to 85°C).

OPERATING FORCE: From 18 to 330 grams at actuator button available.

MOUNTING: Torque screws 2-5 in/lbs.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max. Standard electrical life per UL 1054, rated for 6,000 operations.

## Materials

SWITCH HOUSING: Nylon 6/6

ACTUATOR BUTTON: Nylon 6/6

SPRING: Stainless Steel

PIVOT: Brass Alloy

MOVABLE CONTACTS: See electric rating page J-21

MOVABLE BLADE: BeCu

STATIONARY CONTACTS: See electric rating page J-21

TERMINALS: Brass Alloy

**NOTE:** Specifications and materials listed above are switches with standard options. For information on specific and custom switches, consult Customer Service Center.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-21 through J-25. For additional options not shown in catalog, consult Customer Service Center.

Series **TF2** SP, Mom.

Operating Force  
**CC** 18 grams  
**CF** 45 grams  
**CG** 75 grams  
**CH** 110 grams  
**CJ** 170 grams  
**EC** 230 grams  
**EE** 330 grams

Electrical Rating Chart

OPTION CODE	UL US 61058-1	ENEC 15
<b>F5</b>	0.1A 125/250 V AC (T85) Min. 10,000 operations	0.1A 125/250 V AC μT125, 1E4
<b>H8</b>	6A 125/250 V AC (T85) Min. 10,000 operations	6A 125/250 V AC μT125, 1E4
<b>K6</b>	10A 125/250 V AC (T85) Min. 10,000 operations	10(4)A 125/250 V AC μT125, 1E4

Mounting Style  
**S** Standard  
**V** Metric

Actuator  
**P00** Pin plunger  
**A10** Lever roller 12.5 mm  
**A15** Lever roller 25.9 mm  
**A20** Lever roller 12.5 mm  
**A25** Lever roller 25.9 mm  
**T10** Lever 14 mm  
**T14** Simulated roller 24.5 mm  
**T15** Lever 27.5 mm  
**T16** Lever 31.7 mm  
**T17** Lever 35 mm  
**T20** Lever 14 mm  
**T24** Simulated lever 24.5 mm  
**T25** Lever 27.5 mm  
**T26** Lever 31.7 mm  
**T27** Lever 35 mm

Circuitry  
**C** SPDT  
**W** SPST N.C.  
**Y** SPST N.O.

Terminations  
**40** .187" quick connect  
**4A** .250" quick connect  
**5A** .250" off set quick connect  
**5B** .187" off set quick connect  
**60** Screw style \*  
**10** Solder

\* Note: No UL & ENEC 15 safety for Termination option "60"

see chart on following pages for detailed information



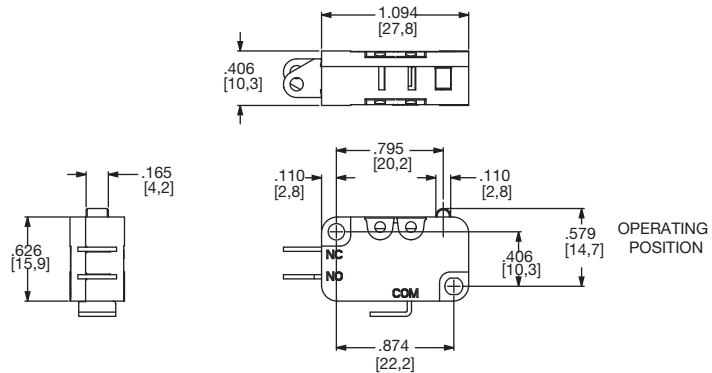
Dimensions are shown: mm  
Specifications and dimensions subject to change



# TF2 Series Miniature Snap-acting Switches

## SERIES

**TF2** MINIATURE SNAP-ACTING SWITCHES



## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE (grams)
<b>CC</b>	18
<b>CF</b>	45
<b>CG</b>	75
<b>CH</b>	110
<b>CJ</b>	170
<b>EC</b>	230
<b>EE*</b>	330

\*Minimums may apply, consult Customer Service Center.

## ELECTRICAL RATING

OPTION CODE	CONTACT MATERIAL		MOVABLE CONTACT	STATIONARY CONTACT
	RoHS COMPLIANT *	RoHS COMPATIBLE *		
<b>F5</b>	Yes	Yes	Silver alloy	Silver alloy
<b>H8</b>	Yes	Yes		
<b>K6</b>	Yes	Yes		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

All models  



Dimensions are shown: inches (mm)  
Specifications and dimensions subject to change

[www.ck-components.com](http://www.ck-components.com)



# TF2 Series Miniature Snap-acting Switches

## ELECTRICAL RATING

INTERNATIONAL RATING SYMBOLS	
μ	Microgap construction (less than 3 mm).
~	Alternating current.
T__	Maximum rated use temperature.
50E3	Cycles over 50,000 at rated current.
10E3	Cycles over 10,000 at rated current.
10(3)	Current Rating: First number represents resistive rating; second number represents inductive (motor) rating.

ELECTRICAL RATING	AMPS (REF.)	OPERATING FORCE						
		CC (18)	CF (45)	CG (75)	CH (110)	CJ (170)	EC (230)	EE (330)
F5	0.1	•	•	•	•	•	•	X
H8	6	X	•	•	•	•	•	•
K6	10	X	X	X	•	•	•	•

• AVAILABLE  
X NOT AVAILABLE



Snap-acting

All models

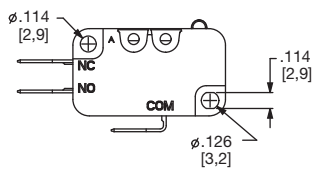
Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

## MOUNTING STYLE

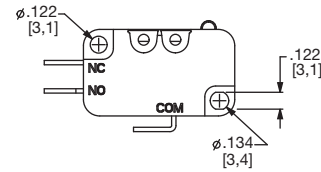
**S** STANDARD  
For 4-40 screw size

**V** Metric  
For 3 mm screw size



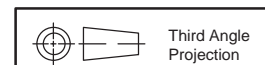
TF2 SWITCH WITH TYPE 40 (.187 QC) TERMINALS AND P00 ACTUATOR SHOWN

NOTE: TORQUE MOUNTING SCREWS 2-5 IN/LBS.



TF2 SWITCH WITH TYPE 10 (SOLDER) TERMINALS AND P00 ACTUATOR SHOWN

NOTE: TORQUE MOUNTING SCREWS 2-5 IN/LBS.



Dimensions are shown: inches (mm)  
Specifications and dimensions subject to change

# TF2 Series Miniature Snap-acting Switches

## ACTUATOR

OPTION CODE	FIG	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
P00	2	.795 (20,2)	-	.578 ± .019 (14,70 ± 0,05)	0.068 (1,72)	-
A10	1	.822 (20,9)	.33 (8,4)	.816 ± .050 (20,73 ± 1,27)	.106 (2,70)	∅.19 (∅ 4,8)
A15	1	1.35 (34,3)	.33 (8,4)	.816 ± .059 (20,73 ± 1,5)	.165 (4,20)	∅.19 (∅ 4,8)
A20	1	1.05 (26,8)	.56 (14,3)	.816 ± .050 (20,73 ± 1,27)	.183 (4,65)	∅.19 (∅ 4,8)
A25	1	1.58 (40,2)	.56 (14,3)	.816 ± .086 (20,73 ± 2,2)	.366 (9,30)	∅.19 (∅ 4,8)
T10	3	.882 (22,39)	.33 (8,4)	.602 ± .020 (15,3 ± 0,50)	.110 (2,80)	-
T14	4	1.295 (32,9)	.33 (8,4)	.737 ± .059 (18,72 ± 1,5)	.216 (5,50)	∅.275 (∅ 7,0)
T15	3	1.405 (35,69)	.33 (8,4)	.600 ± .059 (15,24 ± 1,5)	.232 (5,90)	-
T16	3	1.58 (40,01)	.33 (8,4)	.604 ± .068 (15,35 ± 1,75)	.196 (5,0)	-
T17	3	1.708 (43,39)	.33 (8,4)	.603 ± .062 (15,33 ± 1,57)	.216 (5,50)	-
T20	3	1.11 (28,3)	.56 (14,3)	.604 ± .045 (15,34 ± 1,14)	.204 (5,20)	-
T24	4	1.527 (38,8)	.56 (14,3)	.742 ± .090 (18,84 ± 2,29)	.342 (8,70)	∅.275 (∅ 7,0)
T25	3	1.631 (41,43)	.56 (14,3)	.609 ± .090 (15,47 ± 2,3)	.381 (9,70)	-
T26	3	1.811 (46,00)	.56 (14,3)	.616 ± .125 (15,65 ± 3,18)	.389 (9,90)	-
T27	3	1.94 (49,3)	.56 (14,3)	.598 ± .150 (15,2 ± 3,8)	.433 (11,0)	-

NOTE: Switch characteristics chart on following page.

### Lever Roller

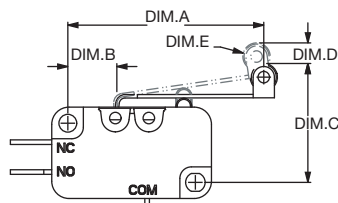


FIG. 1  
LEVER ROLLER  
TF2XXXXMA1510C

### Pin Roller

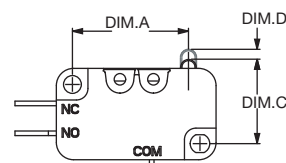


FIG. 2  
PIN ROLLER  
TF2XXXXMP0010C

### Lever

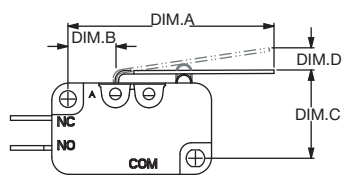


FIG. 3  
LEVER  
TF2XXXXST1510C SHOWN

### Simulated Roller

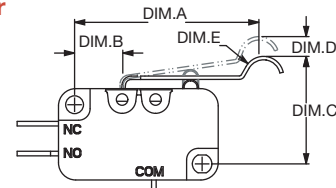


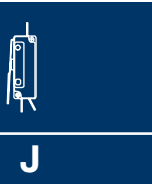
FIG. 4  
SIMULATED ROLLER  
TF2XXXXST1410C



Third Angle  
Projection

Dimensions are shown: inches (mm)  
Specifications and dimensions subject to change

**C&K**



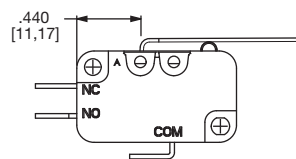
Snap-acting

# TF2 Series Miniature Snap-acting Switches

ACTUATOR 

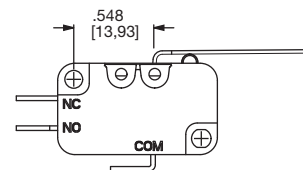
Lever Type		CC	CF	CG	CH Grams	CJ	EC	EE	Pre-Travel max. mm	Max Differential max. mm	Over Travel Min. mm
P00	OF	18	45	75	110	170	230	330	1.72	0.4	0.8
	RF	3	7	14	20	34	42	60			
T10	OF	18	45	75	110	170	230	330	2.8	0.5	0.6
	RF	-	6	11	17	25	35	50			
T20	OF	8	27	43	50	85	120	175	5.2	0.9	1.55
	RF	-	3	5	7	13	17	25			
T14	OF	10	28	43	65	110	140	205	5.5	1.1	1.4
	RF	-	3	5	8	14	17	31			
T24	OF	7	16	24	35	56	70	100	8.7	1.7	3.2
	RF	-	-	-	4	5	9	12			
A10	OF	20	55	80	110	170	230	330	2.7	0.45	0.6
	RF	-	5	11	16	28	31	45			
A20	OF	8	35	55	70	100	120	175	4.65	0.8	1.4
	RF	-	3	5	7	14	18	28			
A15	OF	8	30	45	65	100	125	180	4.2	1.25	1.6
	RF	-	-	5	7	12	16	25			
A25	OF	7	20	30	40	51	65	90	9.3	1.8	2.8
	RF	-	-	-	-	6	8	9			
T17	OF	16	25	35	50	80	100	140	5.5	1.2	0.55
	RF	-	2	4	6	11	14	20			
T27	OF	13	18	24	32	45	55	90	11	2.3	3.6
	RF	-	-	2	3	5	7	10			
T16	OF	15	17	32	55	85	110	150	5	1.05	1.8
	RF	-	-	4	6	12	15	22			
T26	OF	10	12	18	35	45	65	90	9.9	2.05	3.6
	RF	-	-	2	4	6	8	11			
T15	OF	18	22	37	50	86	125	180	5.9	1	1.6
	RF	-	3	5	9	14	17	24			
T25	OF	5	16	25	30	51	65	90	9.7	2.2	3.1
	RF	-	-	3	4	6	8	11			

HIGH FORCE, LOW MOTION PIVOT POSITION



Available with actuators A10, A15, T10, T13, T14, T15, T16 and T18.

LOW FORCE, HIGH MOTION PIVOT POSITION



Available with actuators A20, A25, T20, T23, T24, T25, T26, and T28.

**NOTE:** Lever actuator options are available in either of two pivot positions. Levers located in the forward pivot position have lower forces and higher motions. Levers located in the rear pivot position have higher forces and lower motions.



Third Angle  
Projection

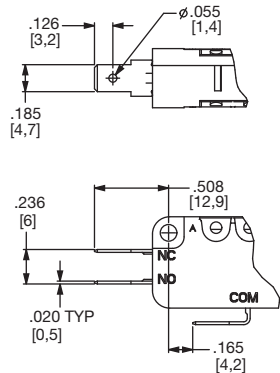
Dimensions are shown: mm  
Specifications and dimensions subject to change



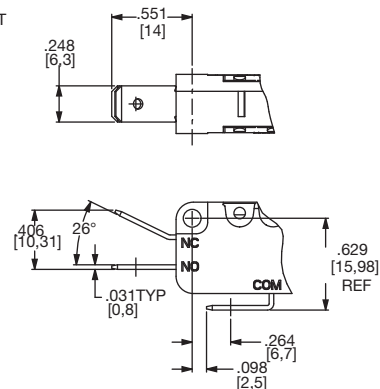
# TF2 Series Miniature Snap-acting Switches

## TERMINATIONS

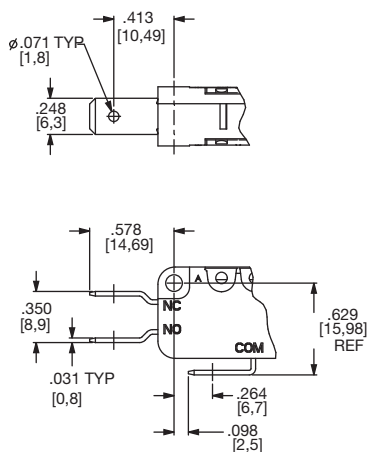
**40** .187" QUICK CONNECT



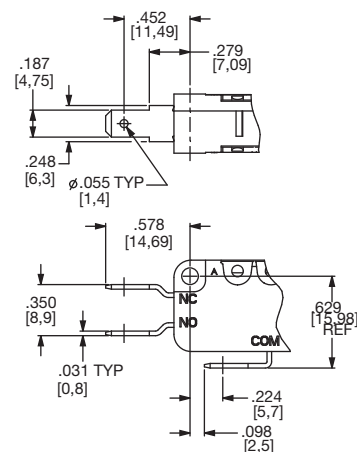
**4A** .250" QUICK CONNECT



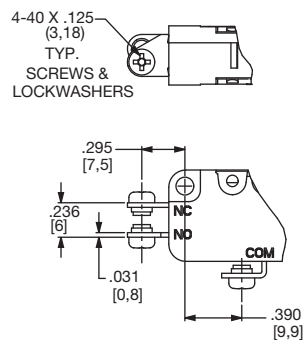
**5A** .250" OFF SET QUICK CONNECT



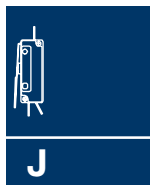
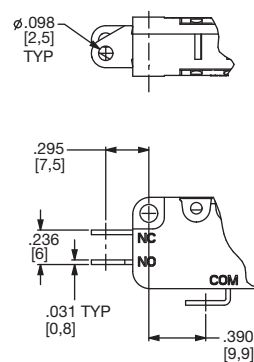
**5B** .187" OFF SET QUICK CONNECT



**60** SCREW STYLE



**10** SOLDER



Snap-acting

## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)



Third Angle Projection  
Dimensions are shown: inches (mm)  
Specifications and dimensions subject to change



# TM Series Miniature Snap-acting Switches



## Features/Benefits

- Broad range of operating forces available
- Wide variety of actuator and terminal styles
- Cost-effective solution

## Typical Applications

- Pumps and motors
- White goods
- Consumer appliances



## Specifications

CONTACT RATING: From low level\* to 15 AMPS @ 250 V AC.  
 ELECTRICAL LIFE: 150,000 cycles at 15 AMPS @ 250 V AC, models with 150 grams operating force. 350,000 cycles at 10 AMPS @ 250 V AC, models with 75 grams operating force.  
 INSULATION RESISTANCE: 1,000 M ohms min.  
 DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -67°F to 302°F (-55°C to 150°C).  
 OPERATING FORCE: 50, 75 and 150 grams at actuator available; refer to chart for lever style forces.  
 MOUNTING: Torque screws 2-5 in/lbs.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

## Materials

SWITCH HOUSING: Thermoplastic or general purpose phenolic (UL 94V-0).  
 ACTUATOR BUTTON: Thermoplastic (UL 94V-0).  
 SPRING: Copper alloy.  
 PIVOT: Brass alloy.  
 MOVABLE CONTACTS: Gold alloy for ratings 1 AMP @ 125 V AC or less. Fine silver for ratings greater than 1 AMP @ 125 V AC.  
 STATIONARY CONTACTS: Gold alloy for ratings 1 AMP or less. Fine silver for ratings greater than 1 AMP.  
 TERMINALS: Brass alloy for ratings up to 10 AMPS @ 250 V AC. Copper alloy for 15 AMPS @ 250 V AC ratings.

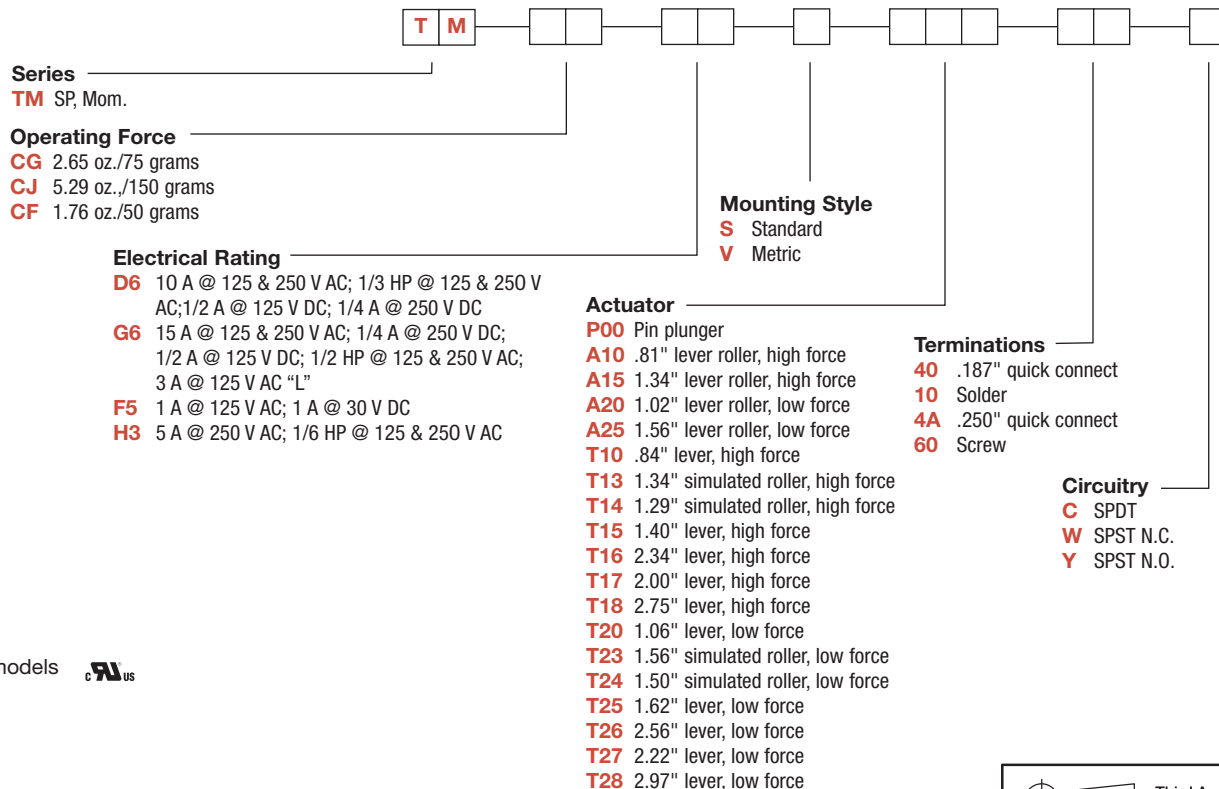
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



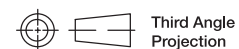
Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-26 through J-31. For additional options not shown in catalog, consult Customer Service Center. Available extended electrical life per UL 1054, rated for 100,000 operations, consult factory.



\* All models

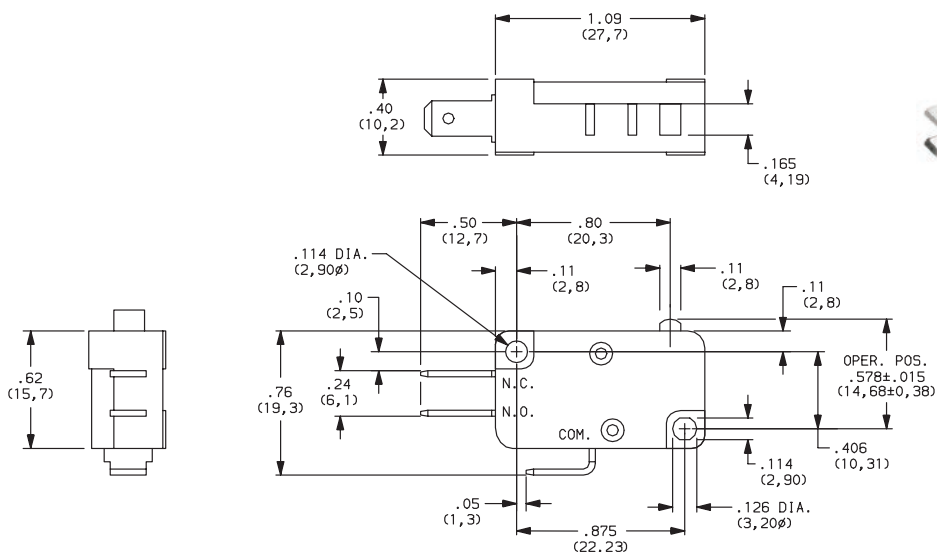


Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

# TM Series Miniature Snap-acting Switches

## SERIES

**TM** MINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY



## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
<b>CG</b>	2.65 75
<b>CJ</b>	5.29 150
<b>CF</b>	1.76 50

Operating Force option 'CF' not available with 'T18, T27 and T28' actuator options. Operating force varies with actuator option, see ACTUATOR option section.

## ELECTRICAL RATING

OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL		ELECTRICAL RATING
			MOVABLE CONTACT	STATIONARY CONTACT	
<b>D6</b>	Yes	Yes	Fine Silver	Fine Silver	10 AMPS @ 125 & 250 V AC; 1/3 HP @ 125 & 250 V AC; 1/2 AMP @ 125 V DC; 1/4 AMP @ 250 V DC.
<b>F5</b>	Yes	Yes	Gold alloy	Gold alloy	From low level* to 1 AMP @ 125 V AC, 1 AMP @ 30 V DC.
<b>G6</b>	Yes	Yes	Fine Silver	Fine Silver	15 AMPS @ 125 & 250 V AC; 0.25 AMP @ 250 V DC; 0.5 AMP @ 125 V DC; 1/2 HP @ 125 & 250 V AC; 3 AMPS @ 125 V AC "L".
<b>H3</b>	Yes	Yes			5 AMPS @ 250 V AC; 1/6 HP @ 125 & 250 V AC.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

\* All models US

Contact Customer Service Center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



Snap-acting

# TM Series Miniature Snap-acting Switches

## ELECTRICAL RATING

### AVAILABLE COMBINATIONS

ELECTRICAL RATING	MAXIMUM OPERATING FORCE (OZ./GRAMS)		
	1.76/50 CF	2.65/75 CG	5.29/150 CJ
D6	•	•	•
F5	•	•	•
G6	X	X	•
H3	•	•	•

• AVAILABLE  
X NOT AVAILABLE



\* All models US

Contact Customer Service Center for availability and delivery of nonstandard ratings.

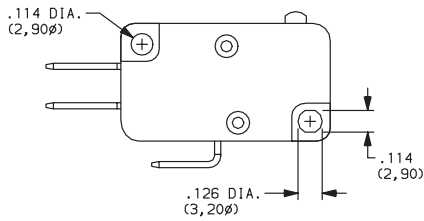
\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

## MOUNTING STYLE

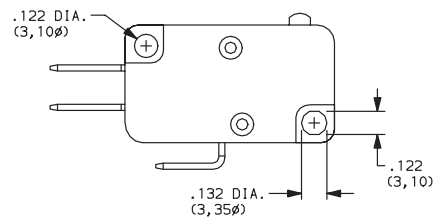
Snap-acting

**S** Standard

**V** Metric



Recommended maximum screw size: 4-40.



Recommended maximum screw size: 3 mm.

**NOTE:** Torque mounting screws 2-5 in/lbs.



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# TM Series Miniature Snap-acting Switches

## ACTUATOR

OPTION CODE	FIG.	DIM. A	DIM. B	DIM. C	DIM. D
<b>P00</b>	2	.80 (20,3)	—	.578 ± .015 (14,68 ± 0,38)	—
<b>A10</b>	1	.81 (20,6)	.36 (9,1)	.810 ± .020 (20,57 ± 0,51)	.19 dia. (4,80)
<b>A15</b>	1	1.34 (34,0)	.36 (9,1)	.810 ± .040 (20,57 ± 1,02)	.19 dia. (4,80)
<b>A20</b>	1	1.03 (26,2)	.58 (14,7)	.810 ± .050 (20,57 ± 1,27)	.19 dia. (4,80)
<b>A25</b>	1	1.56 (39,6)	.58 (14,7)	.810 ± .080 (20,57 ± 2,03)	.19 dia. (4,80)
<b>T10</b>	3	.84 (21,3)	.36 (9,1)	.600 ± .020 (15,24 ± 0,51)	—
<b>T13</b>	4	1.34 (34,0)	.36 (9,1)	.810 ± .040 (20,57 ± 1,02)	.19 dia. (4,80)
<b>T14</b>	4	1.28 (32,5)	.36 (9,1)	.743 ± .050 (18,9 ± 1,3)	.236 dia. (6,00)
<b>T15</b>	3	1.40 (35,6)	.36 (9,1)	.600 ± .040 (15,24 ± 1,02)	—
<b>T16</b>	3	2.34 (59,4)	.36 (9,1)	.600 ± .062 (15,24 ± 1,57)	—
<b>T17</b>	3	2.00 (50,8)	.36 (9,1)	.600 ± .052 (15,24 ± 1,57)	—
<b>T18</b>	3	2.75 (69,9)	.36 (9,1)	.600 ± .093 (15,24 ± 2,36)	—
<b>T20</b>	3	1.06 (26,9)	.58 (14,7)	.600 ± .045 (15,24 ± 1,14)	—
<b>T23</b>	4	1.56 (39,6)	.58 (14,7)	.810 ± .065 (20,57 ± 1,65)	.19 dia. (4,80)
<b>T24</b>	4	1.50 (38,1)	.58 (14,7)	.743 ± .090 (18,80 ± 2,29)	.236 dia. (6,00)
<b>T25</b>	3	1.62 (41,1)	.58 (14,7)	.600 ± .080 (15,24 ± 2,03)	—
<b>T26</b>	3	2.56 (65,0)	.56 (14,7)	.600±.125 (15,24±3.18)	—
<b>T27</b>	3	2.22 (56,4)	.58 (14,7)	.600±.125 (15,24±3.18)	—
<b>T28</b>	3	2.97 (75,4)	.58 (14,7)	.600±.187 (15,24±4.75)	—

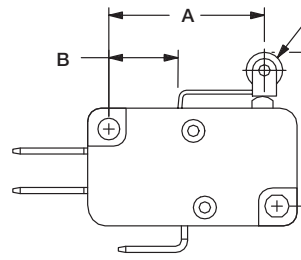


FIG. 1  
Lever Roller

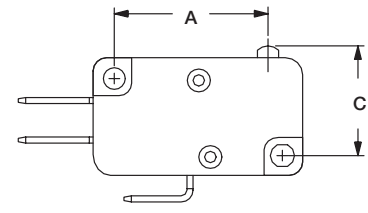


FIG. 2  
Pin Roller

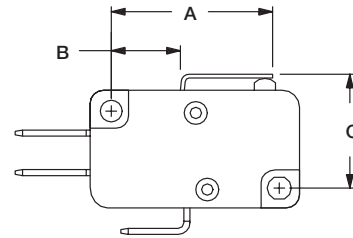


FIG. 3  
Lever

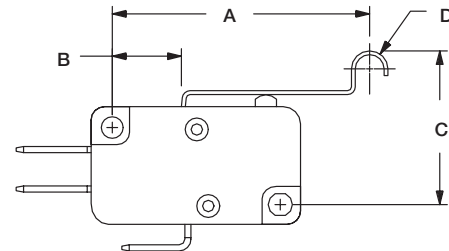
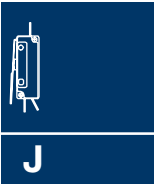
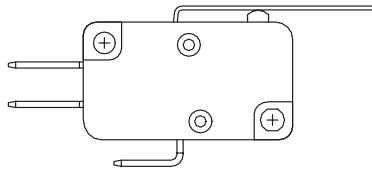


FIG. 4  
Simulated Roller



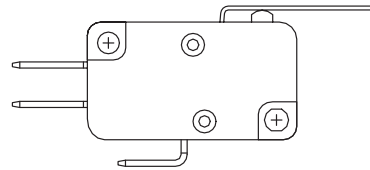
Snap-acting

### HIGH FORCE, LOW MOTION PIVOT POSITION



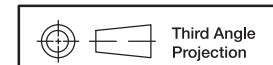
Available with actuators A10, A15, T10, T13, T14, T15, T16, T17 and T18.

### LOW FORCE, HIGH MOTION PIVOT POSITION



Available with actuators A20, A25, T20, T23, T24, T25, T26, T27 and T28.

**NOTE:** Lever actuator options are available in either of two pivot positions.  
Levers located in the forward pivot position have lower forces and higher motions.  
Levers located in the rear pivot position have higher forces and lower motions.



Third Angle  
Projection

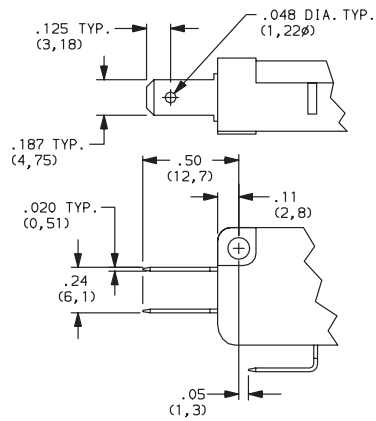
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



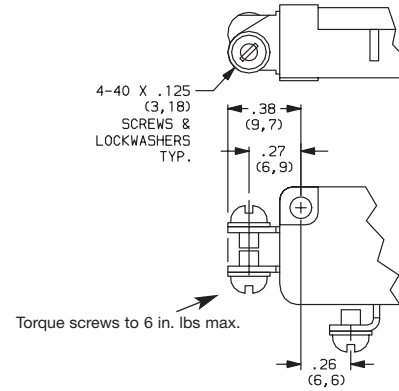
# TM Series Miniature Snap-acting Switches

## TERMINATIONS

### 40 .187" QUICK CONNECT

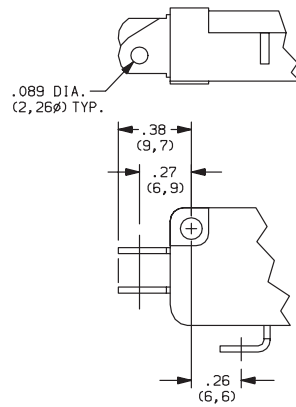


### 60 SCREW TERMINALS



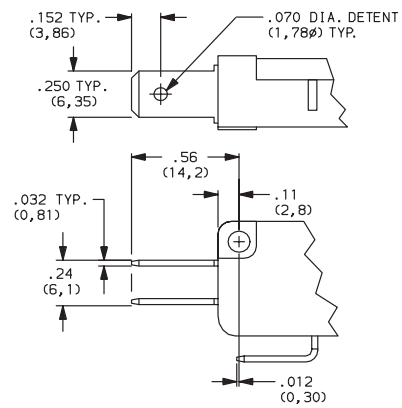
Not available with 'F5' rating option.

### 10 SOLDER



Not available with 'F5' rating option.

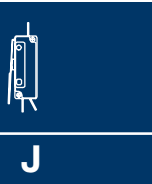
### 4A .250" QUICK CONNECT



Not available with 'F5' rating option.

## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)



Snap-acting



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# LC Series Subminiature Precision Snap-acting Switches



## Features/Benefits

- Compact design
- Long life and high electrical capacity
- Quick connect, wire lead or PC mounting
- Wide variety of actuator styles

## Typical Applications

- Motorized equipment
- Sump pump
- Thermostatic controls

UL61058-1  

## Specifications

CONTACT RATING: From low level\* to 10.1 AMPS @ 250 V AC.  
 ELECTRICAL LIFE: 100,000 cycles  
 INSULATION RESISTANCE: 1,000 M ohm min.  
 DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -17°F to 185°F (-25°C to 85°C).  
 OPERATING FORCE: From 142 to 170 grams at actuator button.  
 Forces are less at free end of lever actuators; (see OPERATING FORCE and ACTUATOR option sections).  
 MOUNTING: 2-56 screws, torque 2.3 in/lbs max.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service center.

## Materials

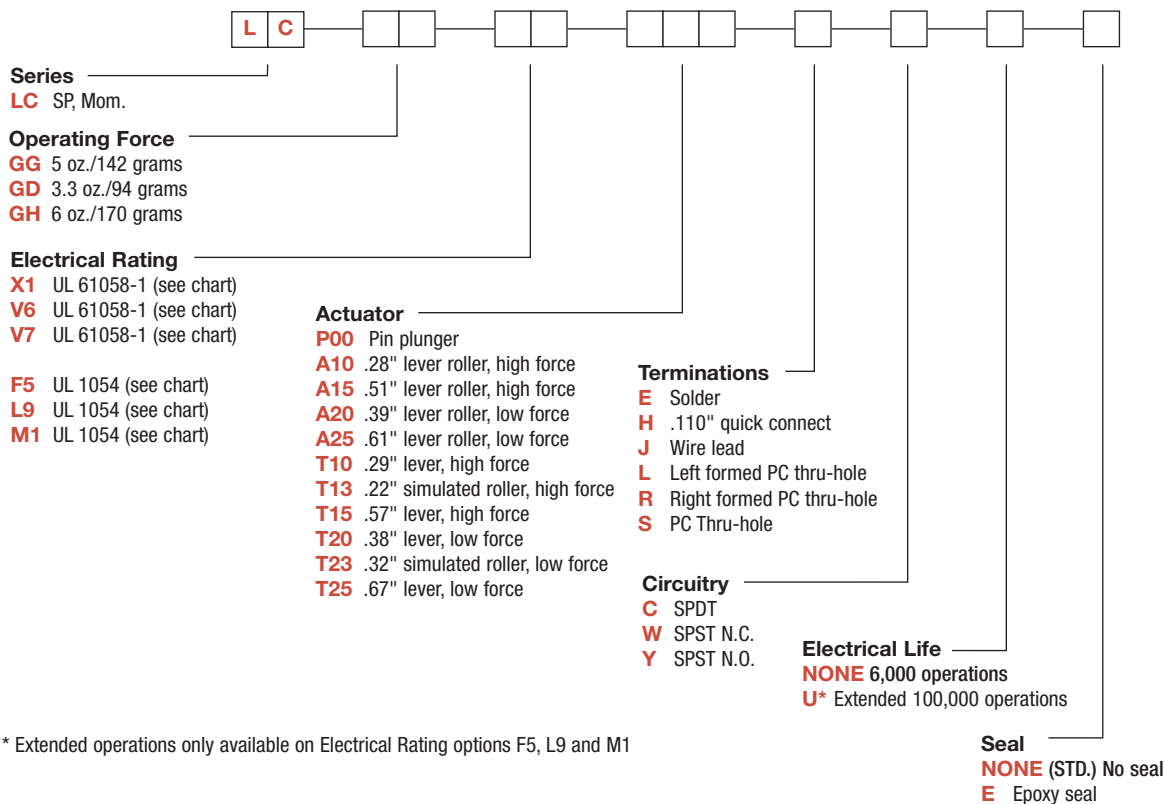
SWITCH HOUSING: Thermoplastic polyester or high temperature thermoplastic (PTS) (UL 94V-0).  
 ACTUATOR BUTTON: Thermoplastic polyester (UL 94V-0).  
 SPRING: Copper alloy.  
 PIVOT: Copper alloy.  
 MOVABLE CONTACTS: Fine silver for ratings greater than 1 AMP @ 125 V AC. Fine silver with 24K gold plate for 1 AMP @ 125 V AC or less.  
 STATIONARY CONTACTS: Fine silver welded on copper alloy for ratings greater than 1 AMP @ 125 V AC. Gold alloy welded on copper alloy for ratings less than 1 AMP @ 125 V AC.  
 TERMINALS: Copper alloy.  
 TERMINAL SEAL: Epoxy.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-33 through J-35. For additional options not shown in catalog, consult Customer Service Center.



\* Extended operations only available on Electrical Rating options F5, L9 and M1



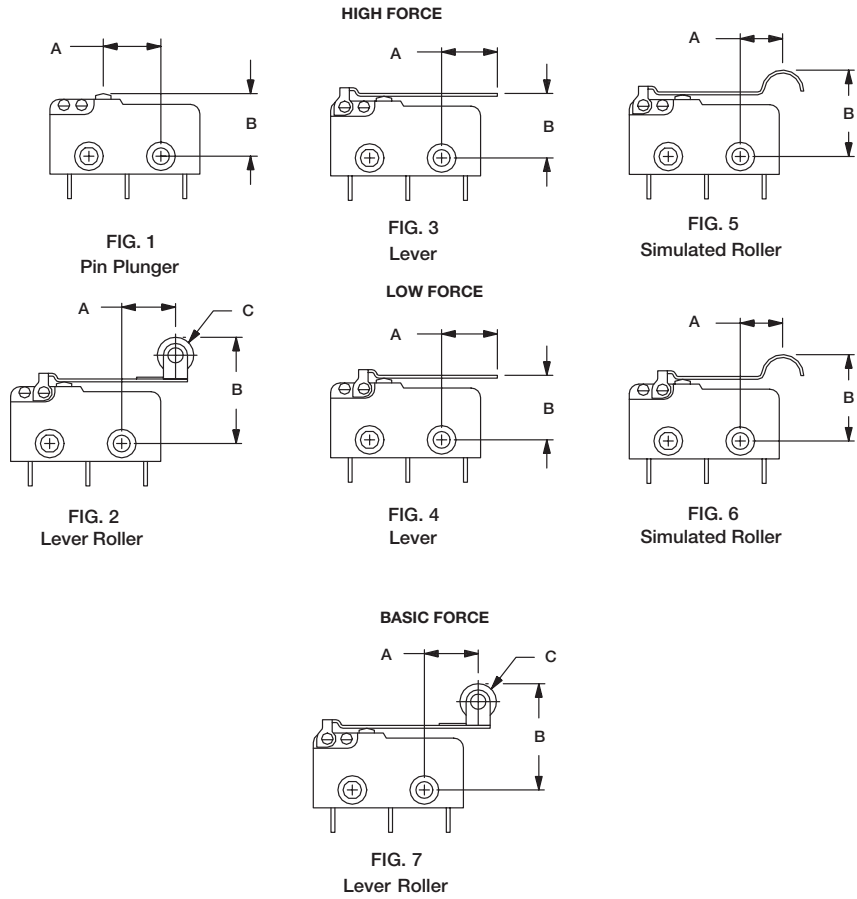
Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change



# LC Series Subminiature Precision Snap-acting Switches

ACTUATOR 

OPTION CODE	FIG.	DIM. A	DIM. B	DIM. C
P00	1	0.297 (7,6)	.330 ± .015 (8,38 ± 0,38)	—
A10	7	0.28 (7,1)	.570 ± .070 (14,48 ± 1,78)	.19 dia. (4,80)
A25	2	0.61 (15,5)	.570 ± .175 (14,22 ± 4,45)	.19 dia. (4,80)
T10	3	0.29 (7,4)	.340 ± .070 (8,64 ± 1,78)	—
T13	5	0.220 (5,3)	.455 ± .065 (11,56 ± 1,65)	—
T20	4	0.39 (9,9)	.340 ± .140 (8,64 ± 3,56)	—
T23	6	0.32 (8,1)	.455 ± .125 (11,56 ± 3,18)	—
T25	4	0.67 (17,0)	.340 ± .091 (8,64 ± 4,70)	—
A15	7	0.51 (13,0)	.560 ± .090 (14,22 ± 2,29)	.19 dia. (4,80)
A20	2	0.38 (9,7)	.560 ± .135 (14,22 ± 2,29)	.19 dia. (4,80)
T15	3	0.57 (14,51)	.340 ± .100 (8,64 ± 2,54)	—



## SWITCH CHARACTERISTICS

OPTION CODE	MAXIMUM OPERATING FORCE (OZ./GRAMS)			MINIMUM RELEASE FORCE (OZ./GRAMS)			MAXIMUM DIFFERENTIAL TRAVEL	MAXIMUM PRETRAVEL	MINIMUM OVERTRAVEL
	GG	GD	GH	GG	GD	GH	ALL FORCES	ALL FORCES	ALL FORCES
A10	1.69 48	1 28	2.0 57	.21 6	.11 3	.42 12	.034 (0,86)	.140 (3,56)	.029 (0,74)
A15	1.3 37	.68 19	1.6 44	.16 4.5	.07 2	.32 9	.044 (1,12)	.180 (4,57)	.037 (0,94)
A20	0.9 26	.52 15	1.1 31	.11 3	.05 15	.21 6	.067 (1,70)	.272 (6,91)	.053 (1,53)
A25	.70 20	.42 12	.85 24	.07 2	.04 1	.16 4.5	.086 (2,18)	.351 (8,92)	.068 (1,73)
P00	5 142	3.3 95	6 170	1 28	.05 14	2.0 57	.004 (0,10)	.030 (0,76)	.010 (0,25)
T10	1.7 48	1 28	2.1 60	.21 6	.10 3	.39 11	.035 (0,90)	.140 (3,56)	.029 (0,74)
T13	1.8 52	1.2 34	2.2 62	.21 6	.03 1	.42 12	.032 (0,81)	.130 (3,30)	.026 (0,66)
T20	0.9 26	.52 15	1.1 30	.10 3	.03 1	.21 6	.067 (1,70)	.276 (7,01)	.053 (1,35)
T23	1.0 28	.52 15	1.2 34	.10 3	.03 1	.21 6	.062 (1,57)	.252 (6,40)	.049 (1,24)
T25	0.7 19	.05 14	0.8 24	.07 2	.03 1	.14 4	.090 (2,29)	.372 (9,45)	.072 (1,83)
T15	1.2 35	1.3 39	1.5 42	0.14 4	.21 6	.28 81	.047 (1,19)	.190 (4,83)	.040 (1,02)

NOTE: For basic switch operating forces, see page J-32.



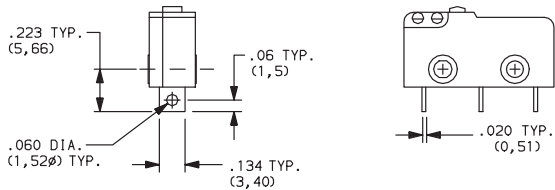
Third Angle Projection  
Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

**C&K**

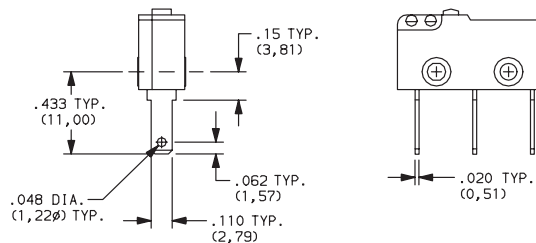
# LC Series Subminiature Precision Snap-acting Switches

## TERMINATIONS

**E** SOLDER

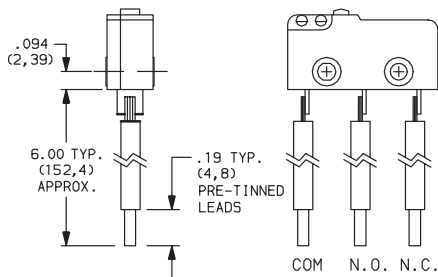


**H** .110" QUICK CONNECT



**NOTE:** Use Amp Quick Connect Part No. 640932-1.

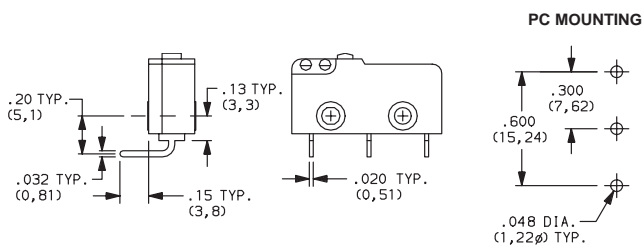
**J** WIRE LEAD



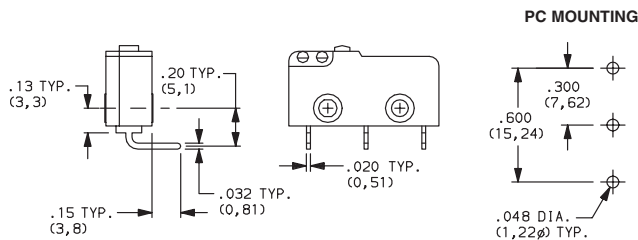
RATING	WIRE SIZE
1 AMP	22 AWG
5 AMPS	20 AWG
10.1 AMPS	18 AWG

TERMINAL	WIRE COLOR
COMMON	BLACK
NORMALLY OPEN	WHITE
NORMALLY CLOSED	RED

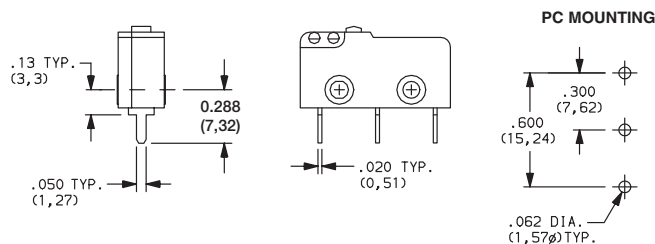
**L** LEFT FORMED PC THRU-HOLE



**R** RIGHT FORMED PC THRU-HOLE



**S** PC THRU-HOLE



## CIRCUITRY

**C** SPDT (Single Pole, Double Throw)

**W** SPST N.C. (Single Pole, Single Throw, Normally Closed)

**Y** SPST N.O. (Single Pole, Single Throw, Normally Open)

## ELECTRICAL LIFE

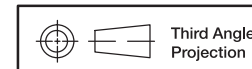
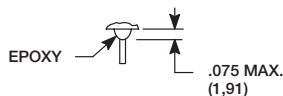
**NONE** 6,000 OPERATIONS

**U** EXTENDED 100,000 OPERATIONS

## SEAL

**NONE** NO SEAL

**E** EPOXY SEAL



Third Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

**C&K**

# LCA Series Subminiature Snap-acting Switches



## Features/Benefits

- Compact design
- Long life and high electrical capacity
- Quick connect, solder terminals, PC terminals
- Wide variety of actuator styles
- RoHS compatible

## Typical Applications

- Motorized equipment
- Sump pump
- Thermostatic controls

UL61058-1  

## Specifications

CONTACT RATING: From low level to 10.1 AMPS @ 125/250 V AC  
 ELECTRICAL LIFE: see chart below  
 MECHANICAL LIFE: 300,000 cycles.  
 INSULATION RESISTANCE: 100 M ohm min.  
 DIELECTRIC STRENGTH: 1,500 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -40°C to +125°C  
 OPERATING FORCE: 150 grams at actuator button MAX.  
 Forces are less at free end of lever actuators; (see ACTUATOR'S option sections).  
 MOUNTING: 2-56 screws, torque 2.3 in/lbs max.

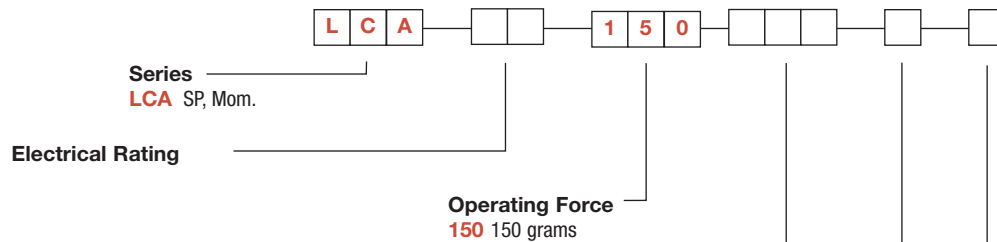
## Materials

SWITCH HOUSING: Thermoplastic polyester  
 ACTUATOR BUTTON: Thermoplastic polyester.  
 SPRING: Copper alloy.  
 PIVOT: Copper alloy.  
 MOVABLE CONTACTS: Silver alloy  
 STATIONARY CONTACTS: Silver alloy  
 TERMINALS: Copper alloy.  
 ACTUATOR LEVER: Stainless steel.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-36 thru J-39. For additional options not shown in catalog, consult Customer Service Center.



Option Code	UL 1054	UL 61058-1	RoHS
01	0.1 A 125/250 V AC 1E4	0.1 A 125/250 V AC 1E4	0.1 A 125/250 V AC 1E4
06	6 A 125/250 V AC 1E4	6 A 125/250 V AC 1E4	6 (2)A 125/250 V AC 1E4
10	10.1 A 125/250 V AC 1E4	10.1 A 125/250 V AC 1E4	10.1 A 125/250 V AC 1E4
S5	NA	5 A 125/250 V AC 1E5	NA

## Actuator

- P00 Pin plunger
- T05 4.8 mm short lever
- T06 6.8 mm lever
- T09 8.8 mm lever
- T12 12.9 mm lever
- T16 15.2 mm lever
- T18 18.1 mm lever
- T21 20.1 mm lever
- T23 23.4 mm lever
- T43 43.5 mm lever
- S06 6.0 mm simulated lever
- S09 9.2 mm simulated lever
- A05 5.0 mm lever roller

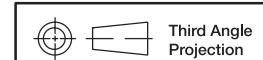
## Terminations

- S Solder
- Q .110 Quick Connect
- P PC Thru Hole
- L Left Form PC
- R Right Form PC

## Circuitry

- C SPDT
- W SPST N.C.
- Y SPST N.O.

Snap-acting



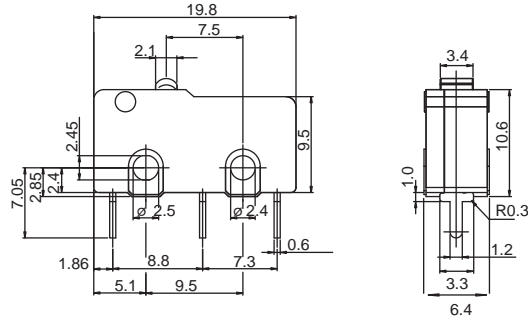
Dimensions are shown: mm  
 Specifications and dimensions subject to change



# LCA Series Subminiature Snap-acting Switches

SERIES 

LCA



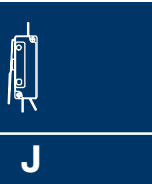
ELECTRICAL RATING 

RoHS COMPLIANT *	RoHS COMPATIBLE *	OPTION CODE	ELECTRICAL RATING
YES	YES	<b>01</b>	0.1A, 125/250 VAC
YES	YES	<b>06</b>	6A, 125/250 VAC
YES	YES	<b>10</b>	10.1A, 125/250 VAC
YES	YES	<b>S5</b>	5A, 125/250 VAC

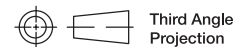
\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

OPERATING FORCE 

OPTION CODE	OPERATING FORCES (grams)
<b>150</b>	150 grams max.



Snap-acting



Third Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

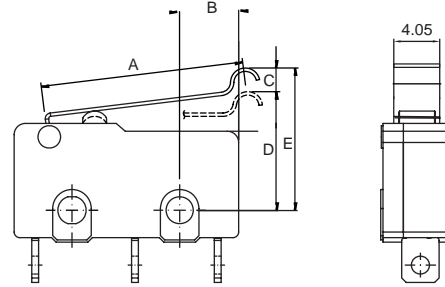
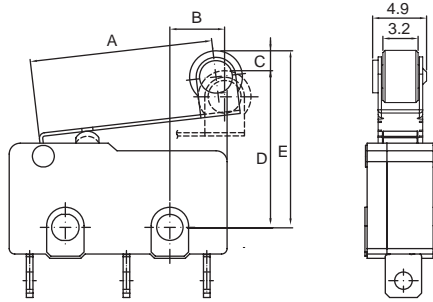
www.ck-components.com

# LCA Series Subminiature Snap-acting Switches

## ACTUATOR

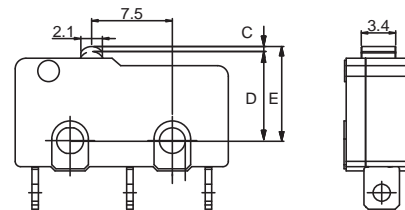
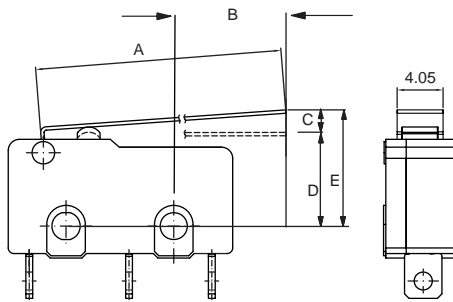
**A05** LEVER ROLLER

**SXX** SIMULATED ROLLER



**TXX** LEVER

**P00**



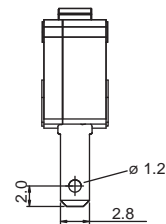
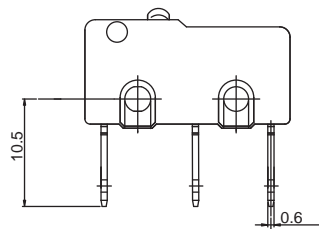
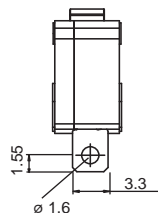
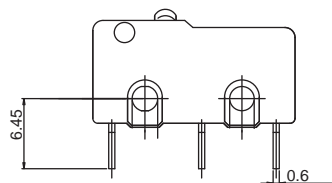
ACTUATOR OPTION CODE	A mm	B mm	eC mm	D mm	E mm	Diff. Motion mm max	Oper. Force max. grams	Release Force min. grams	Over Travel min.
	LENGTH OF LEVER	Lever length for front mtg. hole to OP	PRE TRAVEL (MAX)	OPERATING POSITION	FREE POSITION (MAX)				
P00	NA	NA	1.10	8.55 ± 0.3	9.35	0.20	150	25	0.4
T05	16.70	4.80	3.60	8.95 ± 0.8	11.75	0.80	50	6	0.6
T06	18.70	6.80	4.03	8.9 ± 0.9	12.09	0.90	45	5	0.67
T09	20.60	9.10	5.64	9.15 ± 1.35	13.45	1.83	33	2	0.75
T12	24.80	12.90	3.35	8.95 ± 1.5	13.10	1.19	34	2	0.89
T16	27.10	15.20	7.20	9.15 ± 1.7	15.15	1.30	40	1	0.70
T18	30.00	18.10	7.70	8.95 ± 1.9	14.65	1.50	32	1	1.2
T21	32.00	20.10	8.00	8.15 ± 1.85	15.55	1.60	35	1	1.0
T23	35.20	23.40	8.60	8.95 ± 2.0	15.55	1.80	25	1	1.5
T43	55.20	43.50	10.45	8.95 ± 3.0	19.25	2.90	15	1	1.0
S06	17.90	6.00	3.86	10.85 ± 0.9	17.81	0.86	47	5	0.64
S09	21.10	9.20	5.7	16.15 ± 1.5	20.35	1.00	42	2	1.0
A05	16.60	5.00	3.8	14.65 ± 0.8	17.65	0.80	50	6	0.6

# LCA Series Subminiature Snap-acting Switches

## TERMINATIONS

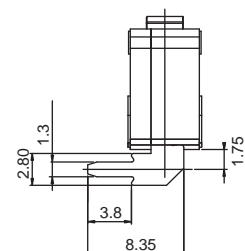
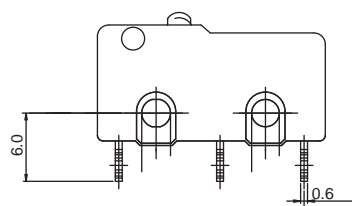
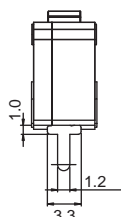
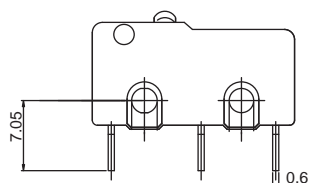
**S** SOLDER

**Q** QUICK CONNECT

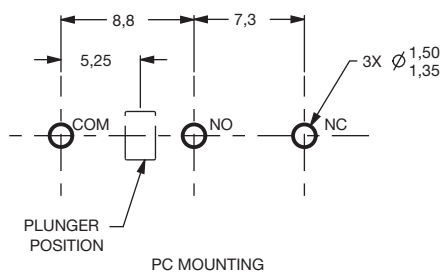
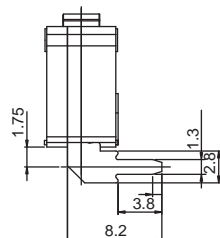
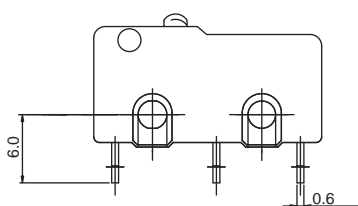


**P** PC THRU HOLE

**L** LEFT FORM PC



**R** RIGHT FORM PC



Snap-acting

## CIRCUITRY

**C** SPDT (Single Pole, Double Throw)

**W** SPST N.C. (Single Pole, Single Throw, Normally Closed)

**Y** SPST N.O. (Single Pole, Single Throw, Normally Open)



Third Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

**C&K**

# LCS Series Subminiature Sealed Snap-acting Switches



UL61058-1  

## Features/Benefits

- Compact design
- Long life and high electrical capacity
- Quick connect, solder terminals, PC terminals, wire leads
- Wide variety of actuator styles
- RoHS compatible, RoHS compliant
- IP67

## Typical Applications

- Motorized equipment
- Sump pump
- Thermostatic controls
- Computers
- Air conditioners

## Specifications

CONTACT RATING: from low level to 5 Amp

ELECTRICAL LIFE: 10,000 cycles

INSULATION RESISTANCE: 100 M ohm min.

DIELECTRIC STRENGTH: 1,000 VAC

OPERATING TEMPERATURE:

-40°C to +120°C (without wire)

-40°C to +85°C (with UL1007 wire)

-40°C to +105°C (with UL1015 wire)

-40°C to +105°C (with UL1430 wire)

-40°C to +80°C (with UL1061 wire)

-40°C to +120°C (with UL1330 wire)

OPERATING FORCE: (see ACTUATOR'S option sections).

MOUNTING: 2-56 screws, torque 2.3 in/lbs max.

**NOTE:** Specifications and materials listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service center.

## Materials

SWITCH HOUSING: Thermoplastic polyester or high temperature thermoplastic (PTS) (UL 94V-0).

ACTUATOR BUTTON: Thermoplastic polyester.

SPRING: Copper alloy.

PIVOT: Copper alloy.

MOVABLE CONTACTS: Option "01" Gold plating over silver alloy  
Option "05" Silver alloy

STATIONARY CONTACTS: Option "01" Gold plating over silver alloy  
Option "05" Silver alloy


TERMINALS: Copper alloy.

ACTUATOR LEVEL: Stainless steel.

Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-40 thru J-43. For additional options not shown in catalog, consult Customer Service Center.

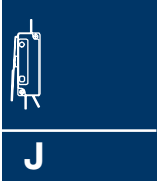
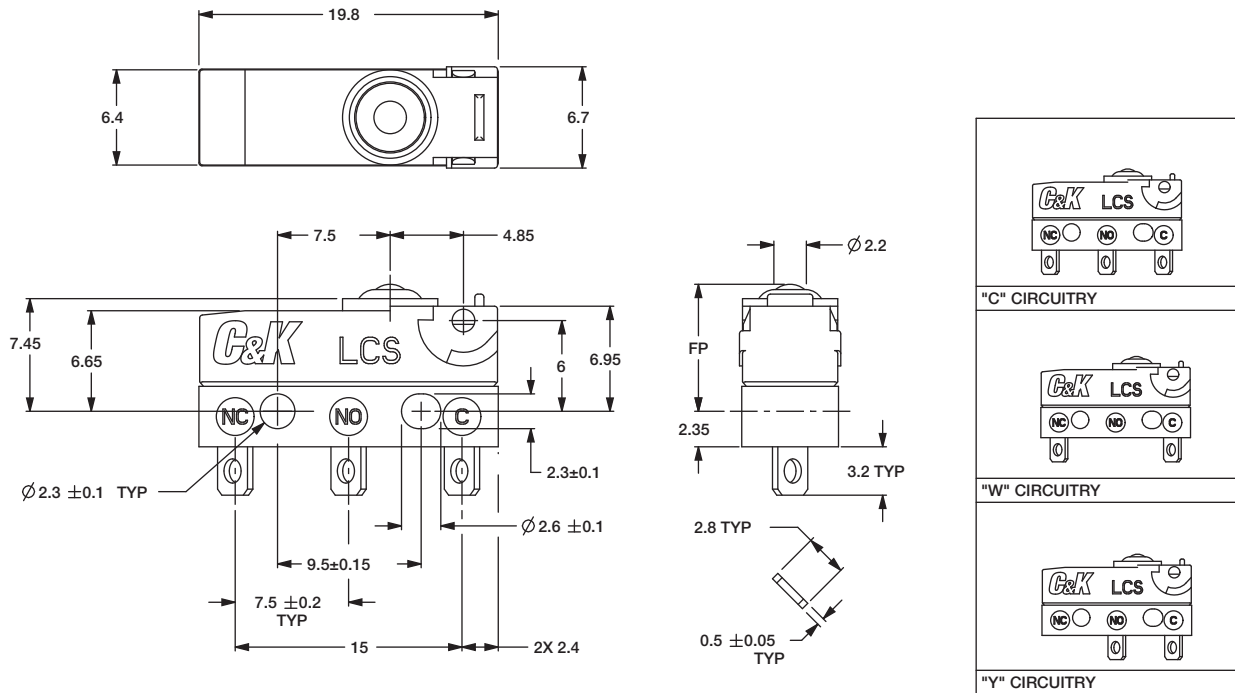
Series <b>LCS</b>			Electrical Rating		Operating Force <b>2</b> 203 grams		Actuator		Terminations		Wire Type AWG		Wire UL # (when required)		Circuitry	
Option Code		UL 61058-1														
<b>01</b>		0.1 A 125/250 V AC														
<b>05</b>		5 A 125/250 V AC	6 A 250 V AC													
							<b>P00</b> Pin plunger <b>T00</b> 11.9 mm short lever <b>T05</b> 17.4 mm short lever <b>T07</b> 19.4 mm short lever <b>T13</b> 25.5 mm lever <b>T19</b> 33.3 mm lever <b>T28</b> 40.7 mm lever <b>T43</b> 55.9 mm lever <b>S26</b> 18.6 mm simulated lever <b>A05</b> 17.2 mm lever roller		<b>S</b> Solder <b>Q</b> 0.110 Quick Connect <b>P</b> PC Thru Hole <b>W</b> Wire leads potted <b>Z</b> Wire leads non-potted		<b>20</b> 20 AWG <b>22</b> 22 AWG <b>24</b> 24 AWG <b>26</b> 26 AWG		<b>A</b> UL1007 <b>B</b> UL1015 <b>C</b> UL1430 <b>D</b> UL1061		<b>C</b> SPDT <b>W</b> SPST N.C. <b>Y</b> SPST N.O.	
											<b>Wire Side (when required)</b> <b>A</b> Wire out the bottom <b>B</b> Wire out the right side <b>C</b> Wire out the left side <b>D</b> None					



# LCS Series Subminiature Sealed Snap-acting Switches

## SERIES

**LCS**



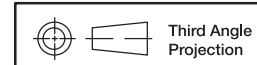
**Snap-acting**

## ELECTRICAL RATING

RoHS COMPLIANT *	RoHS COMPATIBLE *	OPTION CODE	ELECTRICAL RATING
YES	YES	<b>05</b>	5 AMP, 125/250 V AC
YES	YES	<b>01</b>	0.1 AMP, 125/250 V AC

## OPERATING FORCE

OPTION CODE	OPERATING FORCES (grams)
<b>2</b>	203 g. max.

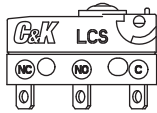


*Dimensions are shown: mm  
Specifications and dimensions subject to change*

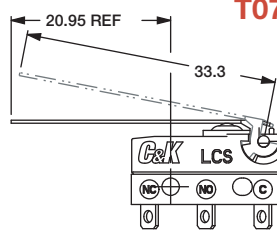
# LCS Series Subminiature Sealed Snap-acting Switches

ACTUATOR

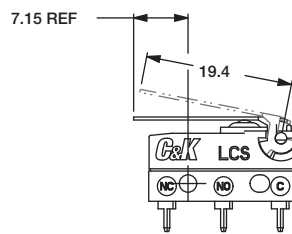
**P00**



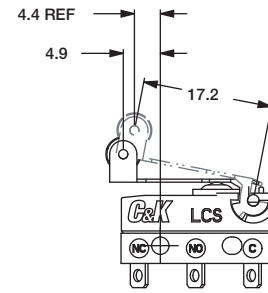
**T19**



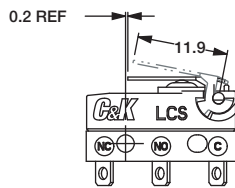
**T07**



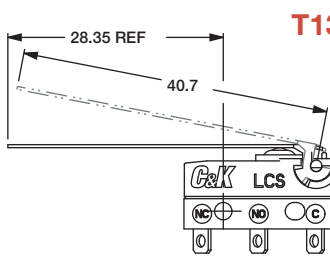
**A05**



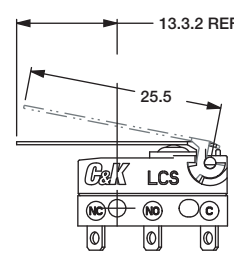
**T00**



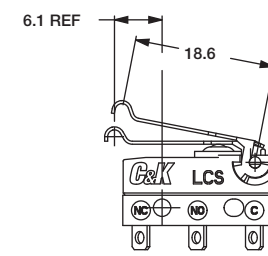
**T28**



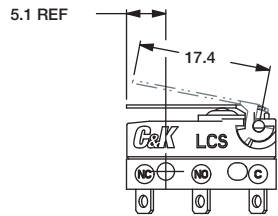
**T13**



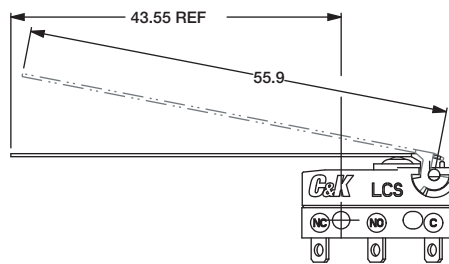
**S26**



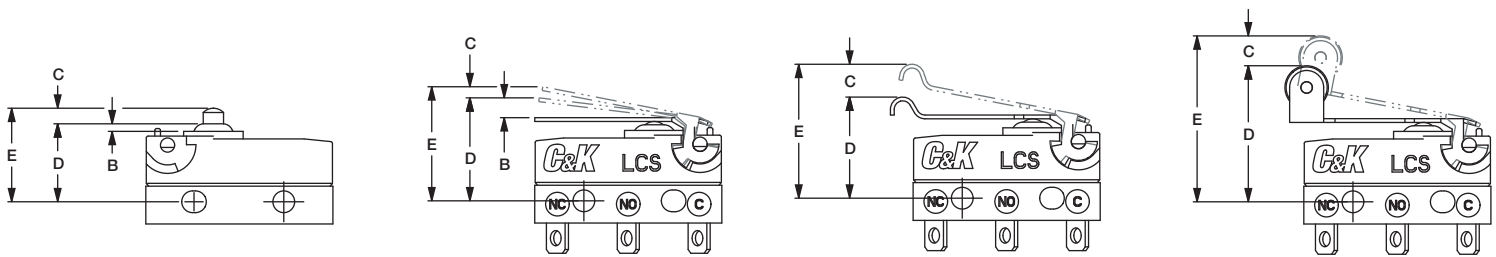
**T05**



**T43**



Snap-acting



ACTUATOR OPTION CODE	A	B	C	D	E	DIFFERENTIAL MOTION (MAX)	OPERATING FORCE (MAX)	RELEASE FORCE (MIN)
	LENGTH OF LEVER	OVER TRAVEL (MIN)	PRE TRAVEL (MAX)	OPERATING POSITION	FREE POSITION (MAX)	203	203	203
P00	N/A	0.6	1.2	8.4 ± 0.3	9.9	0.2	203	50
T00	11.9	0.6	3.2	8.8 ± 0.9	11.1	0.5	98	21
T05	17.40	0.9	4.3	8.8 ± 1.1	12	0.6	82	16
T07	19.40	1	4.8	8.8 ± 1.2	12.4	0.7	66	13
T13	25.5	1.6	6.3	8.8 ± 1.6	13.5	0.9	54	11
T19	33.3	1.95	8	8.8 ± 2.0	15	1.75	40	5
T28	40.7	2.1	10.1	8.8 ± 2.6	16.3	2.3	39	8
T43	55.9	2.9	13.8	8.8 ± 3.5	19.1	3.6	33	7
S26	18.6	1	4.6	10.7 ± 1.2	14.1	0.65	68	14
A05	17.20	0.9	4.3	14.5 ± 1.1	17.7	0.6	72	15



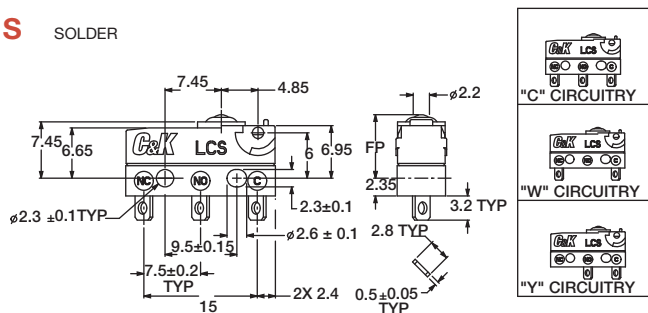
Third Angle  
Projection  
Dimensions are shown: mm  
Specifications and dimensions subject to change



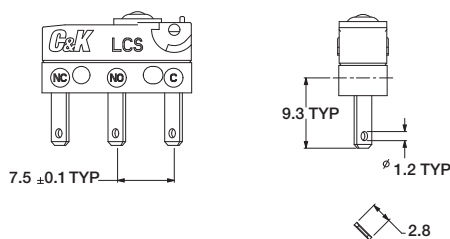
# LCS Series Subminiature Sealed Snap-acting Switches

## TERMINATIONS

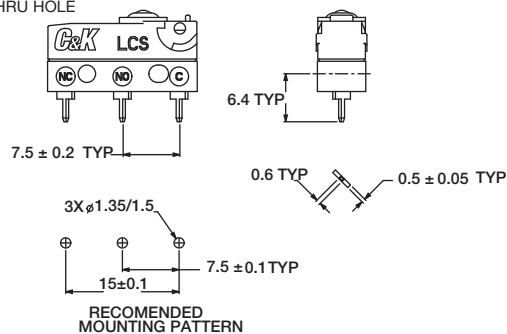
**S** SOLDER



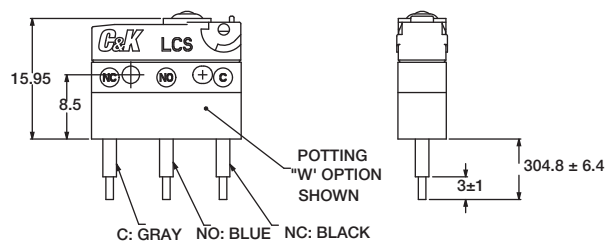
**Q** QUICK CONNECT 2.8mm / 0.110"



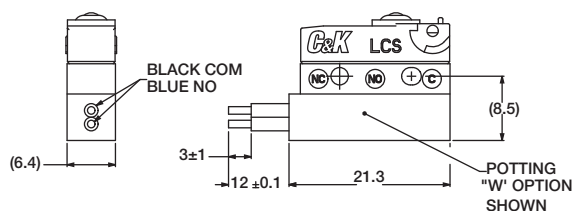
**P** PC THRU HOLE



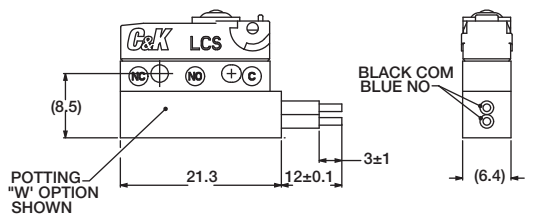
**Z or W** "A" WIRE ORIENTATION



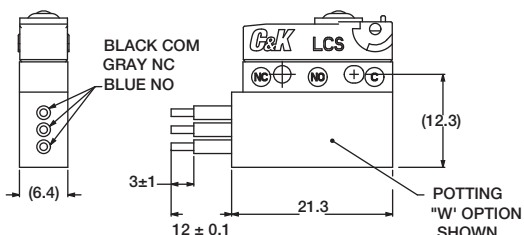
**Z or W** "B" WIRE ORIENTATION  
"Y" OR "W" CIRCUITRY



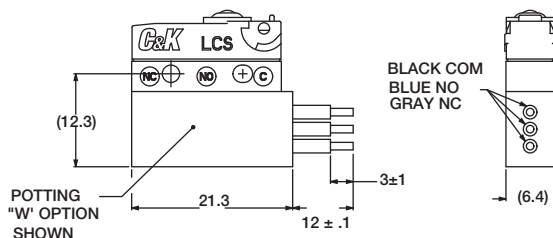
**Z or W** "C" WIRE ORIENTATION  
"Y" OR "W" CIRCUITRY



**Z or W** "B" WIRE ORIENTATION  
"C" CIRCUITRY



**Z or W** "C" WIRE ORIENTATION  
"C" CIRCUITRY



## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)



Third Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change



Snap-acting

# MM Series Subminiature Precision Snap-acting Switches



## Features/Benefits

- Low level and power switching
- Long electrical and mechanical life
- Increased overtravel
- Reliable snap-acting mechanism

## Typical Applications

- Limited space constraints
- Communication devices

## Specifications

CONTACT RATING: From low level\* to 7 AMPS @ 250 V AC.  
 ELECTRICAL LIFE: 100,000 cycles at full rated load.  
 INSULATION RESISTANCE: 1,000 ohm min.  
 DIELECTRIC STRENGTH: 1,000 V RMS min. @ sea level.  
 OPERATING TEMPERATURE: -67 F to 275 F (-55 C to 135 C).  
 OPERATING FORCE: 5 oz. (142 grams) max. at actuator button.  
 MOUNTING: 2-56 screws, torque 2 in/lbs max.

\*Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service center.

## Materials

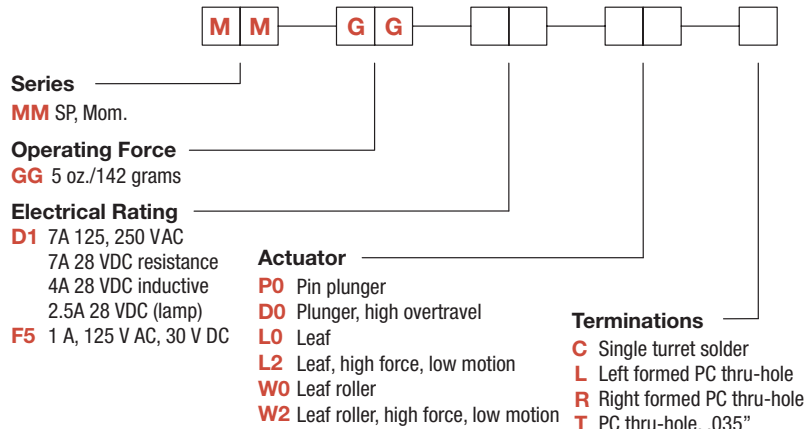
SWITCH HOUSING: Heat resistant phenolic (UL 94V-0).  
 ACTUATOR BUTTON: Heat resistant phenolic (UL 94V-0).  
 SPRING: Beryllium copper CDA alloy C17200.  
 PIVOT: Brass CDA alloy 260.  
 MOVABLE CONTACTS: Fine silver for ratings greater than 1 AMP @ 125 V AC. 24K gold for 1 AMP @ 125 V AC or less.  
 STATIONARY CONTACTS: Fine silver inlay on copper CDA alloy C10200 for ratings greater than 1 AMP @ 125 V AC. 24K gold on copper CDA alloy C10200 for 1 AMP @ 125 V AC or less.  
 TERMINALS: Copper CDA alloy C18700.



## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-44 through J-49. For additional options not shown in catalog, consult Customer Service Center.

Snap-acting



Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

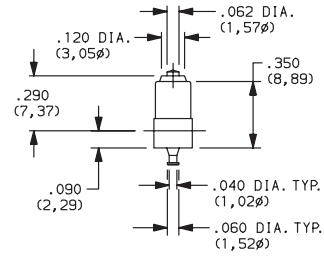
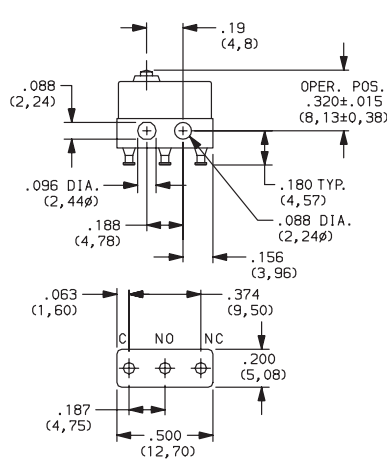


# MM Series Subminiature Precision Snap-acting Switches

## SWITCH WITH STANDARD OPTIONS



MMGGD1P0C



PART NUMBER	BASIC OPERATING FORCE (OZ./GRAMS)	ELECTRICAL RATING
MMGGD1P0C	5 142	7 AMPS @ 250 V AC.

### SERIES ■ ■ ■ ■ ■ ■ ■ ■

**MM** SPDT MOMENTARY

### OPERATING FORCE ■ ■ ■ ■ ■ ■ ■ ■

OPTION CODE	BASIC SWITCH OPERATING FORCE
GG	5 oz. (142 grams) maximum for basic switch with pin plunger actuator ('PO' actuator option).

NOTE: Operating force varies with actuator option, see ACTUATOR option section.

### ELECTRICAL RATING ■ ■ ■ ■ ■ ■ ■ ■

OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL		ELECTRICAL RATING
			MOVABLE CONTACT	STATIONARY CONTACT	
D1	Yes	Yes	Fine silver.	Fine silver inlay on copper alloy.	7A 125, 250 VAC; 7A 28 VDC resistance 4A 28 VDC inductive; 2.5A 28 VDC (lamp)
F5	Yes	Yes	24K Gold.	24K Gold on copper alloy.	From low level* to 1 AMP @ 125 V AC, 30 V DC.

Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

All models with all options.

Consult Customer Service Center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

### ACTUATOR ■ ■ ■ ■ ■ ■ ■ ■

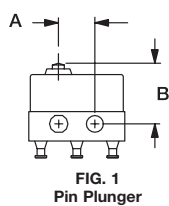


FIG. 1  
Pin Plunger

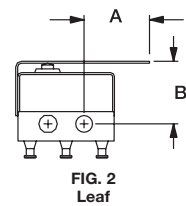


FIG. 2  
Leaf

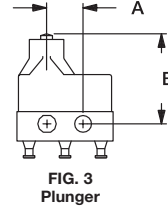


FIG. 3  
Plunger

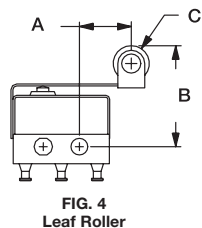


FIG. 4  
Leaf Roller

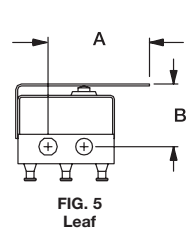


FIG. 5  
Leaf

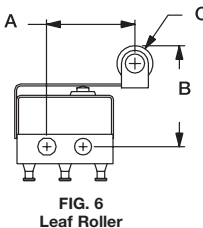


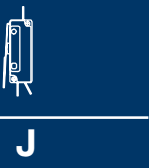
FIG. 6  
Leaf Roller

OPTION CODE	FIG.	DIM. A	DIM. B	DIM. C
P0	1	.19 (4,8)	.320 ± .015 (8,13 ± 0,38)	—
D0	3	.19 (4,8)	.475 ± .031 (12,07 ± 0,79)	—
L0	2	.34 (8,6)	.330 ± .015 (8,38 ± 0,38)	—
L2	5	.53 (13,5)	.330 ± .015 (8,38 ± 0,38)	—
W0	4	.27 (6,9)	.532 ± .025 (13,51 ± 0,64)	.188 dia. (4,780)
W2	6	.46 (11,7)	.532 ± .025 (13,51 ± 0,64)	.188 dia. (4,780)



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



Snap-acting

# MM Series Subminiature Precision Snap-acting Switches

## ACTUATOR

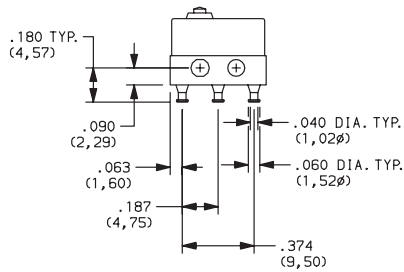
### SWITCH CHARACTERISTICS

OPTION CODE	MAXIMUM OPERATING FORCE (OZ./GRAMS)	MINIMUM RELEASE FORCE (OZ./GRAMS)	MAXIMUM DIFFERENTIAL TRAVEL	MAXIMUM PRETRAVEL	MINIMUM OVERTRAVEL
D0	5 142	.7 20	.004 (0,10)	.030 (0,76)	.040 (1,02)
L0	4 115	.7 20	.025 (0,64)	.090 (2,29)	.045 (1,14)
L2	6 170	.7 20	.012 (0,30)	.075 (1,90)	.015 (0,38)
P0	5 142	1 28	.002 (0,05)	.020 (0,51)	.004 (0,10)
W0	4 115	.7 20	.025 (0,64)	.090 (2,29)	.045 (1,14)
W2	6 170	.7 20	.012 (0,30)	.075 (1,90)	.015 (0,38)

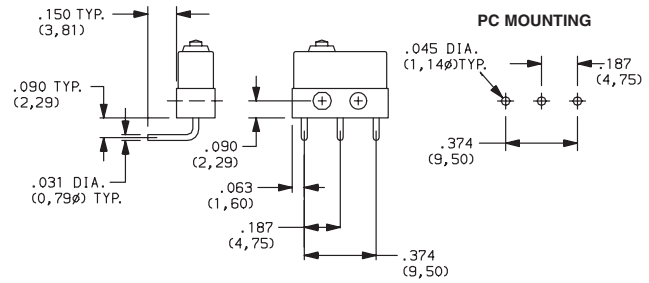
NOTE: For basic switch operating forces, see page J-44

## TERMINATIONS

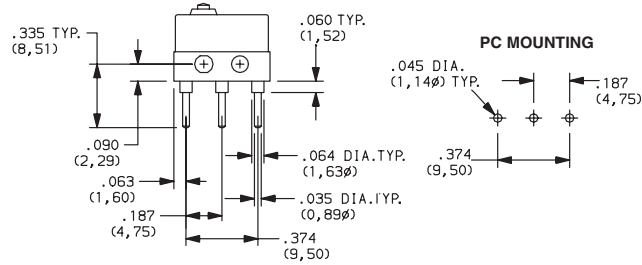
### C SINGLE TURRET SOLDER



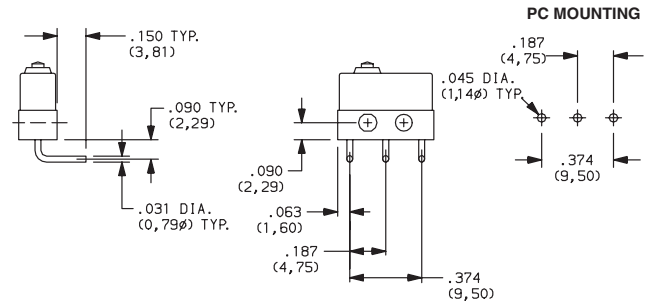
### L LEFT FORMED PC THRU-HOLE



### T PC THRU-HOLE, .035"



### R RIGHT FORMED PC THRU-HOLE



Snap-acting



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

# ZM Series Subminiature Snap-acting Switches

## Features/Benefits

- **Reliable snap-acting mechanism**
- **Long electrical and mechanical life**
- **Compact size—Ideal when space is limited**
- **Various PCB terminals and actuators**
- **RoHS compliant / compatible**

## Typical Applications

- **PCB detection switch**
- **Communication devices**
- **Testing equipment**
- **Security/Alarm systems**
- **Consumer electronics**



UL61058-1  

## Specifications

CONTACT RATING: F7: 3A @ 125 VAC  
M9: 0.2A @ 60 VDC.  
ELECTRICAL LIFE: 10,000 Cycles. @ 3A  
INSULATION RESISTANCE: 100 M ohm min.  
DIELECTRIC STRENGTH: 1000 Vrms.  
OPERATING TEMPERATURE: -30°C to 85°C.  
OPERATING FORCE: CJ: 150 grams, CH: 90 grams.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

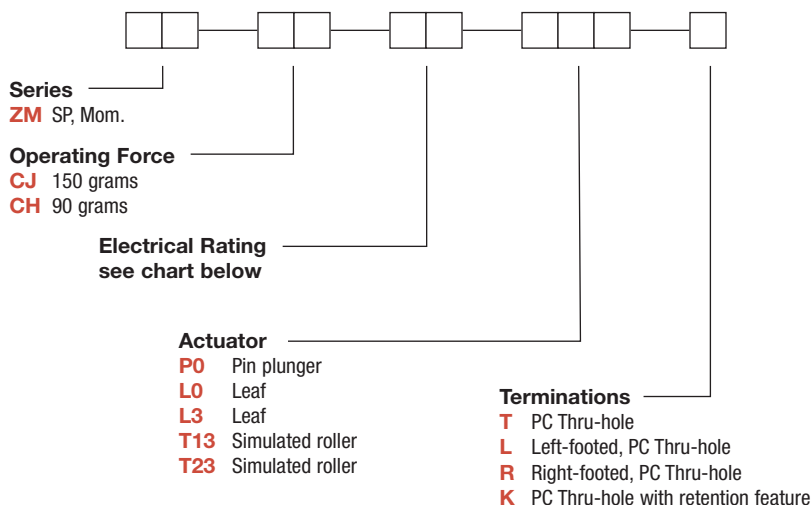
## Materials




COVER: Nylon 6/6  
ACTUATOR BUTTON: Nylon 6/6  
CASE: Nylon 6/6  
SPRING: SUS  
MOVABLE BLADE: BeCu  
MOVABLE CONTACT: Silver alloy (M9 option gold plated)  
FIXED CONTACTS: Silver alloy (M9 option gold plated)  
FIXED TERMINALS: Brass - Ag plated.  
ACTUATOR (Leaf / Roller options): SUS

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

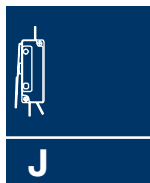
To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-48 and J-49. For additional options not shown in catalog, consult Customer Service Center.



Option Code	 1054	 61058-1	
<b>F7</b>	3 A 125 V AC	3 A 125 V AC 3 A 30 V DC	3 A 125 V AC
<b>M9</b>	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

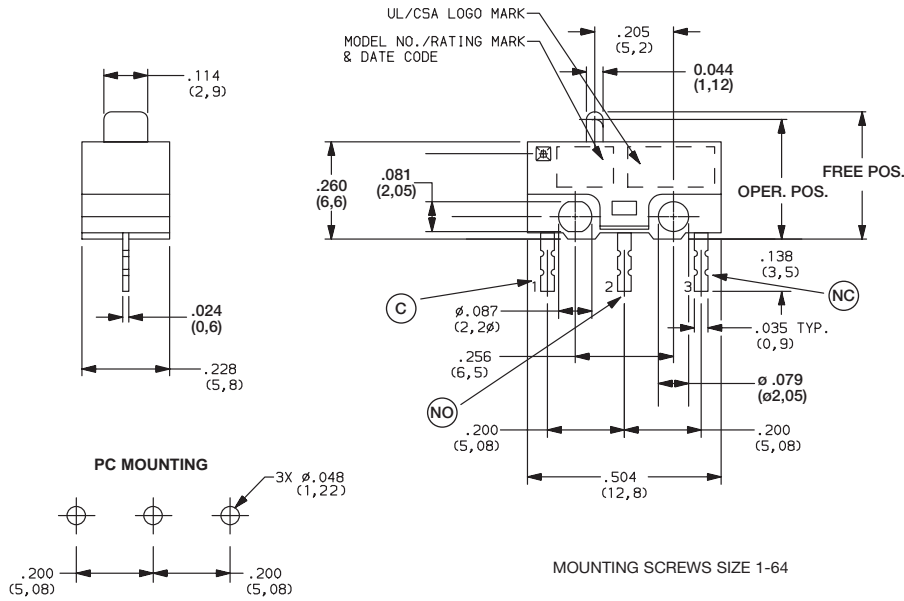


Snap-acting

# ZM Series Subminiature Snap-acting Switches

SERIES **ZM** ■ ■ ■ ■ ■ ■ ■ ■

**ZM** SUBMINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY



ZMCJF7L0T  
SPDT

## OPERATING FORCE ■ ■ ■ ■ ■ ■ ■ ■

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
<b>CJ</b>	5.29 150
<b>CH</b>	3.15 90

## ELECTRICAL RATING ■ ■ ■ ■ ■ ■ ■ ■

OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL		ELECTRICAL RATING
			MOVABLE CONTACT	STATIONARY CONTACT	
<b>F7</b>	Yes	Yes	Silver alloy		see chart
<b>M9</b>	Yes	Yes	Gold plating or silver alloy		see chart

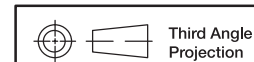
\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

All models **cULus** with all options.

Consult Customer Service center for availability and delivery of nonstandard ratings.

Option Code	<b>cULus</b> 1054	<b>cULus</b> 61058-1	
<b>F7</b>	3 A 125 V AC	3 A 125 V AC 3 A 30 V DC	3 A 125 V AC
<b>M9</b>	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC	0.1 A 48 V DC 0.2 A 60 V DC 0.1 A 125 V AC

Snap-acting

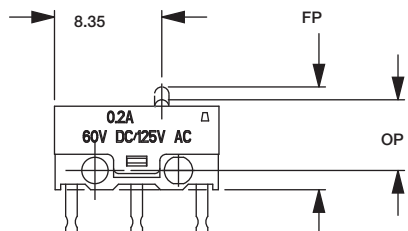


Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

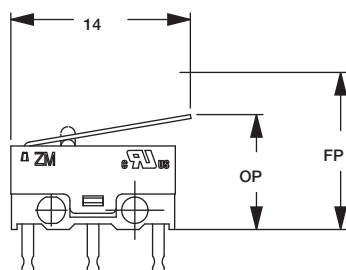
# ZM Series Subminiature Snap-acting Switches

## ACTUATOR

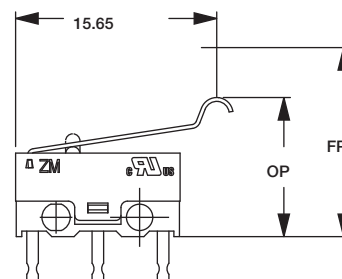
**P0** PIN PLUNGER



**L0** LEAF, 50 GRAMS (CJ ONLY)  
**L3** LEAF, 30 GRAMS (CH ONLY)



**T13** SIMULATED ROLLER, 40 GRAMS (CJ ONLY)  
**T23** SIMULATED ROLLER, 25 GRAMS (CH ONLY)



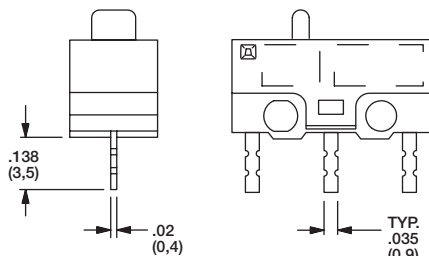
ACTUATOR OPTION CODE	A (mm)	B Ref (mm)	C (mm)	D (mm)	E (mm)	DIFF. MOTION mm MAX	OPER. FORCE grams MAX		RELEASED FORCE Grams MAX	OVER TRAVEL MIN
	LENGTH OF LEVER	LEVER LENGTH MTG. HOLE TO OP	PRE- TRAVEL MAX	OPERATING POSITION	FREE POSITION MAX		CJ	CH		
P0 PIN PLUNGER	NA	NA	1.3	7.0 ±0.3	8.0	0.3	150	90	15-20	0.2
L0 LEAF	13.0	4.03	3.4	8.4 ±0.8	11.0	1.3	50	-	8	0.6
L3 LEAF	13.0	4.03	3.4	8.4 ±0.8	11.0	1.3	-	30	5	0.6
T13 SIMULATED ROLLER	15.0	5.36	3.8	10.5 ±0.8	13.0	1.5	40	-	7	0.6
T23 SIMULATED ROLLER	15.0	5.36	3.8	10.5 ±0.8	13.0	1.5	-	25	4	0.6



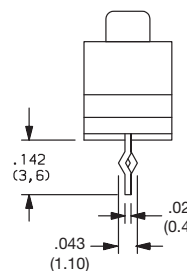
Snap-acting

## TERMINATIONS

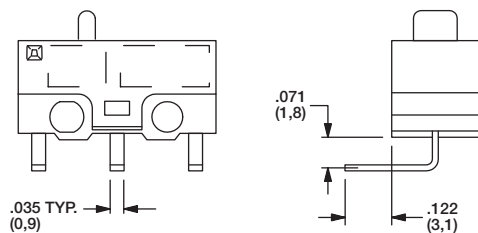
**T** (STD.) PC THRU-HOLE



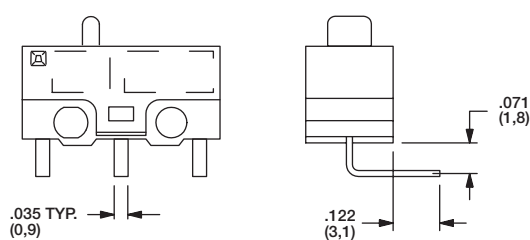
**K** PC THRU-HOLE WITH RETENTION FEATURE



**L** LEFT FOOTED, PC THRU-HOLE



**R** RIGHT FOOTED, PC THRU-HOLE

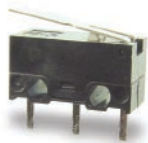


Third Angle  
Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**

# ZMA Series Subminiature Snap-acting Switches



## Features/Benefits

- **Reliable snap-acting mechanism**
- **Long electrical and mechanical life**
- **Compact size—Ideal when space is limited**
- **Various PCB terminals and actuators**
- **RoHS compatible & compliant**

## Typical Applications

- **PCB detection switch**
- **Communication devices**
- **Testing equipment**
- **Security/Alarm systems**
- **Consumer electronics**

UL61058-1



## Specifications

CONTACT RATING: 3A @ 125 V AC 24 V DC  
 1 A @125 / 250 V AC 24 V DC  
 0.1A @ 125 V AC 60 V DC

ELECTRICAL LIFE: 300,000 cycles @ 0.1A / 10,000 cycles @ 3A.  
 MECHANICAL LIFE: 1,000,000 cycles.  
 INSULATION RESISTANCE: 100 M ohm min.  
 DIELECTRIC STRENGTH: 500 Vrms.  
 OPERATING TEMPERATURE: -40°C to 85°C  
 OPERATING FORCE: 80 or 150 grams.

## Materials

CASE/COVER: PBT  
 ACTUATOR: Button nylon 6/6  
 MOVABLE CONTACTS: Silver alloy or gold plated  
 STATIONARY CONTACTS: Silver alloy or gold plated  
 TERMINALS: Brass, silver plated.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

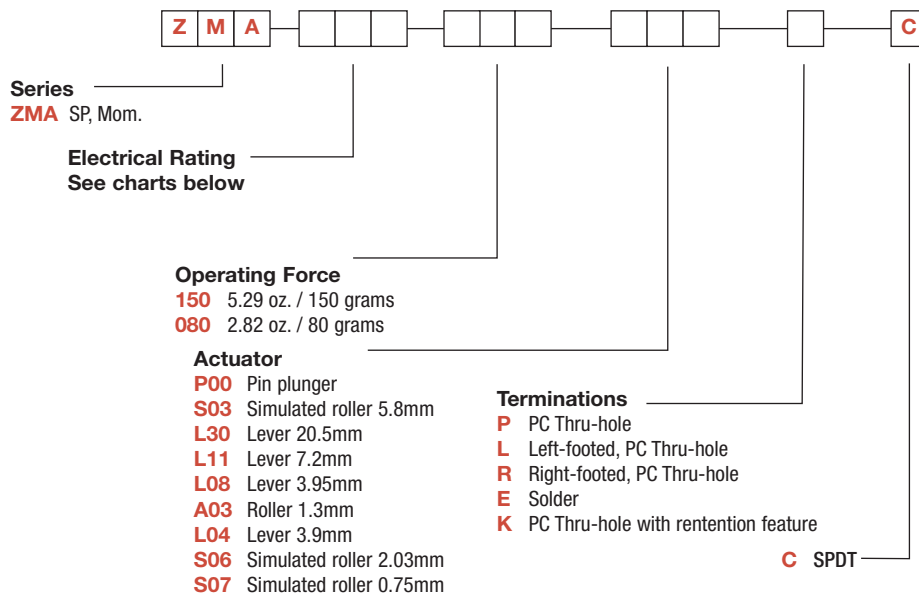
\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max.  
 @ 20 V AC or DC max.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-51 and J-53. For additional options not shown in catalog, consult Customer Service Center.



### Silver Contacts

Option Code	UL 1054	UL 61058-1	EIA 14	EIA 15
<b>00A</b>	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
<b>03A</b>	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
<b>01A</b>		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

### Gold Plated Contacts

Option Code	UL 1054	UL 61058-1	EIA 14	EIA 15
<b>G00</b>	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
<b>G03</b>	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
<b>G01</b>		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

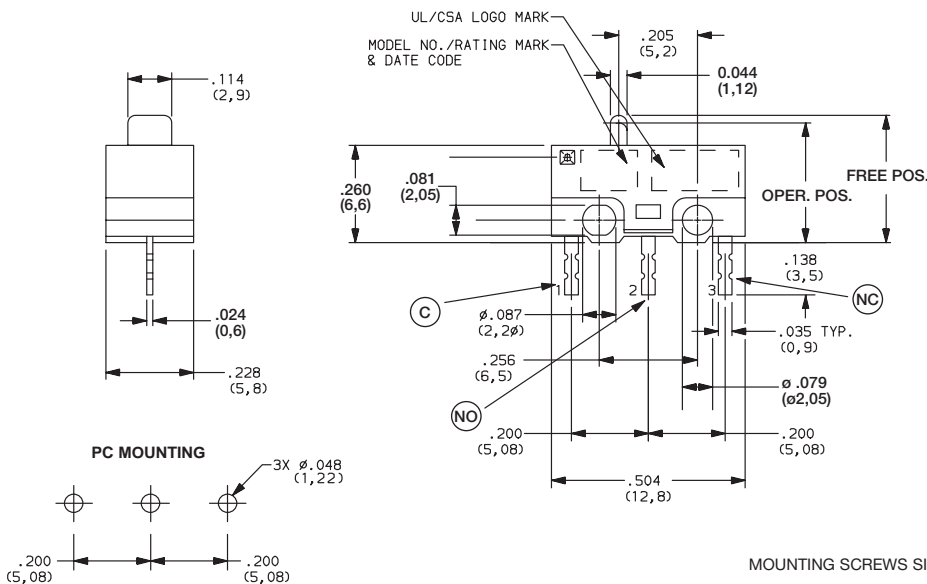


Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

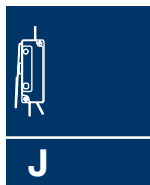
# ZMA Series Subminiature Snap-acting Switches

SERIES **Z M** ■ ■ ■ ■ ■ ■ ■ ■

**ZMA** SUBMINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY



ZMA03A150L04PC  
SPDT



ELECTRICAL RATING ■ ■ ■ ■ ■ ■ ■ ■

Snap-acting

## Silver Contacts

## Gold Plated Contacts

Option Code	UL cUL <sup>us</sup> 1054	UL cUL <sup>us</sup> 61058-1	14	15	Option Code	UL cUL <sup>us</sup> 1054	UL cUL <sup>us</sup> 61058-1	14	15
00A	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC		G00	0.1A 60 V DC 0.1A 125 V AC	0.1A 60 V DC 0.1A 125 V AC	0.1A 125 V AC	
03A	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC		G03	3 A 125 V AC	3 A 125 V AC 3 A 24 V DC	3A 125 V AC	
01A		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC	G01		1 A 24 V DC 1 A 125 / 250 V AC		1 A 24 V DC 1 A 125 / 250 V AC

\* Note: See Technical Data in section N of this catalog for RoHS compliant and compatible definition and specifications.

All models **cUL<sup>us</sup>** with all options.

Consult Customer Service center for availability and delivery of nonstandard ratings.

OPERATING FORCE ■ ■ ■ ■ ■ ■ ■ ■

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
150	5.29 150
080	2.82 80



Third Angle  
Projection

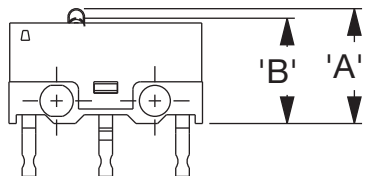
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



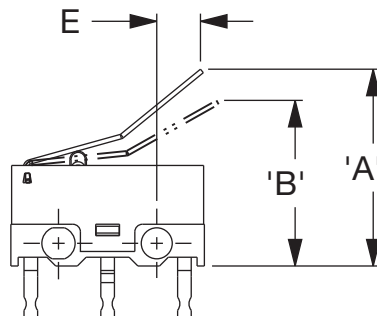
# ZMA Series Subminiature Snap-acting Switches

## ACTUATOR

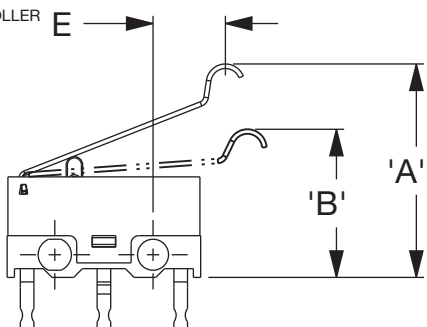
**P00** PIN PLUNGER



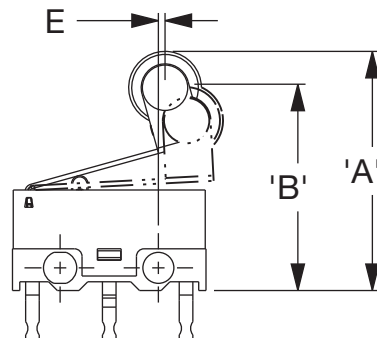
**L08** LEVER  
3.95MM



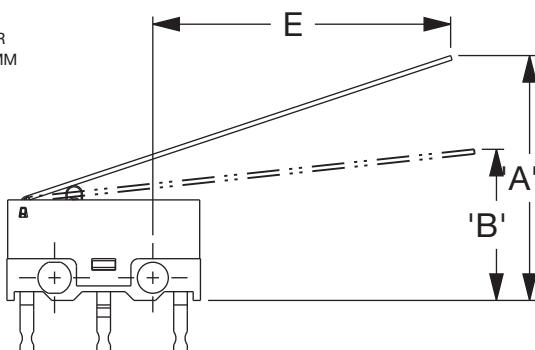
**S03** SIMULATED ROLLER  
5.8MM



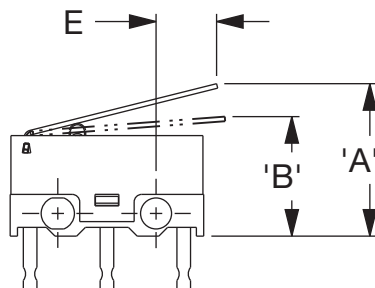
**A03** ROLLER  
1.3MM



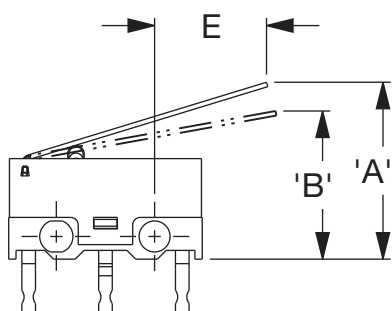
**L30** LEVER  
20.5MM



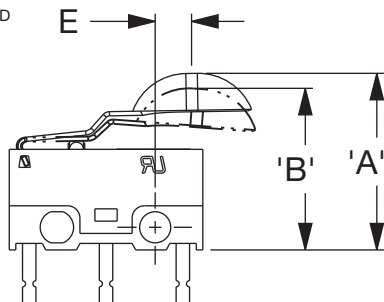
**L04** LEVER  
3.49MM



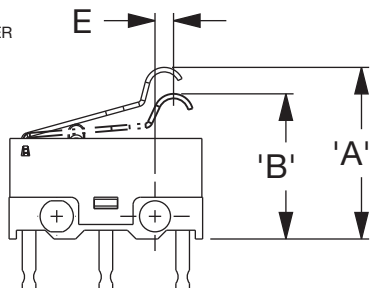
**L11** LEVER  
7.2MM



**S06** SIMULATED ROLLER  
2.03MM



**S07** SIMULATED ROLLER  
0.75MM



Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



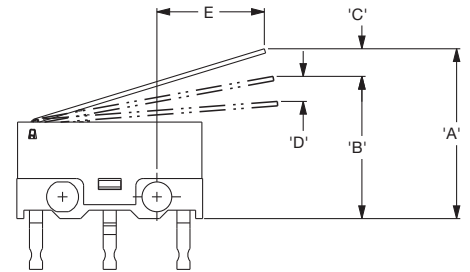
Snap-acting



# ZMA Series Subminiature Snap-acting Switches

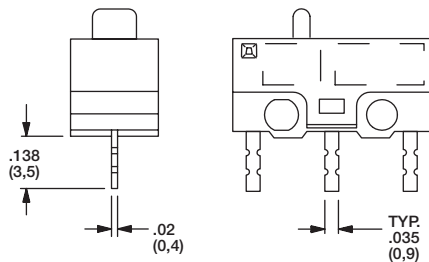
## SWITCH CHARACTERISTICS

CODE	OPER. FORCE MAX. (GRAMS)		REL. FORCE MIN. (GRAMS)		'A' FP MAX. (MM)	'B' OP MAX. (MM)	'C' PT MAX. (MM)	'D' OT MIN. (MM)	'E' MIN. (MM)
P00	80	150	21	35	7.35	6.9 ±0.3	0.62	0.2	
S03	25	43	5	7	14.2	9.8 ±0.9	3.5	0.7	5.41
L30 (80gf)	13	21	2	3	16.8	9.5 ±1.9	6.9	0.55	20.15
L30 (150 gf)	13	21	2	3	16.8	9.75 ±1.9	6.9	0.55	20.15
L11	25	39	4	6	11.7	8.68 ±1	4.4	0.6	7.33
L08	27	48	3	8	13.5	10.75 ±0.8	3.5	0.3	3.82
A03	34	65	6	10	16.55	13.65 ±1	3.9	0.5	0.56
L04	30	50	5	8	10.1	7.9 ±0.7	3.0	0.5	3.49
S06	33	49	5	11	12.43	10.7 ±0.8	1.43	1.25	1.97
S07	40	65	2	5	13.0	9.7 ±1	4.3	0.5	0.49

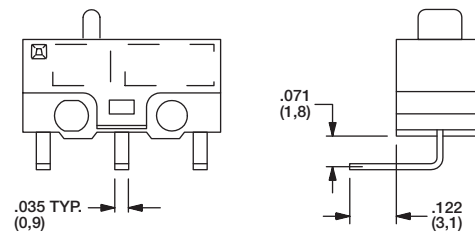


## TERMINATIONS

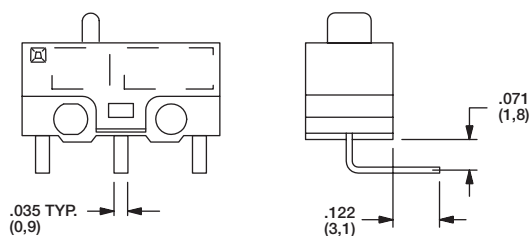
### P PC THRU-HOLE



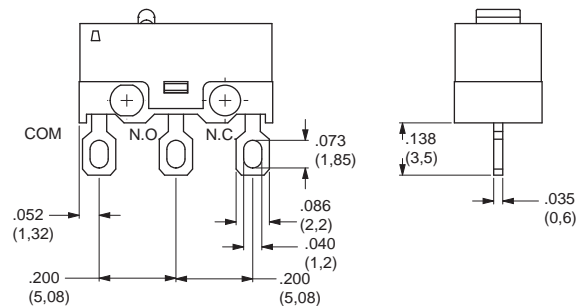
### L LEFT FOOTED, PC THRU-HOLE



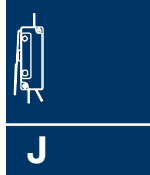
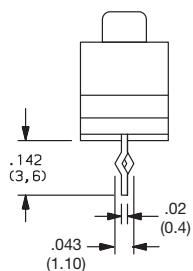
### R RIGHT FOOTED, PC THRU-HOLE



### E SOLDER



### K PC THRU-HOLE WITH RETENTION FEATURE



Snap-acting



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# ZMB Series Subminiature Snap-acting Switches



## Features/Benefits

- **Compact design**
- **Various operating forces**
- **Different lever options**
- **PCB or solder terminal options**
- **Detect interlock and movement**

## Typical Applications

- **Consumer electronics**
- **Communications**
- **Industrial meters**
- **Security systems**
- **Office equipment**

## Specifications

CONTACT ARRANGEMENT: SPDT  
 CONTACT RATING: 0.1 A @ 30 V DC  
 INITIAL CONTACT RESISTANCE: 50 mΩ max.  
 INSULATION RESISTANCE: 100 M Ω min. @ 500 VDC  
 DIELECTRIC STRENGTH: 1000 VAC (50-60 Hz)  
 MECHANICAL LIFE: 500,000 cycles  
 ELECTRICAL LIFE: 50,000 cycles  
 PRE-TRAVEL: 0.5 mm max.  
 OVER-TRAVEL: 0.5 mm min.  
 OPERATING TEMPERATURE: -20°C to + 70°C

## Materials

COVER / HOUSING: PBT (black)  
 KNOB: PBT (red)  
 CONTACT: Copper alloy, silver plated  
 TERMINALS: Copper alloy, silver plated  
 LEVER: Stainless steel

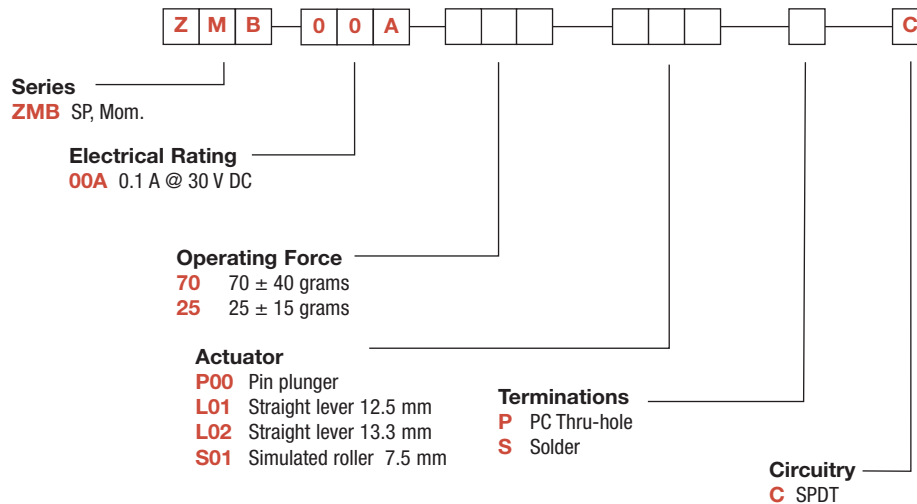
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-55 and J-56. For additional options not shown in catalog, consult Customer Service Center.

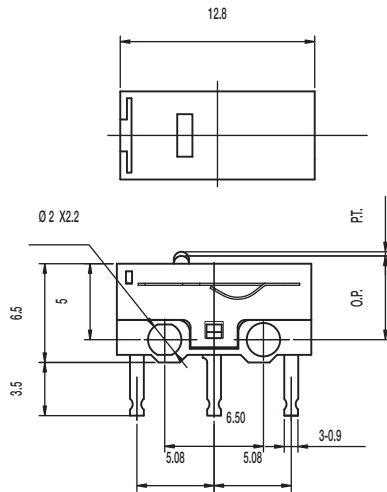


Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

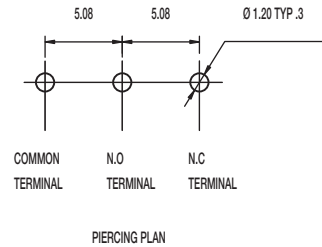
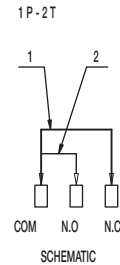
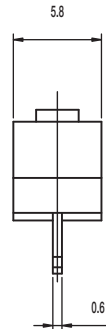
# ZMB Series Subminiature Snap-acting Switches

## ZMB00A70P00PC

PIN PLUNGER, PC THRU-HOLE

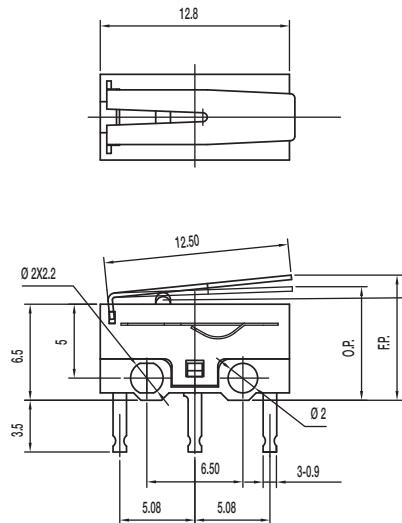


OPERATING FORCE:  $70 \pm 40$  gf  
 OPERATING POSITION (OP):  $5.5 \pm 0.30$  mm  
 FREE POSITION (FP): N/A

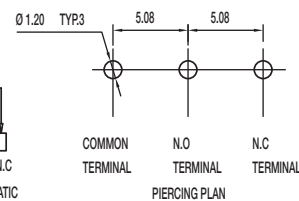
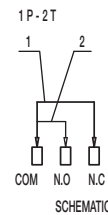
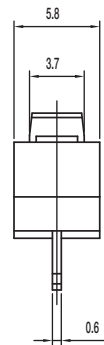


## ZMB00A25L01PC

STRAIGHT LEVER 12.5 MM, PC THRU-HOLE

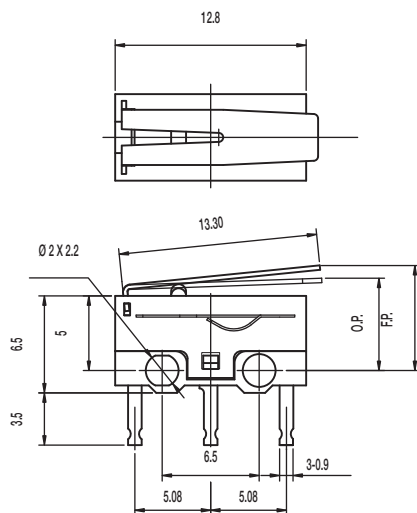


OPERATING FORCE:  $25 \pm 15$  gf  
 OPERATING POSITION (OP):  $7.2 \pm 0.8$  mm  
 FREE POSITION (FP): 10 mm max.

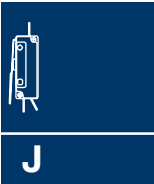
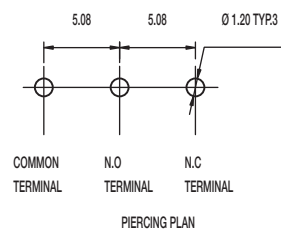
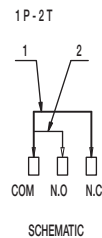
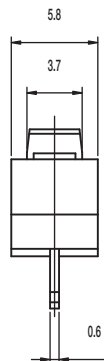


## ZMB00A25L02PC

STRAIGHT LEVER 13.3 MM, PC THRU-HOLE



OPERATING FORCE:  $25 \pm 15$  gf  
 OPERATING POSITION (OP):  $6.0 \pm 0.8$  mm  
 FREE POSITION (FP): 8.5 mm max.

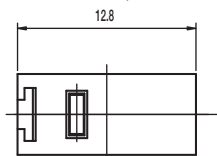


Snap-acting

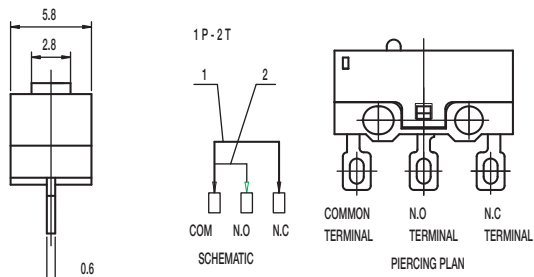
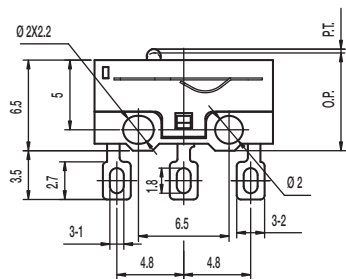
# ZMB Series Subminiature Snap-acting Switches

## ZMB00A70P00SC

PIN PLUNGER, SOLDER

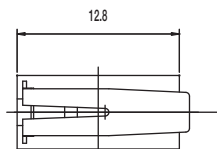


OPERATING FORCE:  $70 \pm 40$  gf  
 OPERATING POSITION (OP):  $7.0 \pm 0.30$  mm  
 FREE POSITION (FP): N/A

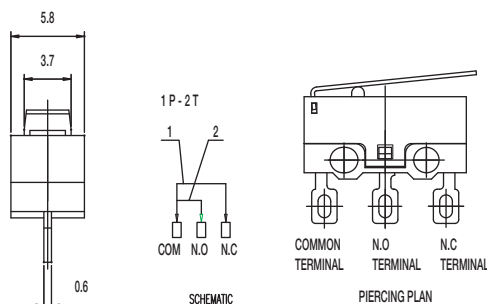
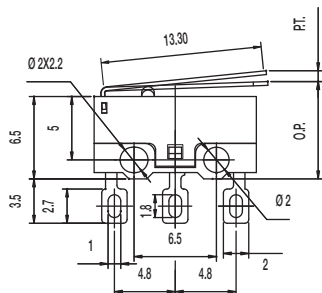


## ZMB00A25L02SC

STRAIGHT LEVER 13.3 MM, SOLDER

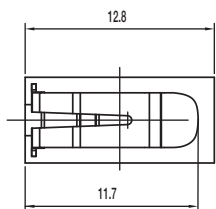


OPERATING FORCE:  $25 \pm 15$  gf  
 OPERATING POSITION (OP):  $7.5 \pm 0.8$  mm  
 FREE POSITION (FP): 10 mm max.

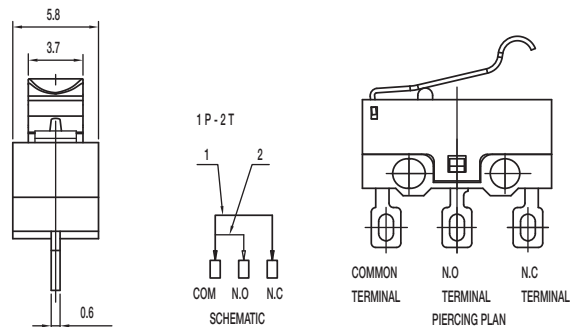
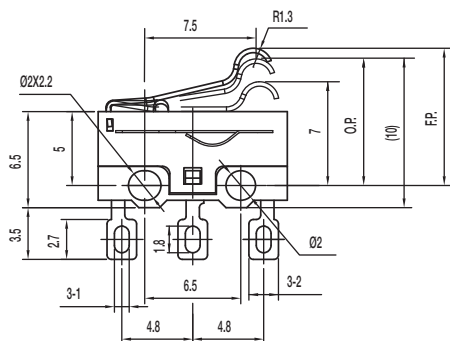


## ZMB00A25S01SC

SIMULATED ROLLER 7.5 MM, SOLDER



OPERATING FORCE:  $25 \pm 15$  gf  
 OPERATING POSITION (OP):  $8.5 \pm 0.8$  mm  
 FREE POSITION (FP): 9.5 mm max.



# ZMS Series Subminiature Snap-acting Switches (IP65)

## Features/Benefits

- **Reliable snap-acting mechanism**
- **Long electrical and mechanical life**
- **Compact size—Ideal when space is limited**
- **Various PCB terminals and actuators**
- **RoHS compatible**
- **IP67 with potted wires only**

## Typical Applications

- **PCB detection switch**
- **Communication devices**
- **Testing equipment**
- **Security/Alarm systems**
- **Consumer electronics**



UL61058-1  
UL1054



## Specifications

CONTACT RATING: 3A@ 125 V AC/ 3A@ 12 V DC, 0.01A @ 12 V DC  
ELECTRICAL LIFE: 100,000 cycles @ 0.01A 12V DC  
100,000 cycles @ 3A 12 V DC  
6,000 cycles @ 3A 125 V AC  
MECHANICAL LIFE: 500,000 cycles  
INSULATION RESISTANCE: 100 M ohm min.  
DIELECTRIC STRENGTH: 500 Vrms.  
OPERATING TEMPERATURE: -40°C + 85°C.  
OPERATING FORCE: 130 grams.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max.  
@ 20 V AC or DC max.

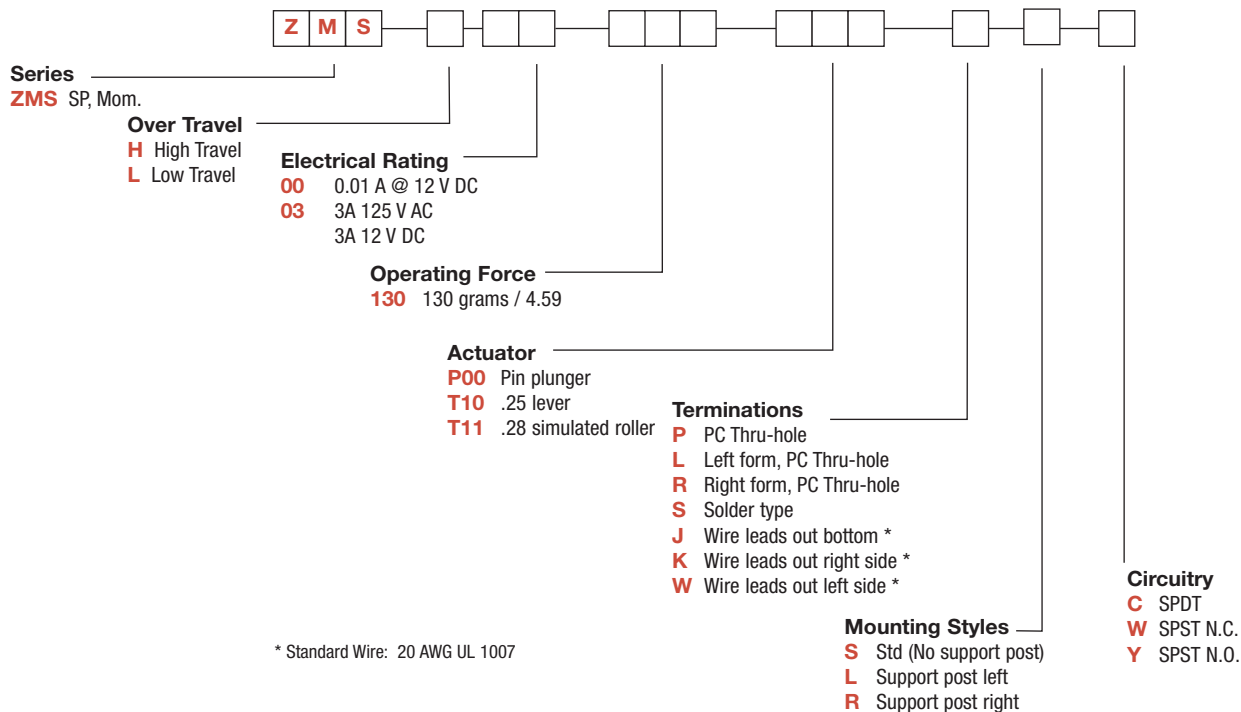
## Materials

CASE: Nylon  
COVER/ACTUATOR: PBT  
MOVABLE CONTACTS: 3 Amp silver alloy, 0.01A gold plating over silver alloy  
STATIONARY CONTACTS: 3 Amp silver alloy, 0.01 A gold plating over silver alloy  
TERMINALS: Brass, silver plated  
LEVER: Stainless steel

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-58 through J-60. For additional options not shown in catalog, consult Customer Service Center.



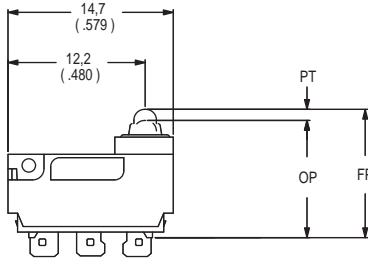
Snap-acting



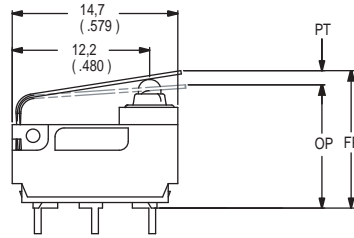
# ZMS Series Subminiature Snap-acting Switches (IP65)

## ACTUATOR

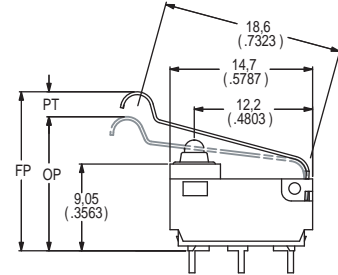
**P00** PIN PLUNGER (IP65)



**T10** .25 LEVER (IP65)



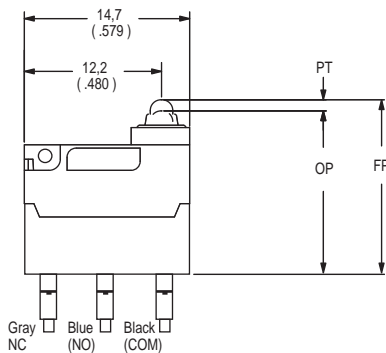
**T11** LEVER (IP65)



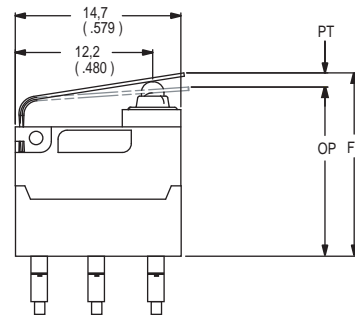
### SWITCH CHARACTERISTICS

Actuator code	Maximum Operate Force (grams/oz.)	Minimum Release Force (grams/oz.)	Free Position Max	Maximum Pre-travel	Operate Position	Maximum Differential	Low Overtravel min. (L)	High Overtravel min. (H)
<b>P00</b>	130 4.59	13 0.45	.472 (12)	0.032 (0,8)	.415 ± .012 (10.55 ± .3)	.012 (0,3)	0.031 (0,8)	0.068 (1,72)
<b>T10</b>	195 6.88	55 1.93	.604 (15.35)	0.152 (3.85)	.440 ± .020 (11.2 ± .5)	0.020 (0,5)	0.053 (1,35)	0.084 (2,14)
<b>T11</b>	160 5.64	45 1.58	.726 (18.45)	0.186 (4.8)	.539 ± .032 (13.7 ± .8)	0.030 (0,7)	0.062 (1,65)	0.101 (2,57)

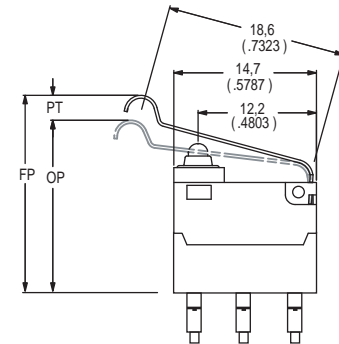
**P00** PIN PLUNGER (IP67)



**T10** .25 LEVER (IP67)



**T11** .28 LEVER (IP67)



### SWITCH CHARACTERISTICS "J" TERMINATION ONLY

Actuator code	Maximum Operate Force (grams/oz.)	Minimum Release Force (grams/oz.)	Free Position Max	Maximum Pre-travel	Operate Position	Maximum Differential	Low Overtravel min. (L)	High Overtravel min. (H)
<b>P00</b>	130 4.59	13 0.45	.650 (16.50)	0.032 (0,8)	.593 ± .020 (15.05 ± 0.5)	.012 (0,3)	0.031 (0,8)	0.068 (1,72)
<b>T10</b>	195 6.88	55 1.93	.781 (19.85)	0.152 (3.85)	.618 ± .028 (15.7 ± .7)	0.020 (0,5)	0.053 (1,35)	0.084 (2,14)
<b>T11</b>	160 5.64	45 1.58	.904 (22.95)	0.188 (4.8)	.717 ± .039 (18.2 ± 1.0)	0.030 (0,7)	0.062 (1,65)	0.101 (2,57)



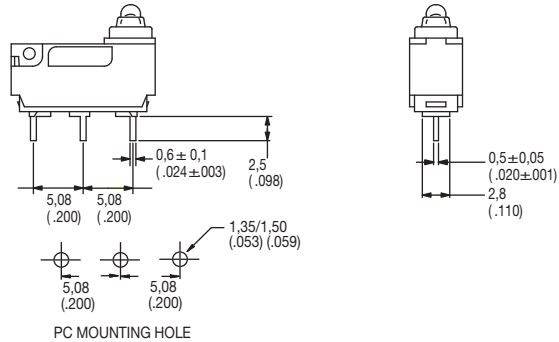
Third Angle Projection

Dimensions are shown: mm (inch)  
Specifications and dimensions subject to change

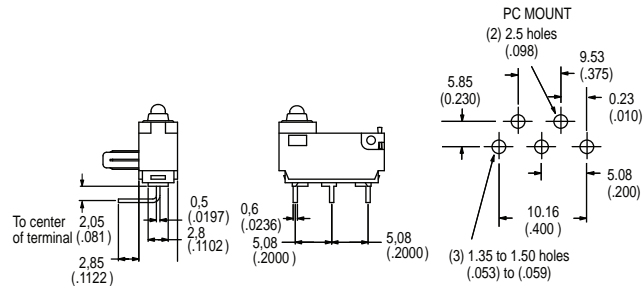
# ZMS Series Subminiature Snap-acting Switches (IP65)

## TERMINATIONS

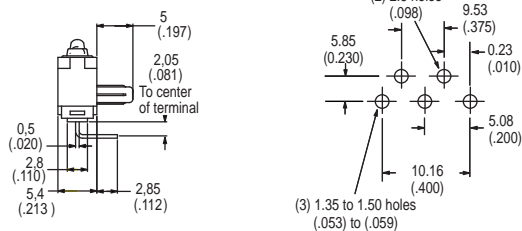
### P PC THRU-HOLE



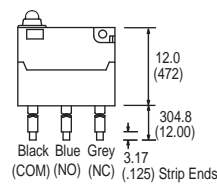
### L LEFT FOOTED, PC THRU-HOLE



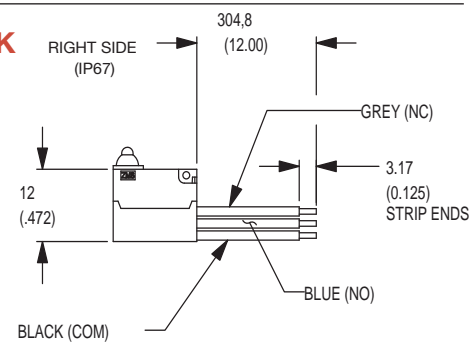
### R RIGHT FOOTED, PC THRU-HOLE



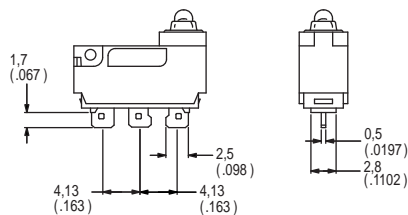
### J WIRE LEADS BOTTOM (IP67)



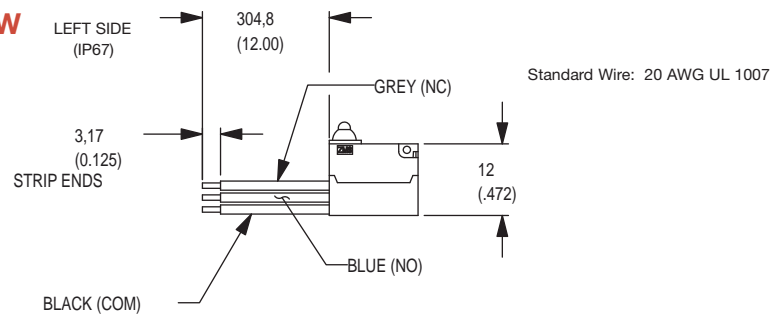
### K RIGHT SIDE (IP67)



### S SOLDER TYPE

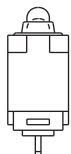


### W LEFT SIDE (IP67)

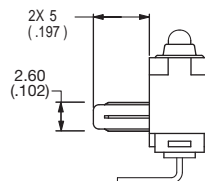


## MOUNTING STYLES

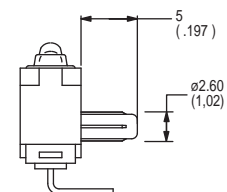
### S STD (NO SUPPORT POST)



### L SUPPORT POST LEFT



### R SUPPORT POST RIGHT

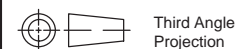


## CIRCUITRY

**C** SPDT (Single Pole, Double Throw)

**W** SPST, NC (Single Pole, Single Throw, Normally Closed)

**Y** SPST, NO (Single Pole, Single Throw, Normally Open)



Third Angle  
Projection

Dimensions are shown: mm (inch)  
Specifications and dimensions subject to change

**C&K**



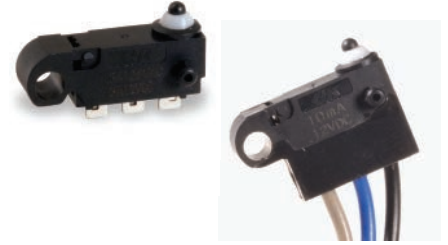
# ZMSM Series with Mounting Hole Subminiature Snap-acting Switches (IP65)

## Features/Benefits

- Reliable snap-acting mechanism
- Long electrical and mechanical life
- Various PCB terminals and actuators
- RoHS compatible
- IP67 with potted wires only

## Typical Applications

- Communication devices
- Testing equipment
- Security/Alarm systems



UL61058-1 

## Specifications

CONTACT RATING: 3A@ 125 V AC/ 3A@ 12 V DC, 0.01 A@ 12 V DC.  
ELECTRICAL LIFE: 100,000 cycles @ 0.01 A, 12 V DC / 100,000 cycles @ 3A, 12 V DC, 6,000 cycles @ 3A, 125 VAC  
INSULATION RESISTANCE: 100 M ohm min.  
DIELECTRIC STRENGTH: 500 Vrms.  
OPERATING TEMPERATURE: see chart below.  
OPERATING FORCE: 130 grams.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

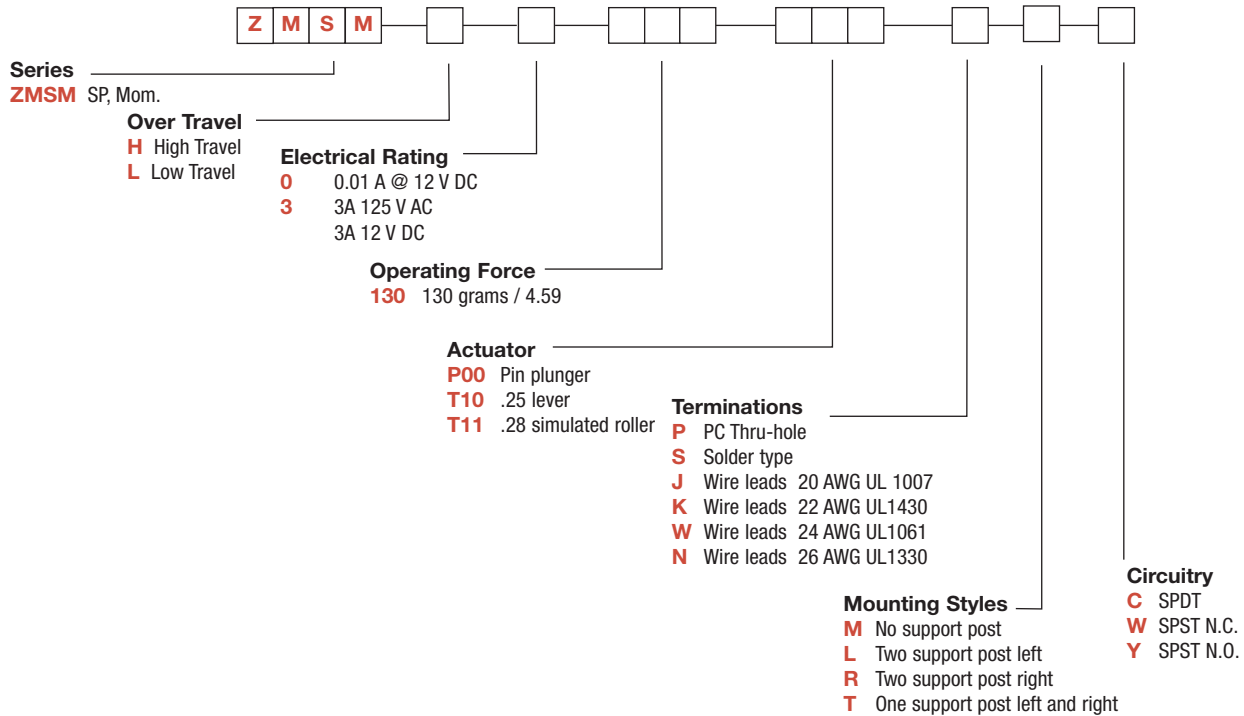
## Materials

CASE: Nylon  
COVER/ACTUATOR: PBT  
MOVABLE CONTACTS: 3 Amp silver, 0.01A gold  
STATIONARY CONTACTS: 3 Amp silver, 0.01A gold  
TERMINALS: Brass, Pre-plated with silver  
LEVER: Stainless steel

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-62 through J-64. For additional options not shown in catalog, consult Customer Service Center.



Dimensions are shown: mm  
Specifications and dimensions subject to change

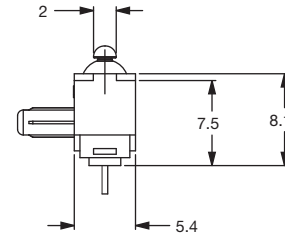
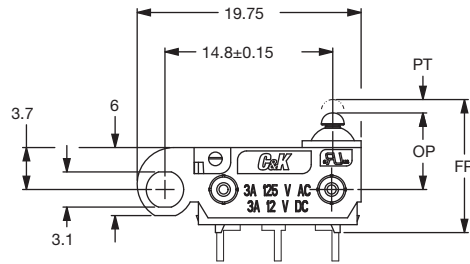
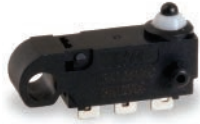


Snap-acting

# ZMSM Series with Mounting Hole Subminiature Snap-acting Switches (IP65)

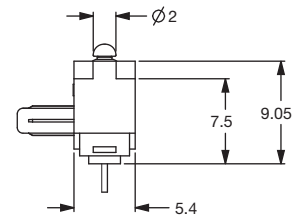
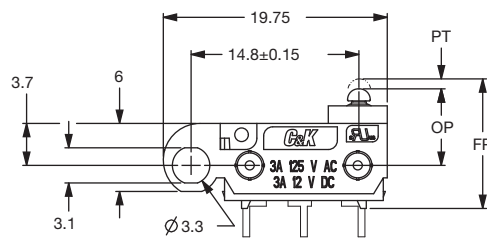
## SERIES

**ZMSMH** HIGH OVER TRAVEL



**ZMSML** LOW OVER TRAVEL

MODEL SHOWN: ZMSMHXXXP00PLC



MODEL SHOWN: ZMSMLXXXP00PLC



Snap-acting

## ELECTRICAL RATING

OPTION CODE	RoHS COMPLIANT*	RoHS COMPATIBLE*	CONTACT MATERIAL		ELECTRICAL RATING
			MOVABLE CONTACT	STATIONARY CONTACT	
<b>0</b>	Yes	Yes	Gold alloy		0.01 A @ 12 V DC
<b>3</b>	Yes	Yes	Silver alloy		3 AMPS @ 125 V AC 3 AMPS @ 12 V DC

Model **C&K** **US** with option "S" (solder type) only.  
Consult Customer Service center for availability and delivery of nonstandard ratings.

## OPERATING FORCE

OPTION CODE	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
<b>130</b>	130 4.59



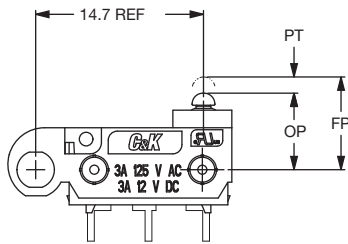
Dimensions are shown: mm  
Specifications and dimensions subject to change



# ZMSM Series with Mounting Hole Subminiature Snap-acting Switches (IP65)

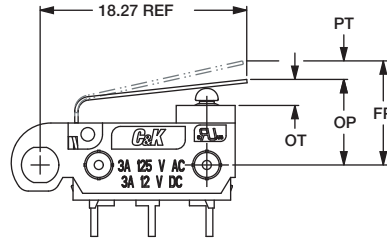
## ACTUATOR

**P00** PIN PLUNGER (IP65)



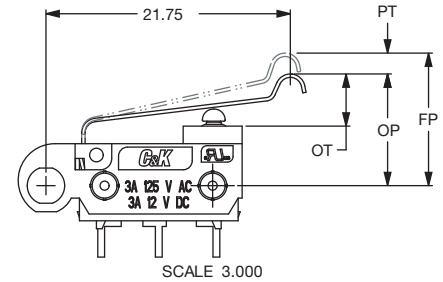
MODEL SHOWN: ZMSMLXXXXP00PLC

**T10** .25 LEVER (IP65)



MODEL SHOWN: ZMSMLXXXT10PLC

**T11** LEVER (IP65)



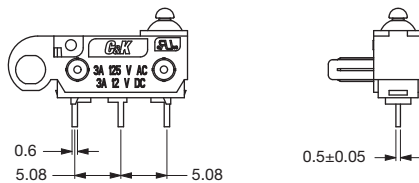
MODEL SHOWN: ZMSMLXXXT11PLC

### SWITCH CHARACTERISTICS

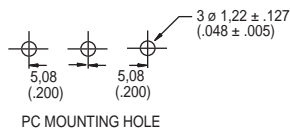
Actuator code	Maximum Operate Force (grams/oz.)	Minimum Release Force (grams/oz.)	Free Position Max (mm)	Maximum Pre-travel (mm)	Operate Position (mm)	Maximum Differential (mm)	Low Overtravel min. (mm)	High Overtravel min. (mm)
<b>P00</b>	130 4.59	13 0.45	7.35	0.8	6.75 ± 0.3	0.3	0.8	1.75
<b>T10</b>	195 6.88	55 1.93	10.70	3.85	7.40 ± 0.8	0.5	1.35	2.3
<b>T11</b>	160 5.64	45 1.58	13.80	4.8	9.90 ± 0.8	0.7	1.65	2.6

## TERMINATIONS

**P** PC THRU-HOLE (IP65)

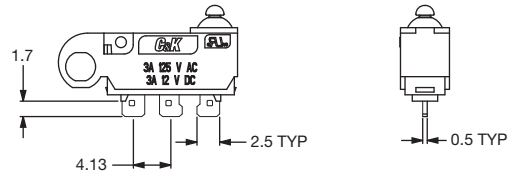


MODEL SHOWN: ZMSMHXXXXP00PLC



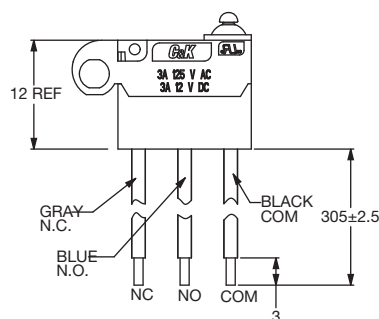
PC MOUNTING HOLE

**S** SOLDER TYPE (IP65)



MODEL SHOWN: ZMSMHXXXXP00SMC

**J** WIRE LEADS BOTTOM (IP67)



Standard Wire: 20 AWG UL 1007

Available options - must specify

22AWG UL1430

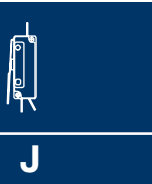
24AWG UL1061

26AWG UL1330



Third Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

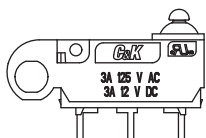


Snap-acting

# ZMSM Series with Mounting Hole Subminiature Snap-acting Switches (IP65)

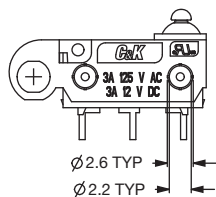
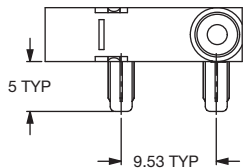
## MOUNTING STYLES

**M** NO SUPPORT POSTS



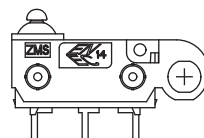
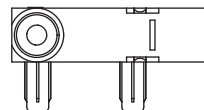
MODEL SHOWN:  
ZMSMHXXXXP00PMC

**L** TWO SUPPORT POSTS LEFT



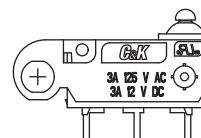
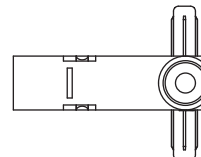
POSTS LEFT  
MODEL SHOWN:  
ZMSMHXXXXP00PLC

**R** TWO SUPPORT POSTS RIGHT



POSTS RIGHT  
MODEL SHOWN:  
ZMSMHXXXXP00PRC

**T** ONE SUPPORT POST LEFT & RIGHT



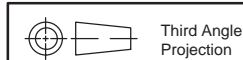
LEFT & RIGHT  
MODEL SHOWN:  
ZMSMHXXXXP00PTC



Snap-acting

## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST, NC (Single Pole, Single Throw, Normally Closed)
- Y** SPST, NO (Single Pole, Single Throw, Normally Open)



Dimensions are shown: mm  
Specifications and dimensions subject to change



# MDS Series Micro Snap-acting Detect Switches

## Features/Benefits

- Snap-acting tactile feel
- Small package size
- Available in vertical or right angle PCB mount
- RoHS compliant and compatible

## Typical Applications

- Detect the presence of a mechanical device
- Medical devices
- Consumer electronic devices
- ATCA applications



## Specifications

CONTACT RATING: 300mA @ 30 VDC.  
 MECHANICAL & ELECTRICAL LIFE: 30,000 operations.  
 CONTACT RESISTANCE: 100 m Ω max. initial  
 OPERATING TEMPERATURE: -25°C to +70°C.  
 SOLDERABILITY: According to lead free solder profiles.  
 PACKAGING: Available in bulk or tape and reel.  
 OPERATING FORCE: 50g Max.  
 RELEASE FORCE: 3g Min.

## Materials

BASE: PA9T  
 COVER & ACTUATOR: PA9T  
 MOVABLE CONTACT: Copper alloy, silver plated.  
 STATIONARY CONTACTS: Copper alloy, silver plated.  
 TERMINALS: Copper alloy, silver plated.

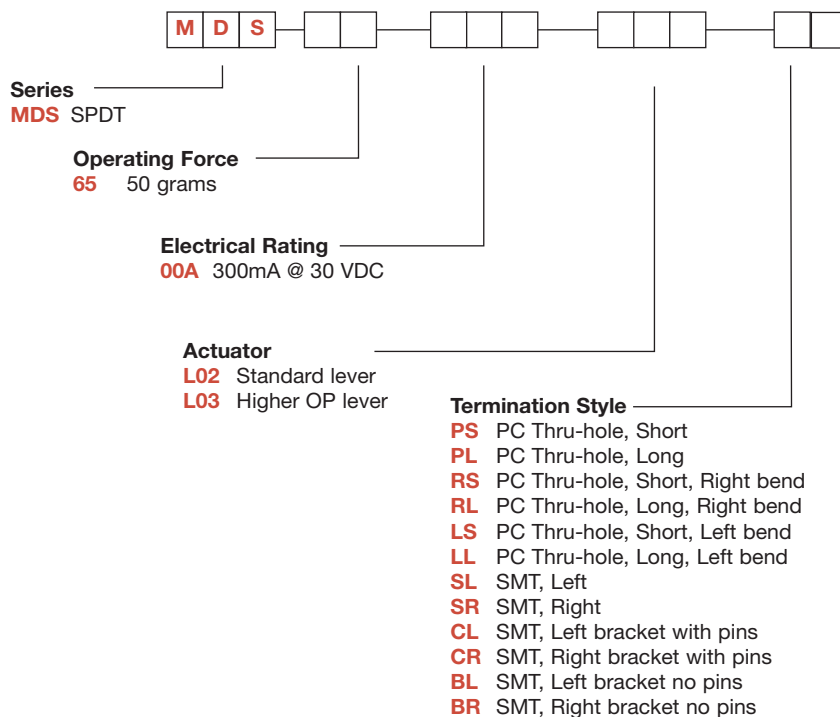
**NOTE:** MDS series is RoHS compliant, and compatible. See technical data section of this catalog for RoHS compliant and compatible definitions and specifications.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



## Build-A-Switch

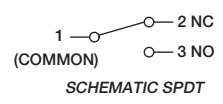
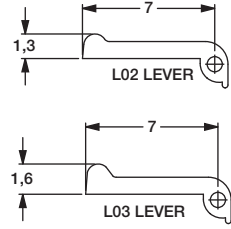
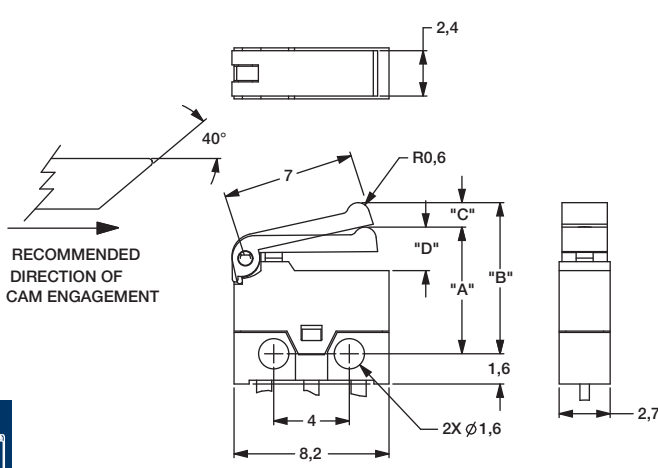
To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-66 through J-70. For additional options not shown in catalog, consult Customer Service Center.



Snap-acting

# MDS Series Micro Snap-acting Detect Switches

## SERIES **MDS** ■■■■■■■■



OPERATING CHARACTERISTICS			
		LEVER L02	LEVER L03
OPERATING POSITION	DIM 'A'	6.7±0.5	7.0 +/-0.5
FREE POSITION	DIM 'B'	8 MAX	8.5 MAX
PRETRAVEL	DIM 'C'	1.8 MAX	1.8 MAX
OVER TRAVEL	DIM 'D'	0.3 MIN	0.3 MIN
CONTACT RATING		0.3A @ 30 VDC	0.3A @ 30VDC
OPERATING FORCE		50 GRAMS F. MAX	50 GRAMS F. MAX

Snap-acting

## OPERATING FORCE ■■■■■■■■

OPTION CODE	OPERATING FORCE
<b>65</b>	50 grams max.

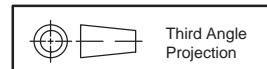
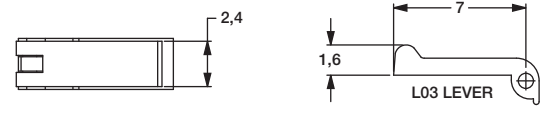
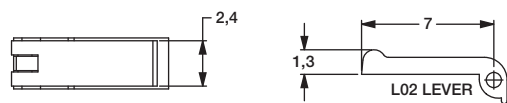
## ELECTRICAL RATING ■■■■■■■■

OPTION CODE	ELECTRICAL RATING
<b>00A</b>	300mA @ 30 V DC

## ACTUATOR ■■■■■■■■

**L02** STANDARD LEVER

**L03** HIGHER OP LEVER



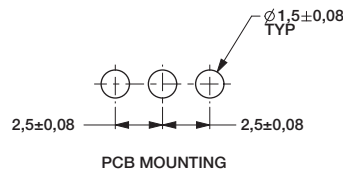
Dimensions are shown: mm  
Specifications and dimensions subject to change



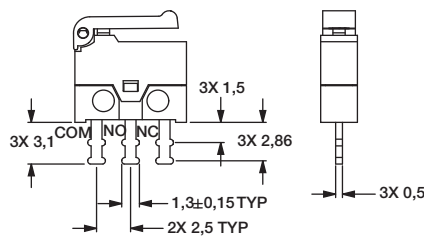
# MDS Series Micro Snap-acting Detect Switches

## TERMINATIONS

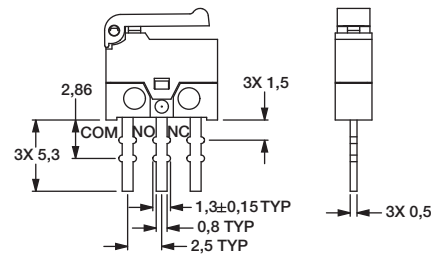
### PCB Mounting Pattern



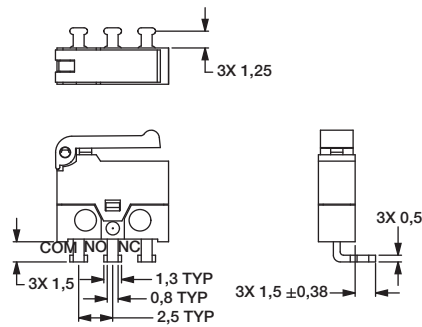
### PS PC THRU-HOLE, SHORT STRAIGHT



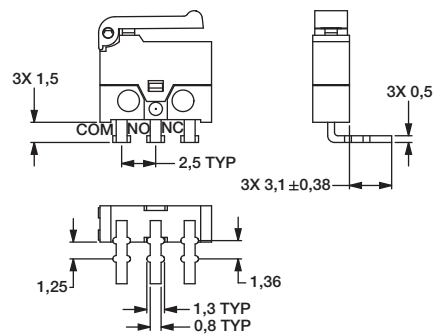
### PL PC THRU-HOLE, LONG STRAIGHT



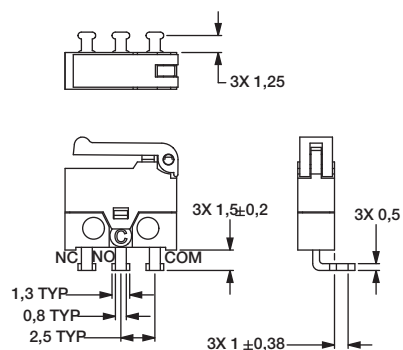
### RS PC THRU-HOLE, SHORT RIGHT BEND



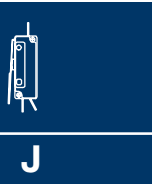
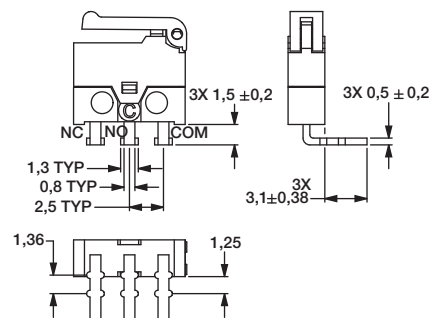
### RL PC THRU-HOLE, LONG SHORT BEND



### LS PC THRU-HOLE, SHORT LEFT BEND



### LL PC THRU-HOLE, LONG LEFT BEND

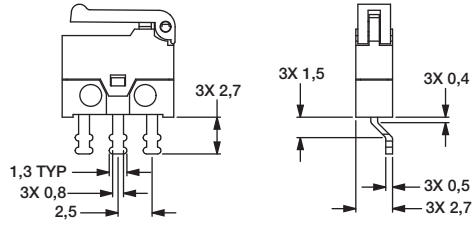


Snap-acting

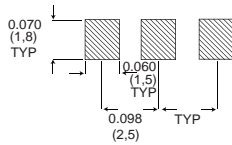
# MDS Series Micro Snap-acting Detect Switches

## TERMINATIONS

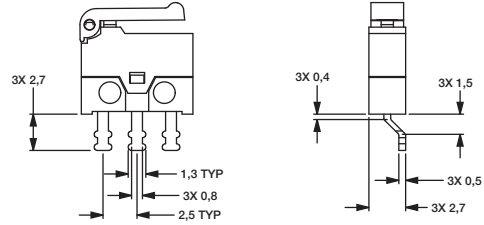
**SL** SMT, LEFT MOUNT



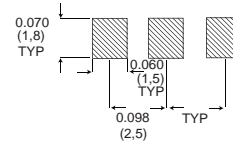
**SMT Mounting Pattern**



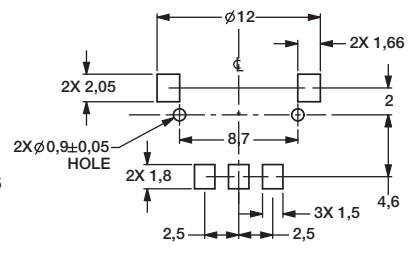
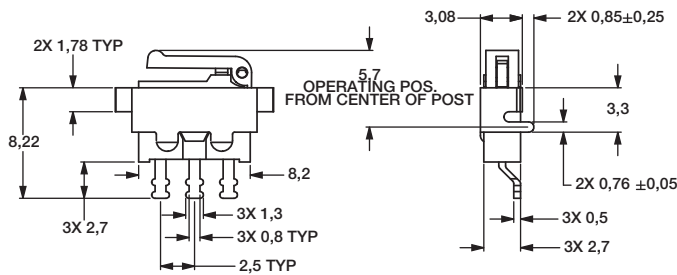
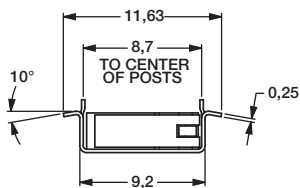
**SR** SMT, RIGHT MOUNT



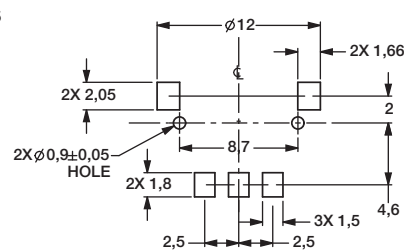
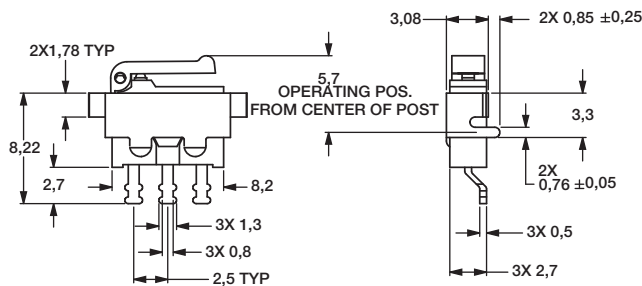
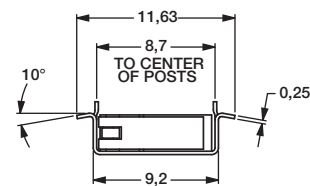
**SMT Mounting Pattern**



**CL** SMT, LEFT BRACKET WITH PINS



**CR** SMT, RIGHT BRACKET WITH PINS



Snap-acting



Third Angle Projection  
Dimensions are shown: mm  
Specifications and dimensions subject to change

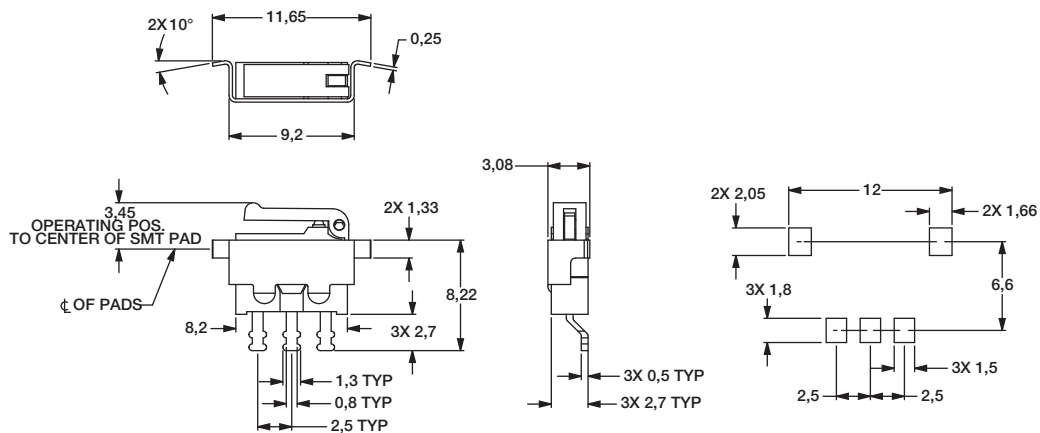




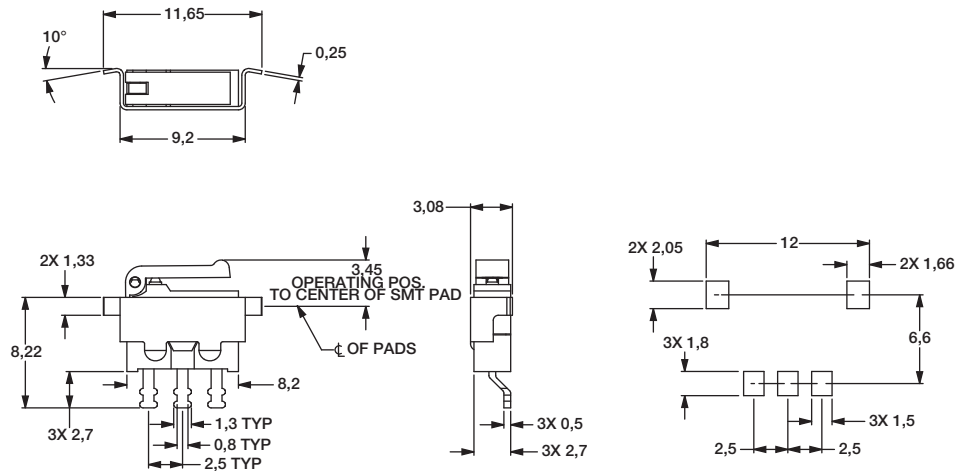
# MDS Series Micro Snap-acting Detect Switches

## TERMINATIONS

**BL** SMT, LEFT BRACKET NO PINS



**BR** SMT, RIGHT BRACKET NO PINS



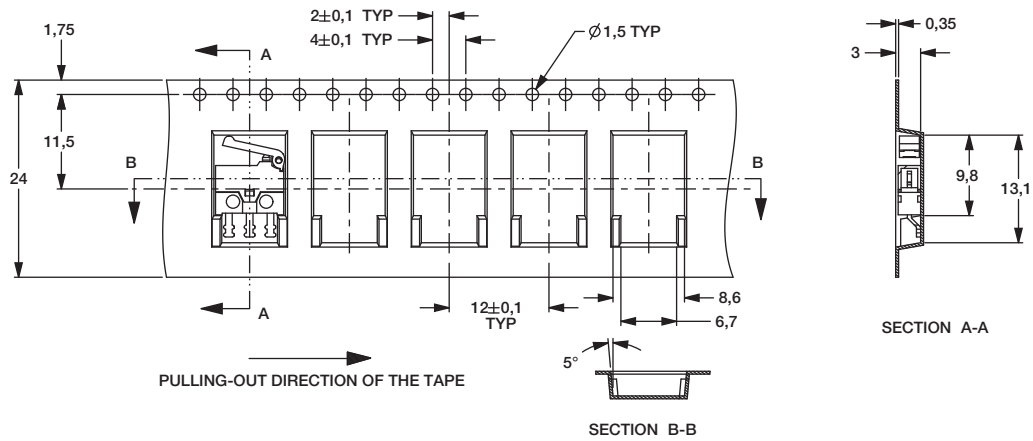
Snap-acting

# MDS Series Micro Snap-acting Detect Switches

## TAPE AND REEL

**SL** SMT, LEFT MOUNT

**SR** SMT, RIGHT MOUNT

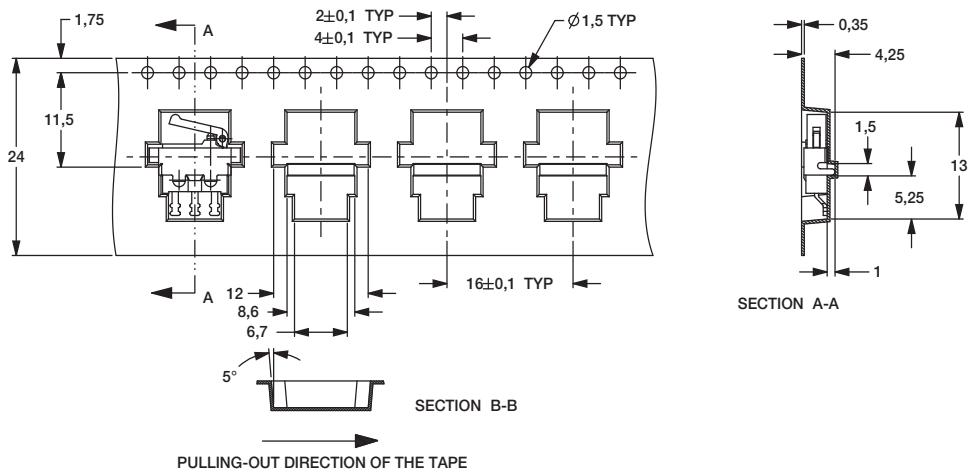


**CL** SMT, LEFT MOUNT

**CR** SMT, RIGHT MOUNT

**BL** SMT, LEFT MOUNT

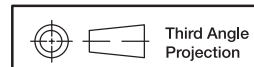
**BR** SMT, RIGHT MOUNT



Supplied in carrier tape meeting the EIA-481-2 standard for 24mm tape.

Packaging quantity: SL and SR; 1,600 pieces per reel  
CL, CR, BL and BR; 1,000 pieces per reel

Snap-acting



Dimensions are shown: mm  
Specifications and dimensions subject to change

# HB Series Single Pole Standard Precision Snap-acting Switches

## Features/Benefits

- Low differential travel, high repeatability
- Long life—150,000 cycles typical
- Single and double pole circuitry
- Sealed actuator and case

## Typical Applications

- Thermostats
- Motors
- Industrial controls



## Specifications

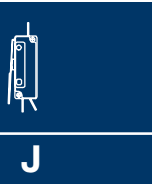
CONTACT RATING: From low level\* to 20 AMPS @ 480 V AC; see ELECTRICAL RATING option section for complete listings.  
 ELECTRICAL LIFE: 150,000 cycles at 20 AMPS @ 250 V AC. consult Customer Service Center for typical life at other ratings.  
 INSULATION RESISTANCE: 1,000 M ohm min.  
 DIELECTRIC STRENGTH: 1,500 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -67°F to 302°F (-55°C to 150°C).  
 OPERATING FORCE: From 4 oz. to 26 oz. max. at actuator button available.  
 MOUNTING SCREWS: Torque 3 in/lbs max.  
 (Note: Exceeding 3 in/lbs torque may change operating characteristics and increase the possibility of cracking switch case).  
 TERMINAL SCREWS: Torque 4 in/lbs max.  
 PANEL MOUNTING BUSHING: Torque 4-6 in/lbs max.  
 DEGREE OF PROTECTION: IP65; Dust-proof, water splash and dew condensation.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

## Materials

SWITCH HOUSING: Heat resistant/electrical grade phenolic.  
 INSERTS: Brass alloy.  
 ACTUATOR BUTTON: Moisture resistant phenolic.  
 SPRING: Copper alloy.  
 PIVOT: Brass alloy.  
 MOVABLE CONTACTS: Gold alloy for ratings 1 AMP or less. Fine silver for ratings greater than 1 AMP and motor load ratings less than 1/2 HP @ 125 V AC. Silver alloy for motor load ratings 1/2 HP @ 125 V AC or greater.  
 STATIONARY CONTACTS: Gold alloy for ratings 1 AMP or less. Fine silver welded to copper base for ratings greater than 1 AMP and motor load ratings less than 1/2 HP @ 125 V AC. Silver alloy on copper base for motor load ratings 1/2 HP @ 125 V AC or greater.  
 TERMINALS: Brass alloy, bright tin plated.

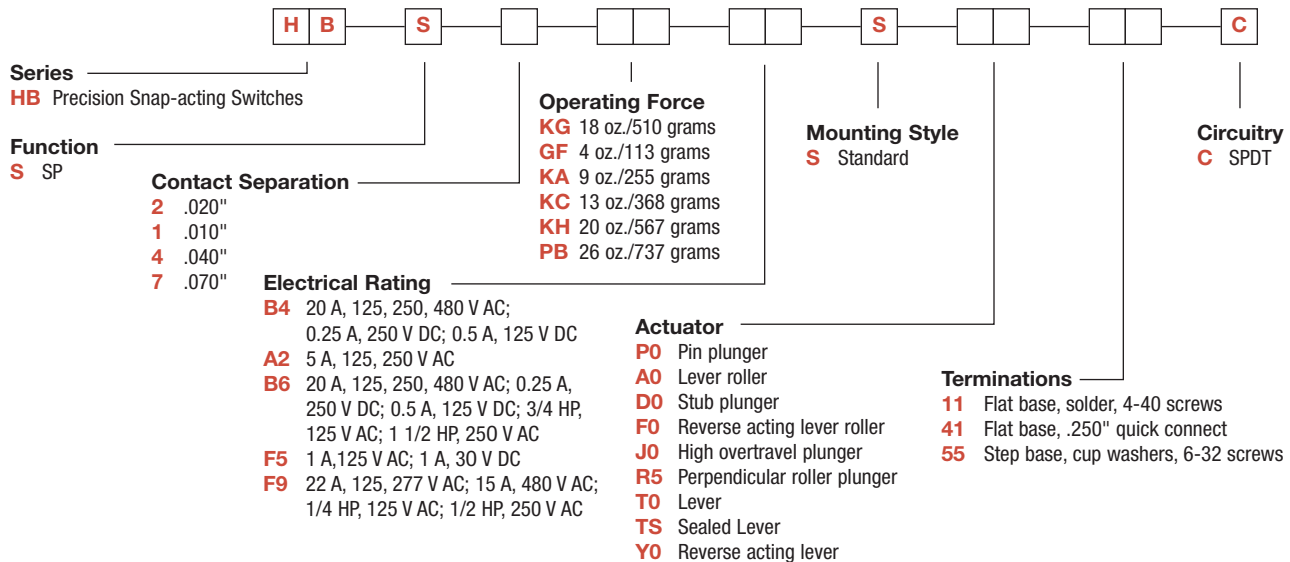
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-72 through J-76. For additional options not shown in catalog, consult Customer Service Center.



Dimensions are shown: mm  
 Specifications and dimensions subject to change

# HB Series Single Pole Standard Precision Snap-acting Switches

## Sealed Actuator and Case

To provide reliable service under environmental conditions that might damage standard precision switches, various HB Series switch models are sealed against the entrance of airborne contaminants and/or splashing liquids. The clearance between the operating plunger and the cover is sealed with a silicone boot and the base cover joint is sealed with an epoxy adhesive. These models are designed to meet requirements of IP65 (dust proof, water splash and dew condensation). For additional information on sealed switches, consult our Customer Service Center.

## SERIES

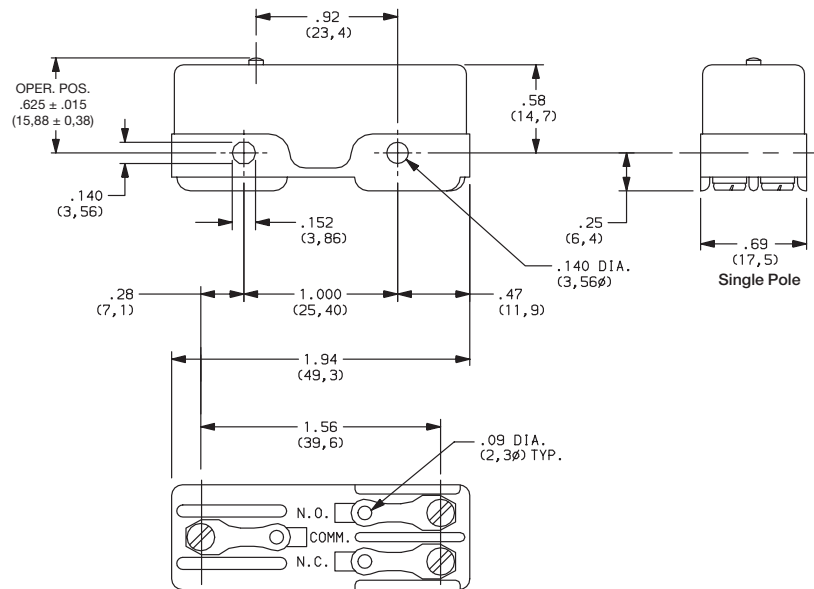
**HB** PRECISION SNAP-ACTING SWITCHES

## FUNCTION

**S** SINGLE POLE SWITCH



Snap-acting

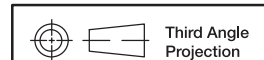
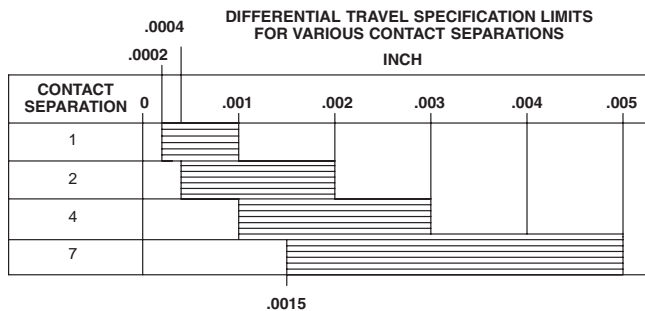


**NOTE:** To select switching function, see CIRCUITRY section, page J-52.

## CONTACT SEPARATION

OPTION CODE	NOMINAL CONTACT SEPARATION (in./mm)
<b>2</b>	.020 (0,51)
<b>1</b>	.010 (0,25)
<b>4</b>	.040 (1,02)
<b>7</b>	.070 (1,78)

Switches with 1 AMP rating (option code 'F5') are available only with .020 contact separation (option '2').  
Switches with 1/2 HP, 125 V AC rating or greater (option codes 'B5 and B6') are not available with .010 contact separation (option code '1').



Dimensions are shown in (mm)

Specifications and dimensions subject to change

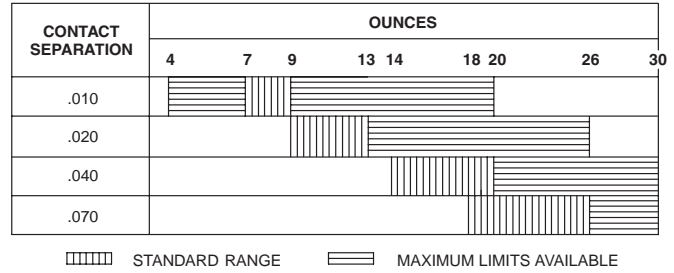


# HB Series Single Pole Standard Precision Snap-acting Switches

## OPERATING FORCE

OPTION CODE	MAXIMUM OPERATING FORCE (OZ./GRAMS)	STANDARD CONTACT SEPARATION (inch)
<b>KG</b>	18 510	.020
<b>GF</b>	4 115	.010
<b>KA</b>	9 255	.010
<b>KC</b>	13 370	.020
<b>KH</b>	20 570	.040
<b>PB</b>	26 740	.070

OPERATING FORCE SPECIFICATION LIMITS FOR VARIOUS CONTACT SEPARATIONS



**NOTE:** All listed differential travel characteristics are based on standard operating force and contact separation. For any other force or contact separation, consult Customer Service Center. Operating force varies with actuator option, see ACTUATOR option section.

## ELECTRICAL RATING

OPTION CODE	MOVABLE CONTACT	STATIONARY CONTACT	ELECTRICAL RATING
<b>B4</b>	Fine silver.	Fine silver welded to copper base.	20 AMPS @ 125, 250 & 480 V AC; 0.25 AMPS @ 250 V DC; 0.5 AMPS @ 125 V DC (UL).
<b>A2</b>			5 AMPS @ 125 & 250 V AC (UL).
<b>B6</b>	Precious metal alloy.	Precious metal alloy.	20 AMPS @ 125, 250 & 480 V AC; 0.25 AMP @ 250 V DC; 0.5 AMP @ 125 V DC; 3/4 HP @ 125 V AC; 1 1/2 HP @ 250 V AC (UL).
<b>F5</b>	Gold alloy.	Gold alloy.	Low level* to 1 AMP @ 125 V AC; 1 AMP @ 30 V DC (UL).
<b>F9</b>	Fine silver.	Fine silver welded to copper base.	22 AMPS @ 125 & 277 V AC; 15 AMPS @ 480 V AC; 1/4 HP @ 125 V AC; 1/2 HP @ 250 V AC; 277 V AC (UL).

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

### AVAILABLE COMBINATIONS

ELECTRICAL RATING	OPERATING FORCE (oz.)					
	4 GF	9 KA	13 KC	18 KG	20 KH	26 PB
A2	•	•	•	•	•	•
B4	x	•	•	•	•	•
B6	x	x	x	•	•	•
F5	x	x	•	•	•	•
F9	x	x	x	•	•	•

• AVAILABLE  
x NOT AVAILABLE

All models with all options

Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.



Dimensions are shown: Inch (mm)

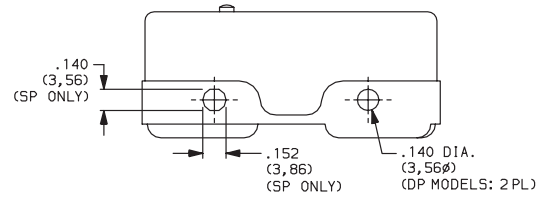
Specifications and dimensions subject to change



# HB Series Single Pole Standard Precision Snap-acting Switches

## MOUNTING STYLE

**S** Standard



**NOTE:** Mounting holes will accept pins or screws of .139 dia. (3,53) max. on 1.000 ± .002 (25,4 ± 0,05) centers.

**NOTE:** Torque mounting screws 3 inlbs max.

## ACTUATOR

OPTION CODE	NO. POLES	FIG.	DIM. A	DIM. B	DIM. C	DIM. D
<b>A0</b>	SP	1	.86 (21,8)	1.120 ± .060 (28,45 ± 1,52)	.38 dia. (9,70)	1.03 (26,2)
<b>D0</b>	SP	3	.92 (23,4)	.844 ± .020 (21,44 ± 0,51)	—	—
<b>F0</b>	SP	2	.09 (2,3)	1.120 ± .050 (28,45 ± 1,27)	.38 dia. (9,70)	.74 (18,8)
<b>J0</b>	SP	4	.86 (21,8)	.860 ± .030 (21,84 ± 0,76)	—	—
<b>P0</b>	SP	5	.92 (23,4)	.625 ± .010 (15,88 ± 0,25)	—	—
<b>R5</b>	SP	6	.92 (23,4)	.62 (15,7)	.50 dia. (12,70)	0.61 (15,5)
<b>T0</b>	SP	7	1.310 (33,27)	.720 ± .060 (18,28 ± 1,52)	1.03 dia. (26,20)	—
<b>TS*</b>	SP	7	1.47 (37,3)	.720 ± .060 (18,28 ± 1,52)	1.03 dia. (26,20)	—
<b>Y0</b>	SP	8	.05 (1,3)	.720 ± .030 (18,29 ± 0,76)	.74 dia. (18,80)	2.65 (6,73)

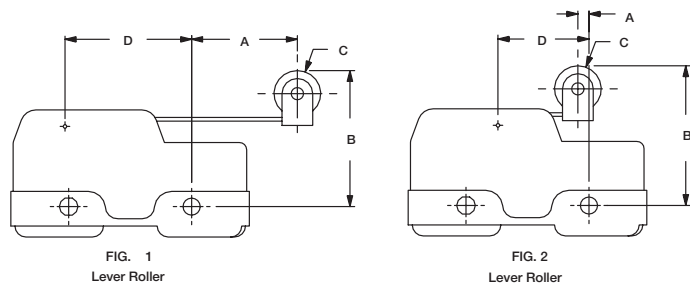


FIG. 1  
Lever Roller

FIG. 2  
Lever Roller

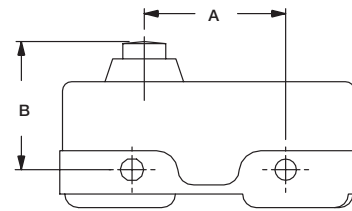


FIG. 3  
Stub Plunger

Snap-acting

\* Actuators sealed against the entrance of airborne contaminants and/or splashing liquids.

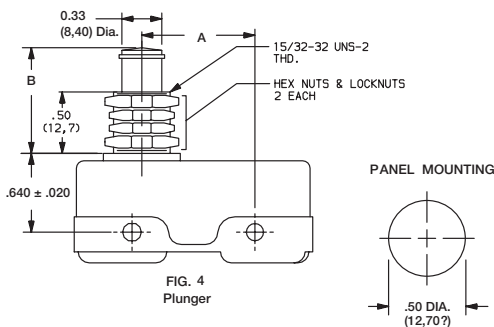


FIG. 4  
Plunger

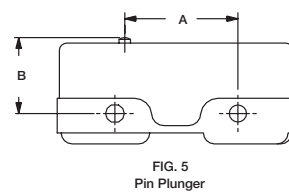


FIG. 5  
Pin Plunger

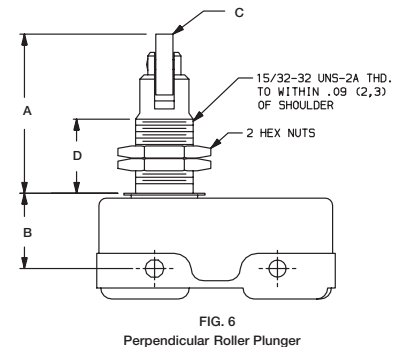


FIG. 6  
Perpendicular Roller Plunger

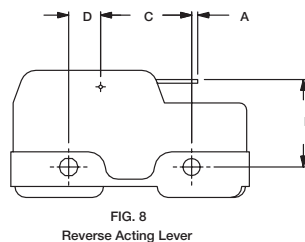


FIG. 8  
Reverse Acting Lever

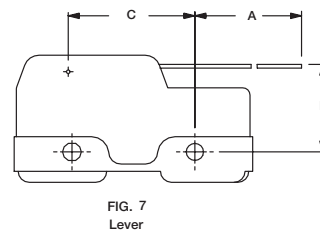
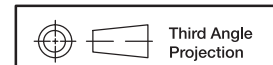


FIG. 7  
Lever



Third Angle Projection

Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change



# HB Series

## Single Pole Standard Precision Snap-acting Switches

### ACTUATOR

	OPTION CODE	ACTUATOR								* SEALED ACTUATOR
		A0	D0	F0	J0	P0	R5	T0	Y0	TS
<b>MAXIMUM OPERATING FORCE (OZ./GRAMS)</b>	GF	—	—	—	—	4 115	—	—	—	—
	KA	3 85	9.5 269	10 284	10 284	9 255	10 284	2 60	10 284	2 56
	KC	—	13 370	10 284	13 370	13 370	13 370	—	10 284	—
	KG	3.5 100	—	—	—	18 510	—	2.5 71	—	2.5 71
	KH	4 115	20 570	20 570	20 570	20 570	20 570	3 85	20 570	3 85
	PB	4.5 130	26 740	20 570	26 740	26 740	26 740	3.5 100	20 570	3.5 100
<b>MINIMUM RELEASE FORCE (OZ./GRAMS)</b>	GF	—	—	—	—	1 28	—	—	—	—
	KA	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14
	KC	1.7 48	4 110	3 85	4 110	4 110	4 110	—	3 85	—
	KG	.75 21	—	—	—	4 110	—	.5 14	—	.5 14
	KH	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14
	PB	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14

**NOTE:** For basic switch operating forces, see page J-71. \* Actuators sealed against the entrance of airborne contaminants and/or splashing liquids.

	OPTION CODE	ACTUATOR								* SEALED ACTUATOR
		A0	D0	F0	J0	P0	R5	T0	Y0	TS
<b>MAXIMUM DIFFERENTIAL TRAVEL (IN/MM)</b>	GF	—	—	—	—	.0005 (0,013)	—	—	—	—
	KA	.020 (0,51)	.0005 (0,013)	.005 (0,13)	—	.0005 (0,013)	—	.047 (1,19)	.005 (0,13)	.047 (1,19)
	KC	—	.002 (0,05)	.008 (0,20)	—	.002 (0,05)	—	—	.009 (0,23)	—
	KG	.062 (1,57)	—	—	—	.003 (0,08)	—	.078 (1,98)	—	.078 (1,98)
	KH	.080 (2,03)	.003 (0,76)	.020 (0,51)	—	.003 (0,08)	—	.093 (2,36)	.020 (0,51)	.093 (2,36)
	PB	.125 (3,18)	.007 (0,18)	.030 (0,76)	—	.005 (0,13)	—	.156 (3,96)	.031 (0,79)	.156 (3,96)
<b>MAXIMUM PRETRAVEL (IN/MM)</b>	GF	—	—	—	—	.020 (0,51)	—	—	—	—
	KA	.312 (7,92)	.020 (0,51)	0.8 (2,0)	.015 (0,38)	.015 (0,38)	.015 (0,38)	.38 (9,7)	.09 (2,3)	.38 (9,7)
	KC	—	.020 (0,51)	0.8 (2,0)	.020 (0,51)	.020 (0,51)	.020 (0,51)	—	.09 (2,3)	—
	KG	.312 (7,92)	—	—	—	.025 (0,64)	—	.38 (9,7)	—	.38 (9,7)
	KH	.38 (9,7)	.025 (0,64)	0.9 (2,3)	.025 (0,64)	.025 (0,64)	.025 (0,64)	.38 (9,7)	0.9 (2,3)	.38 (9,7)
	PB	.38 (9,7)	.030 (0,76)	0.9 (2,3)	.030 (0,76)	.030 (0,76)	.030 (0,76)	.38 (9,7)	0.9 (2,3)	.38 (9,7)
<b>MINIMUM OVERTRAVEL (IN/MM)</b>	GF	—	—	—	—	.005 (0,13)	—	—	—	—
	KA	.156 (3,96)	.055 (1,40)	.06 (1,5)	.22 (5,6)	.005 (0,13)	.141 (3,58)	.19 (4,8)	.06 (1,5)	.19 (4,8)
	KC	—	.055 (1,40)	0.9 (2,3)	.22 (5,6)	.005 (0,13)	.141 (3,58)	—	0.9 (2,3)	—
	KG	.156 (3,96)	—	—	—	.005 (0,13)	—	.19 (4,8)	—	.19 (4,8)
	KH	.156 (3,96)	.055 (1,40)	0.9 (2,3)	.22 (5,6)	.005 (0,13)	.141 (3,58)	.19 (4,8)	0.9 (2,3)	.19 (4,8)
	PB	.156 (3,96)	.055 (1,40)	0.9 (2,3)	.22 (5,6)	.005 (0,13)	.141 (3,58)	.19 (4,8)	0.9 (2,3)	.19 (4,8)



*Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change*

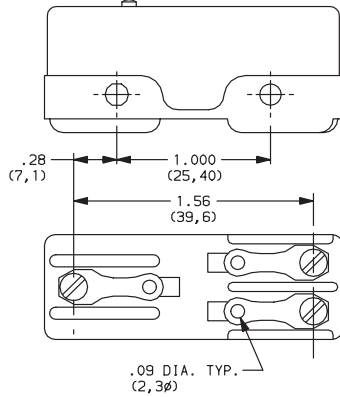


**Snap-acting**

# HB Series Single Pole Standard Precision Snap-acting Switches

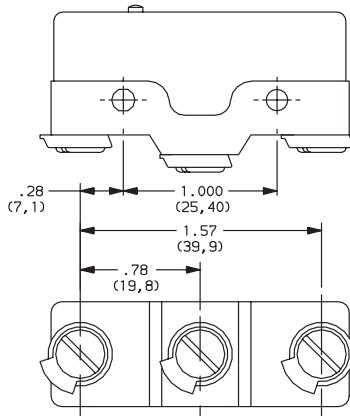
## TERMINATIONS

### 11 FLAT BASE, SOLDER TERMINALS AND 4-40 SCREWS



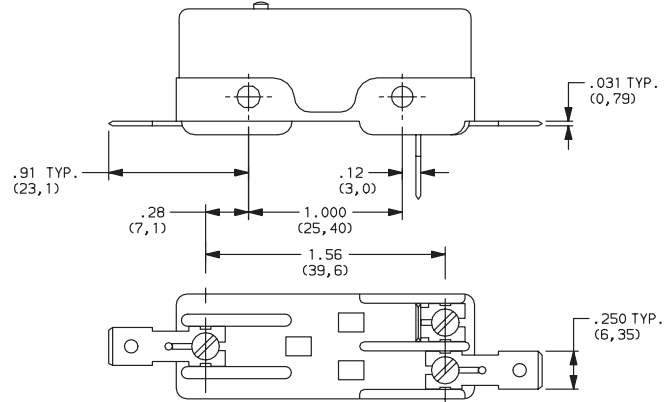
**NOTE:** Switches with flat base option have molded ribs that provide increased creep distance.

### 55 STEP BASE, 6-32 SCREWS AND CUP WASHERS



**NOTE:** Switches with step base option provide wide electrical clearance for screw terminal options.

### 41 FLAT BASE, .250" QUICK CONNECT TERMINALS



## CIRCUITRY

### C DT (Double Throw, Normally Closed & Normally Open)

Snap-acting



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# A Series General Purpose Snap-acting Switches

## Features/Benefits

- Low cost—high performance
- Long electrical life
- Single and double pole
- Sealed actuator option available

## Typical Applications

- Enclosure equipment
- Garage door openers
- Vending machines



## Specifications

CONTACT RATING: From low level\* to 30 AMPS @ 277 V AC.  
 ELECTRICAL LIFE: 75,000 cycles at 25 AMPS @ 250 V AC,  
 200,000 cycles at 15 AMPS @ 250 V AC.  
 INSULATION RESISTANCE: 1,000 M ohm min.  
 DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -67°F to 185°F (-55°C to 85°C).  
 OPERATING FORCE: 20 oz. (567 grams) max. SP models.  
 40 oz. (1134 grams) max. DP models at actuator button.  
 MOUNTING: Torque screws 3 in/lbs max.  
 MOUNTING NUT: 20 in/lbs max. torque

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

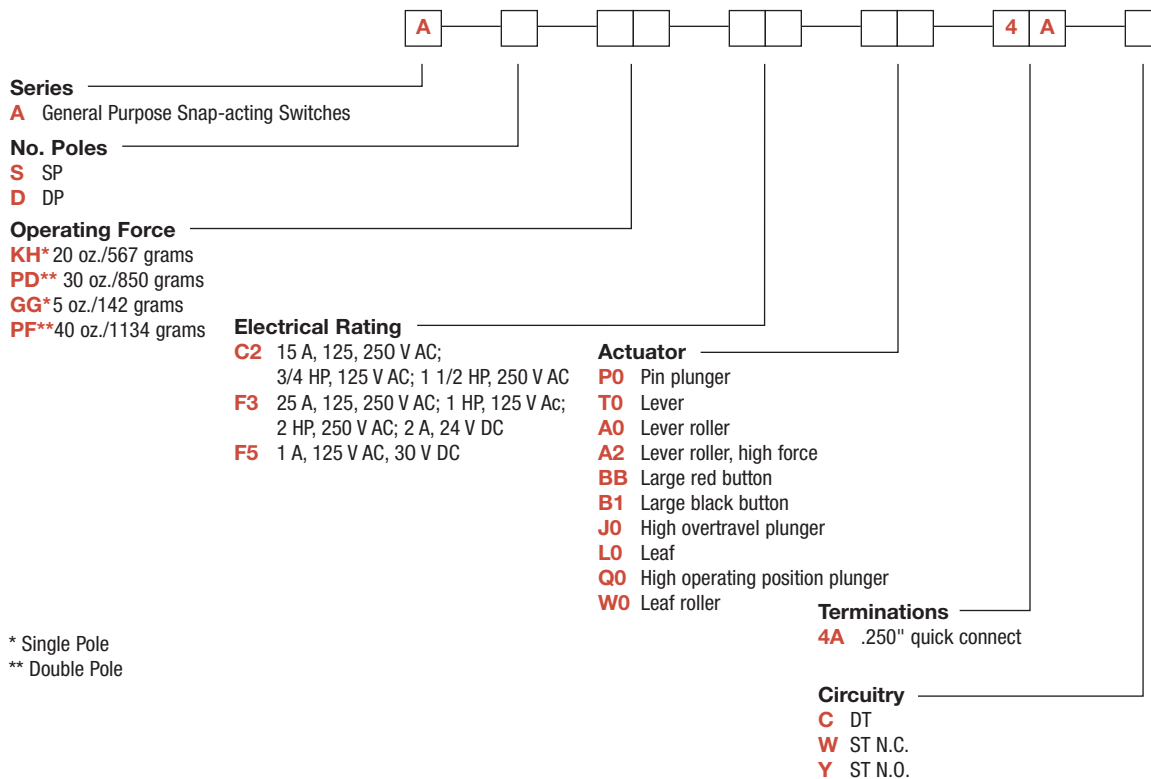
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

SWITCH HOUSING: Heat resistant phenolic (UL 94V-0).  
 ACTUATOR BUTTON: Heat resistant phenolic (UL 94V-0).  
 SPRING: Copper alloy.  
 PIVOT: Brass alloy for models up to 15 AMPS.  
 Copper for 25 AMP models.  
 MOVABLE CONTACTS: Gold alloy for ratings 1 AMP or less.  
 Fine silver for ratings up to 15 AMPS. Silver alloy for ratings of 30.1 AMPS.  
 STATIONARY CONTACTS: Gold alloy on brass base alloy for ratings 1 AMP or less. Fine silver welded on brass base alloy for ratings greater than 1 AMP up to 15 AMPS. Fine silver welded on copper alloy for ratings 30.1 AMPS.  
 TERMINALS: Brass alloy for 1 AMP up to 15 AMPS.  
 Copper alloy for 30.1 AMPS.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-78 through J-81. For additional options not shown in catalog, consult Customer Service Center.



Snap-acting



Dimensions are shown: Inch (mm)  
 Specifications and dimensions subject to change

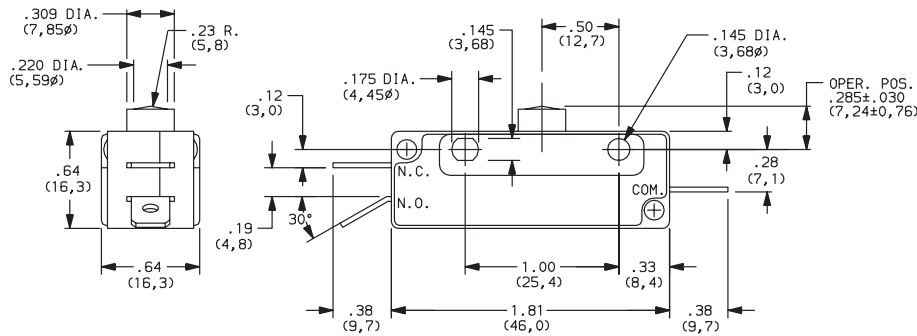
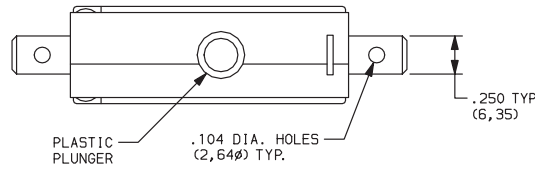
# A Series General Purpose Snap-acting Switches

SERIES ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

**A** GENERAL PURPOSE SNAP-ACTING SWITCHES

NO. POLES ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

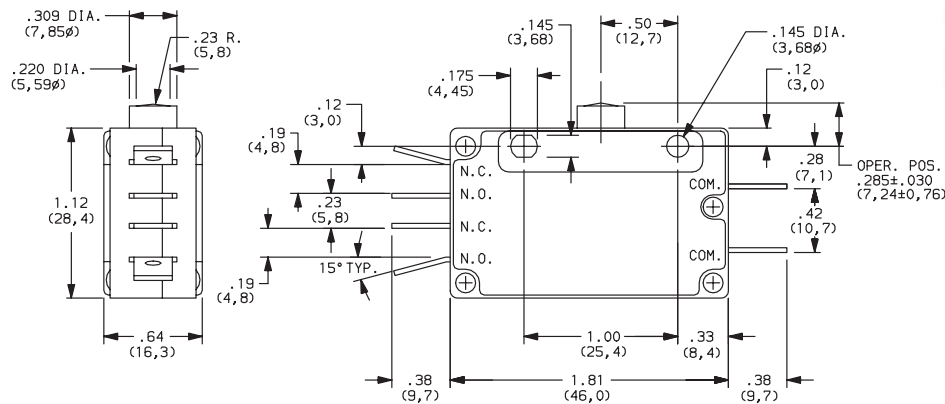
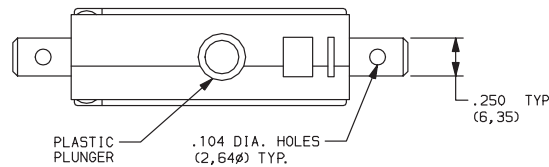
**S** SINGLE POLE SWITCH



Mounting holes will accept pins or screws of .139 dia. (3,53) max., on 1.000 (25,40) centers.

Snap-acting

**D** DOUBLE POLE SWITCH



Mounting holes will accept pins or screws of .139 dia. (3,53) max., on 1.000 (25,40) centers.

**NOTE:** To select switching function, see CIRCUITRY section, page J-81.



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# A Series General Purpose Snap-acting Switches

## OPERATING FORCE

OPTION CODE	NO. POLES	BASIC SWITCH OPERATING FORCE (OZ./GRAMS)
<b>KH</b>	SP	20 567
<b>PD</b>	DP	30 850
<b>GG</b>	SP	5 142
<b>PF</b>	DP	40 1134

**NOTE:** Operating force varies with actuator, see ACTUATOR option section.

## ELECTRICAL RATING

OPTION CODE	CONTACT MATERIAL		ELECTRICAL RATING
	MOVABLE CONTACT	STATIONARY CONTACT	
<b>C2</b>	Fine silver.	Fine silver welded on brass base alloy.	15 AMPS @ 125 & 250 V AC; 3/4 HP @ 125 V AC; 1-1/2 HP @ 250 V AC.
<b>F3</b>	Silver alloy.	Silver welded on copper base alloy.	25 AMPS @ 125 & 250 V AC; 1 HP @ 125 V AC; 2 HP @ 250 V AC; 2 AMPS @ 24 V DC.
<b>F5</b>	Gold alloy.	Gold alloy on brass base alloy.	From low level* to 1 AMP @ 125 V AC, 30 V DC.

All models  with all options.

Contact Customer Service Center for availability and delivery of nonstandard ratings.

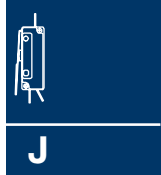
\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

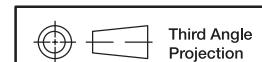
### AVAILABLE COMBINATIONS

ELECTRICAL RATING	OPERATING FORCE (OZ./GRAMS)			
	GG 5 142	KH 20 567	PD 30 850	PF 40 1134
C2	•	•	•	•
F3	X	•	•	•
F5	•	•	•	•

• AVAILABLE  
X NOT AVAILABLE



Snap-acting



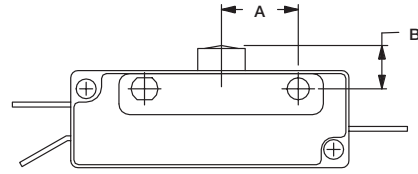
Dimensions are shown: Inch (mm)

Specifications and dimensions subject to change

# A Series General Purpose Snap-acting Switches

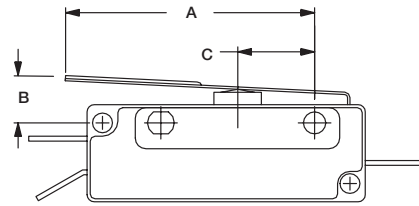
## ACTUATOR

OPTION CODE	FIG.	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F
<b>P0</b>	1	.50 (12,7)	.285 ± .030 (7,24 ± 0,76)	—	—	—	—
<b>A0</b>	3	1.38 (35,1)	.718 ± .062 (18,24 ± 1,57)	.375 dia. (9,530)	.50 (12,7)	.50 (12,7)	—
<b>A2</b>	4	1.25 (31,8)	.718 ± .062 (18,24 ± 1,57)	.375 dia. (9,530)	.50 (12,7)	—	—
<b>B1</b>	6	1.50 (38,1)	.40 ± 0.1 (10,2 ± 2.54)	.98 dia. (24,90)	—	—	—
<b>BB</b>	6	1.50 (38,1)	.40 ± 0.1 (10,2 ± 2.54)	.98 dia. (24,90)	—	—	—
<b>J0</b>	5	.50 (12,7)	.810 ± .030 (20,6 ± 0,8)	.38 (9,7)	.25 dia. (6,40)	—	—
<b>L0</b>	2	1.62 (41,1)	.312 ± .062 (17,92 ± 1,57)	.50 (12,7)	—	—	—
<b>Q0</b>	5	.50 (12,7)	.670 ± .030 (17,02 ± 0,76)	.38 (9,6)	.25 dia. (6,40)	—	—
<b>T0</b>	7	1.50 (38,1)	.318 ± .062 (8,08 ± 1,57)	.50 (12,7)	.50 (12,7)	—	—
<b>W0</b>	8	1.50 (38,1)	.801 ± .062 (20,34 ± 1,57)	.375 dia. (9,530)	.50 (12,7)	—	—

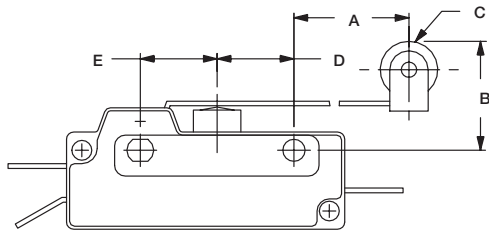


**FIG. 1**  
High Overtravel Plunger

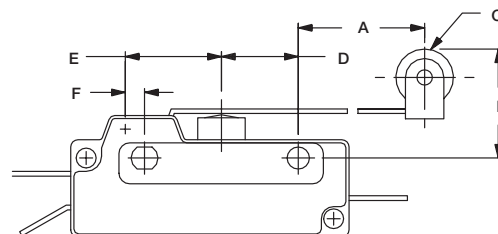
**NOTE:** The "H0" high overtravel plunger option provides .100 (2,54) min. overtravel and longer mechanical life (1,000,000 operations typical).



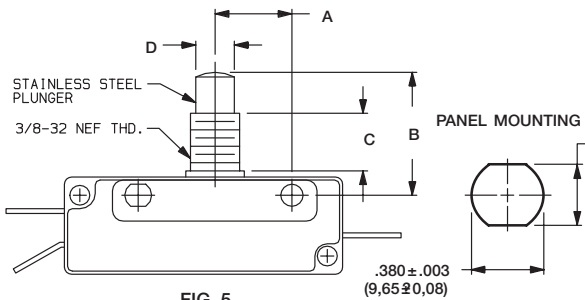
**FIG. 2**  
Leaf



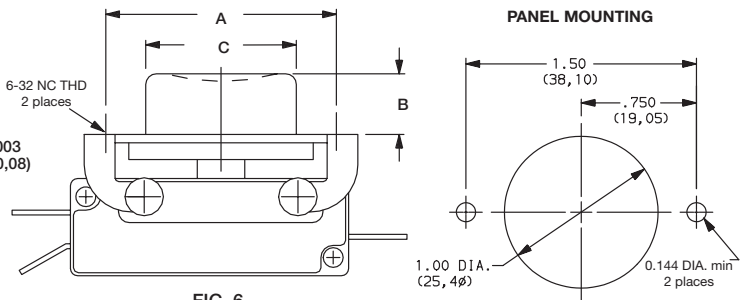
**FIG. 3**  
Lever Roller



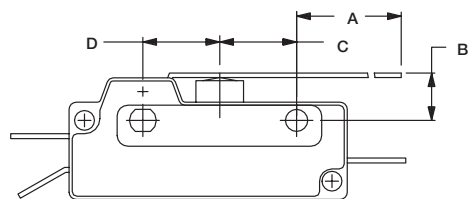
**FIG. 4**  
Lever roller (High Force)



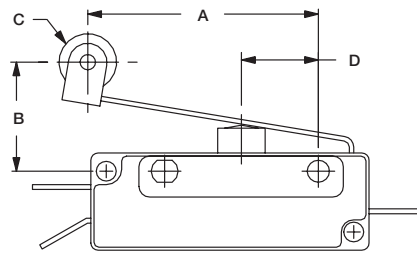
**FIG. 5**  
High Overtravel Plunger  
Torque 20 in/lbs max. (Nut)



**FIG. 6**  
B1 - Black Button  
BB - Red Button

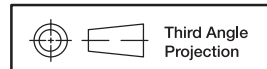


**FIG. 7**  
Lever



**FIG. 8**  
Leaf Roller

Snap-acting



Dimensions are shown in inches (mm)  
Specifications and dimensions subject to change



# A Series General Purpose Snap-acting Switches

## ACTUATOR

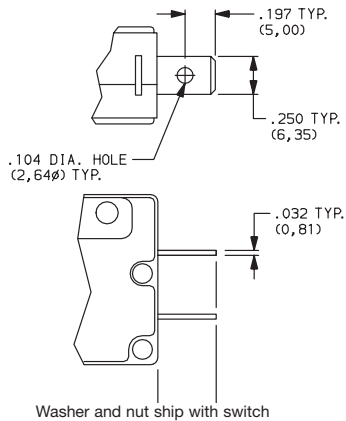
### SWITCH CHARACTERISTICS

OPTION CODE	MAXIMUM OPERATING FORCE (OZ./GRAMS)				MINIMUM RELEASE FORCE (OZ./GRAMS)				MAXIMUM PRETRAVEL				MINIMUM OVERTRAVEL				OPERATING POSITION			
	GG S.P.	KH S.P.	PD D.P.	PF D.P.	GG S.P.	KH S.P.	PD D.P.	PF D.P.	GG S.P.	KH S.P.	PD D.P.	PF D.P.	GG S.P.	KH S.P.	PD D.P.	PF D.P.	GG S.P.	KH S.P.	PD D.P.	PF D.P.
A0	1.5 42.5	4 113	6 170	10 283	0.3 8.5	0.5 14	1 28		.312 (7,92)				312 (7,92)	.187 (4,75)			.718 (18,24)			
A2	1.5 42.5	4 113	6 170	10 283	0.4 11	0.5 14	1 28		.25 (6,4)				.14 (5,6)				.718 (18,24)			
B1	8 227	20 567	30 850	40 1134	1 28	3 85	6 170		.050 (1,27)				.050 (1,27)				—			
BB	8 227	20 567	30 850	40 1134	1 28	3 85	6 170		.050 (1,27)				.050 (1,27)				—			
J0	5 142	20 567	30 850	40 1134	1 28	3 85	6 170		.050 (1,27)				.187 (4,75)				—			
L0	3 85	12 340	18 510	22 624	0.5 14	1 28	2 56.7		.281 (7,14)				.062 (1,57)				.312 (7,92)			
P0	8 227	20 567	30 850	40 1134	1 28	3 85	6 170		.050 (1,27)				.050 (1,27)				—			
Q0	5 142	20 567	30 850	40 1134	1 28	3 85	6 170		.050 (1,27)				.050 (1,27)				—			
T0	1.5 42.5	4 113	6 170	10 283	0.3 8.5	0.5 14	1 28		.312 (7,92)				.187 (4,75)				312 (7,92)			
W0	3 85	12 340	18 510	22 624	0.5 14	1 28	2 56.7		.281 (7,14)				.062 (1,57)				.718 (18,24)			

NOTE: For basic switch operating forces, see page J-77.

## TERMINATIONS

### 4A .250" QUICK CONNECT



NOTE: Terminals can be supplied at various angles. Other terminal styles can be supplied for special applications. Consult Customer Service Center for special requirements.

## CIRCUITRY

- C** DT (Double Throw, Normally Open & Normally Closed)
- W** ST N.C. (Single Throw, Normally Closed)
- Y** ST N.O. (Single Throw, Normally Open)

NOTE: To select number of poles, see NO. POLES section, page J-56



Third Angle  
Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**



Snap-acting

# TL Series Door Interlock Switches



## Features/Benefits

- Push/pull motion
- Multiple mounting configurations
- Wide variety of termination options
- Ratings up to 15 AMPS

## Typical Applications

- Computer enclosures
- Panel builders
- Industrial enclosures

## Specifications

CONTACT RATING: 15 AMPS @ 125 & 250 V AC; 0.25 AMP @ 250 V DC; 0.5 AMP @ 125 V DC; 1/2 HP @ 125 & 250 V AC; 3 AMPS @ 125 V AC "L".

ELECTRICAL LIFE: 150,000 cycles at 15 AMPS @ 250 V AC.

INSULATION RESISTANCE: 1,000 M ohm min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -67°F to 302°F (-55°C to 150°C).

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

SWITCH HOUSING: Thermoplastic or general purpose phenolic (UL 94V-0).

MOUNTING BRACKET: Stainless steel.

PLUNGER: Stainless steel.

ACTUATOR BUTTON: Thermoplastic (UL 94V-0).

SPRING: Copper alloy.

PIVOT: Brass alloy.

MOVABLE CONTACT: Fine silver.

STATIONARY CONTACTS: Fine silver.

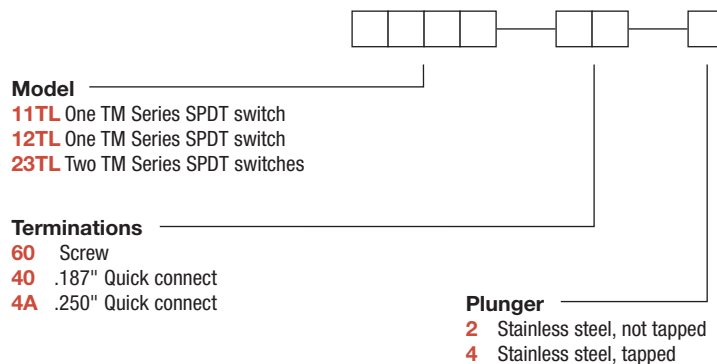
TERMINALS: Copper alloy.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-83 and J-84. For additional options not shown in catalog, consult Customer Service Center.

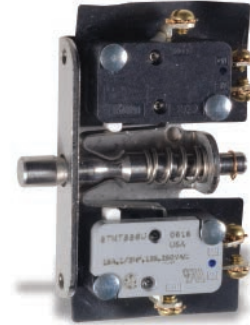
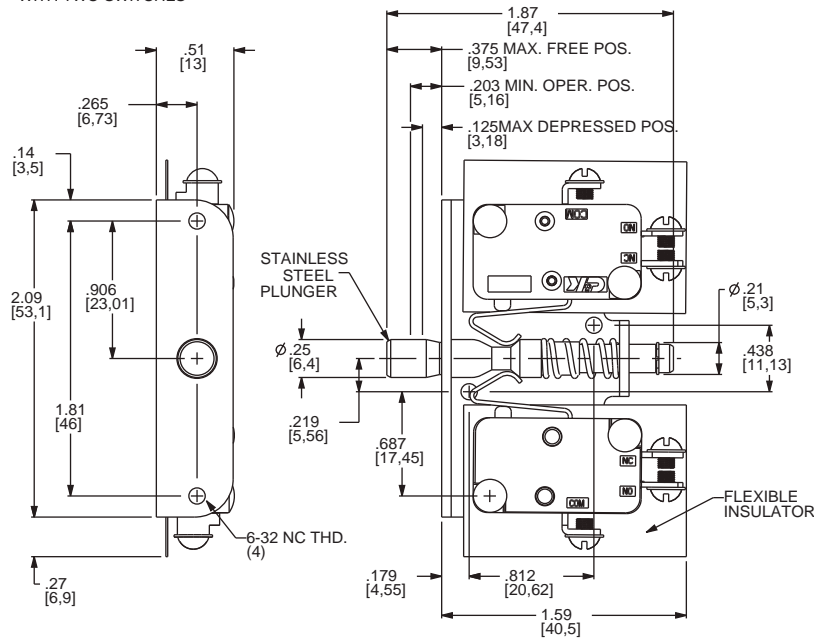




# TL Series Door Interlock Switches

MODEL

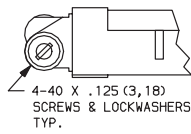
**23TL** WITH TWO SWITCHES



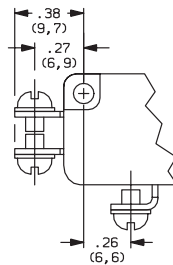
23TL602  
SPDT

TERMINATIONS

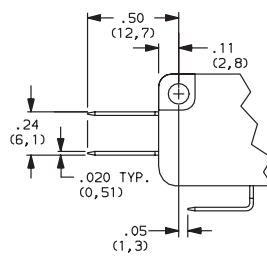
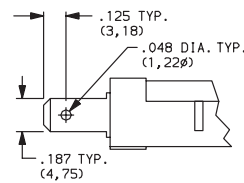
**60** SCREW TERMINALS



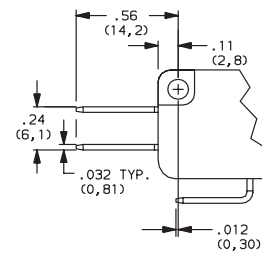
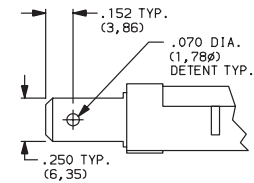
Torque screws to 6in lbs max



**40** .187" QUICK CONNECT



**4A** .250" QUICK CONNECT



PLUNGERS

**2** STAINLESS STEEL, NOT TAPPED

**4** STAINLESS STEEL, TAPPED 4-40 x .375 (9,52) min. depth

Snap-acting



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# DS Series Interlock Pushbutton Switches

## Features/Benefits

- Snap-in mounting
- Reliable snap action mechanism
- Latch or momentary
- RoHS compliant
- Halogen free material

## Typical Applications

- Interlock switch
- Detection switch
- Circuit interrupt



## Specifications

FUNCTION: Single pole double throw / Double pole double throw  
MOUNTING TYPE: Snap in style

## Electrical

ELECTRICAL LIFE: see ratings chart below  
DIELECTRIC STRENGTH: 1500 V (50-60 Hz @ sea level)  
INSULATION RESISTANCE: 100 M  $\Omega$  min.  
INITIAL CONTACT RESISTANCE: 30 milli-ohms

## Materials

HOUSING, COVER, ACTUATOR, KNOB: PA 66/6 halogen free, UL94V-0  
NO & NC FIXED TERMINALS: Copper alloy  
COMMON TERMINALS: Copper alloy, silver plate  
CONTACTS: Silver alloy / F5 rating gold plated over silver alloy  
RETURN SPRINGS: Stainless steel

## Operating Environment

OPERATING TEMPERATURE: -40°C to +85°C

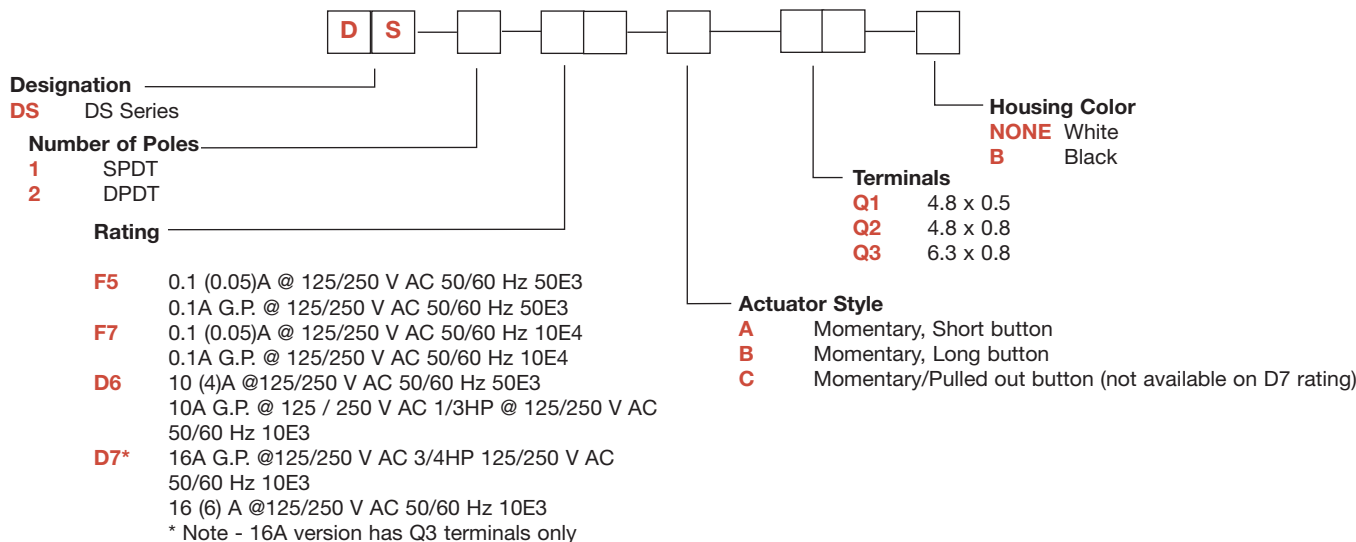
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, please contact Customer Service.



Snap-acting

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.



## International Rating Symbols

10E3	Cycles 10,000
10E4	Cycles 100,000
50E3	Cycles 50,000
10(4)	Current rating: First number represents resistive rating. Second number represents inductive (motor) rating
GP	General purpose rating UL1054

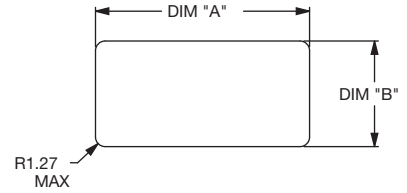
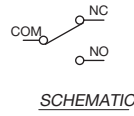
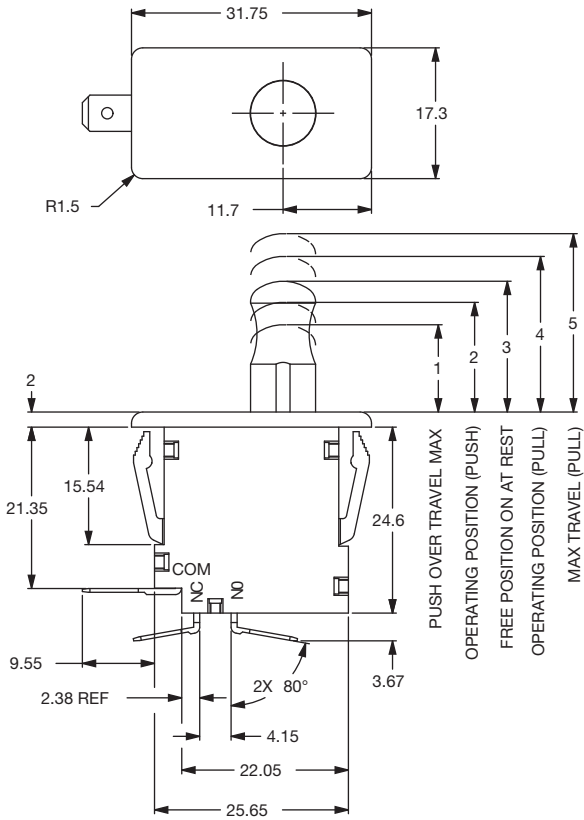


Dimensions are shown: mm  
Specifications and dimensions subject to change

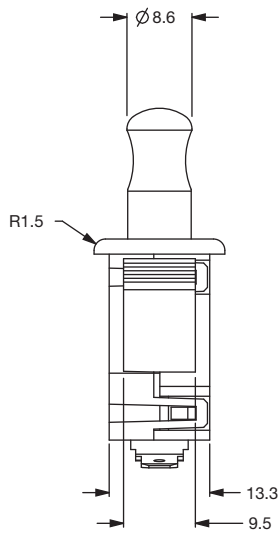
# DS Series Interlock Pushbutton Switches

## NUMBER OF POLES

### 1 SPDT

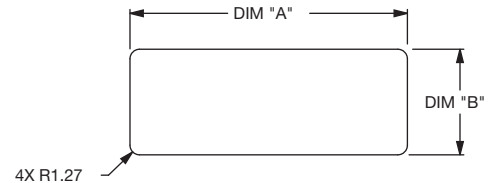
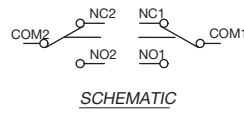
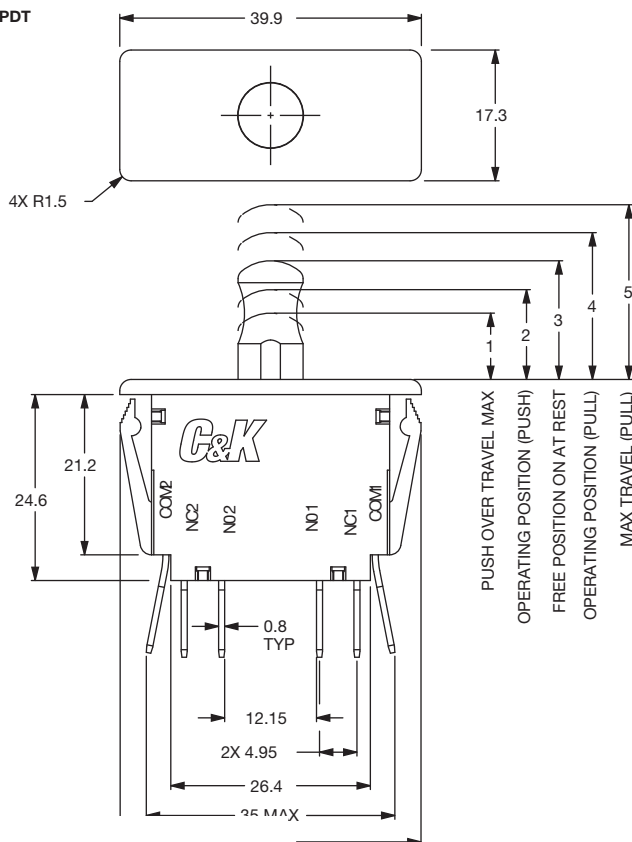


PANEL MOUNTING		
PANEL THICKNESS	DIM "A" mm	DIM "B" mm
1.14	28.32	13.97
2.54	28.58	13.97

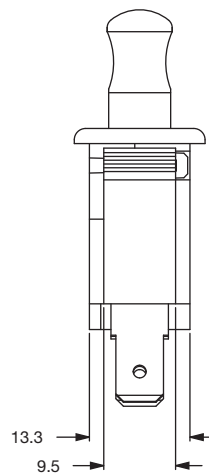


Snap-acting

### 2 DPDT



PANEL MOUNTING		
PANEL THICKNESS	DIM "A" mm	DIM "B" mm
1.14	36.70	13.97
2.54	36.96	13.97

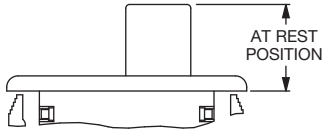


Dimensions are shown: mm  
Specifications and dimensions subject to change

# DS Series Interlock Pushbutton Switches

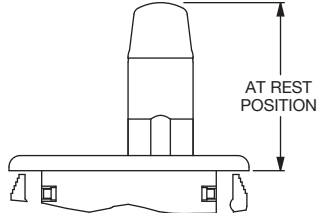
## ACTUATOR STYLE / SPECIFICATIONS

**A** SHORT BUTTON



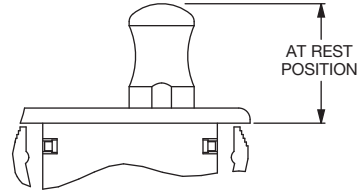
SHORT BUTTON

**B** LONG BUTTON

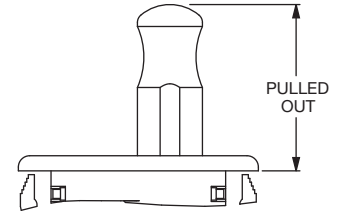


LONG BUTTON

**C** MOMENTARY/PULLED OUT



FREE POSITION



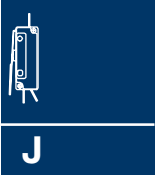
PULLED OUT POSITION

### SPDT Specification

BUTTON STYLE	OVER TRAVEL POSITION PUSH MAX	OVER TRAVEL POSITION PULL MAX	OPERATING POSITION PUSH	OPERATING POSITION PULL	FREE POSITION AT REST	OPERATING FORCE	
A	3.20	NA	8.90 ± 1.25	NA	11.45 ± 0.75	425 gf	
B	10.15	NA	19.55 ± 1.25	NA	22.25 ± 0.75	425 gf	
C	13.20	24.90	16.75 ± 1.25	21.60 ± 1.25	19.30 ± 0.75	PUSH 385gf	PULL 475gf

### DPDT Specification

BUTTON STYLE	OVER TRAVEL POSITION PUSH MAX	OVER TRAVEL POSITION PULL MAX	OPERATING POSITION PUSH	OPERATING POSITION PULL	FREE POSITION AT REST	OPERATING FORCE	
A	3.20	NA	8.90 ± 1.25	NA	11.45 ± 0.75	680 gf	
B	10.15	NA	19.55 ± 1.25	NA	22.25 ± 0.75	680gf	
C	13.20	24.90	16.75 ± 1.25	21.60 ± 1.25	19.30 ± 0.75	PUSH 560gf	PULL 750gf

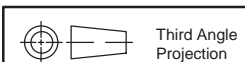
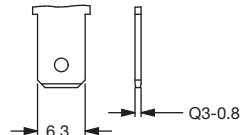
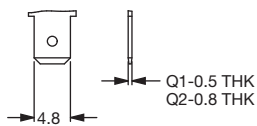


Snap-acting

## TERMINALS

**Q1** 4.8 x 0.5  
**Q2** 4.8 x 0.8

**Q3** 6.3 x 0.8



Third Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

# Tactile Switches




## Product Selection Guide







<b>Surface Mount</b>							
<b>Series</b>	<b>KXT</b>	<b>KMT2</b>	<b>KMT0</b>	<b>KMR2-4</b>	<b>KMS</b>	<b>PTS525</b>	<b>PTS530</b>
<b>Size on PCB L x W (mm)</b>	2 x 3	3 x 2,6	3 x 2,6	4,2 x 2,8	4,2 x 3,55	5,2 x 5,2	4,5 x 4,5
<b>Total Height (mm)</b>	0,58	0,65	0,65	1,9 2,5	1,42	0,8 and 1,5	0,55 and 0,65
<b>Travel (mm)</b>	0,13	0,15	0,15	0,2 to 0,35	0,25 to 0,3	0,3	0,2
<b>Actuation Force (N)</b>	100 gf 180gf 240 gf	1,0 1,6	1,0; 1,6 2,3; 3,4	1,2; 2,0 3,0; 4,0	2,0 3,0	1,6 2,6	1,0; 1,6; 2,0; 2,6; 4,0; 6,0
<b>Contact Type</b>	Silver	Silver	Silver	Silver / Gold	Silver / Gold	Silver	Silver
<b>Max. Voltage (V)</b>	12	32	32	32	32	32	12
<b>Max. Switching Power (VA)</b>	0,5	0,5	0,5	1 / 0,2	1 / 0,2	1	-
<b>Life Cycles</b>	300,000	150,000	300,000/600,000 1,000,000	100,000 300,000	100,000	100,000	150,000 to 1,000,000
<b>IP Rating</b>	IP64	IP54	IP68	IP40	IP40	IP40	-
<b>Page Number</b>	B-5	B-7	B-9	B-11/B-13	B-15	B-17	B-21
<b>Surface Mount</b>							
<b>Series</b>	<b>PTS540</b>	<b>PTS810</b>	<b>PTS820</b>	<b>PTS840</b>	<b>KSR</b>	<b>KSS</b>	<b>KSC4V2</b>
<b>Size on PCB L x W (mm)</b>	3,7 x 3,7	4,2 x 3,2	3,9 x 2,9	3,5 x 3,55	7,15 x 3,8 7,3 x 3,8	5,5 x 4,4	2 holes ø 1,1 2 pads 1,5 x 0,8
<b>Total Height (mm)</b>	0,55 / 0,65	2,5	1,5/2,0/2,5	1,35	2,5	1,7	5,0*
<b>Travel (mm)</b>	0,15	0,15/0,2	0,2	0,2	0,3 to 0,5	0,3	0,7*
<b>Actuation Force (N)</b>	160 gf 230 gf	1,6; 2,6; 4,0; 6,0	1,6 2,5	1,6 2,2	1,2; 2,0; 3,0; 4,5	2 2,5 4	3.5*
<b>Contact Type</b>	Silver	Silver	Silver	Silver	Silver / Gold	Silver / Gold	Silver / Gold
<b>Max. Voltage (V)</b>	12	16	12	12	32	32	32
<b>Max. Switching Power (VA)</b>	-	-	-	-	1 / 0,2	1 / 0,2	1 / 0,2
<b>Life Cycles</b>	300,000 500,000	50,000 to 150,000	100,000 200,000	100,000	100,000 200,000	100,000	300,000
<b>IP Rating</b>	IP40	IP40	IP40	IP40	IP50	IP40	IP67
<b>Page Number</b>	B-23	B-25	B-27	B-30	B-33	B-37	B-51

\* Other options available by request

*Dimensions are shown: mm  
Specifications and dimensions subject to change*

# Tactile Switches Product Selection Guide

<b>SMT, Thru-hole Sealed High Performance</b>							
<b>Series</b>	<b>KSC 1 - 10</b>		<b>KSE</b>	<b>KT</b>	<b>K5AT</b>	<b>K8</b>	
<b>Footprint</b>	J 6,8 x 6,2	G 10 x 6,2	6,8 x 6,2	SA 7,5x5	SA2 7,5x7	G 8,4 x 10,8	G 8,4 x 10,8
<b>Total Height (mm)</b>			3,1 / 4,3	6,6 7,11 with tab	6,1	6	
<b>Travel (mm)</b>	0,20 to 0,75 *		0,3	0,3 to 0,5	0,5	0,45	
<b>Actuation Force (N)</b>	1,1 to 5,5 *		1.5 2.25	3	4	2.5 4.0	
<b>Contact Type</b>	Silver / Gold		Silver	Silver / Gold	Gold	Silver / Gold	
<b>Max. Voltage (V)</b>	32		32	50	32	32	
<b>Max. Switching Power (VA)</b>	1 / 0.2		1	1 / 0.2	1	1 / 0.2	
<b>Life Cycles</b>	100,000 to 1,000,000		300,000	100,000	25,000	300,000	
<b>IP Rating</b>	IP67		IP67		IP40	IP40	
<b>Page Number</b>	B-39		B-53	B-56	B-61	B-63	

<b>Thru-hole</b>							
<b>Series</b>	<b>K5V</b>	<b>KSF/KSI</b>	<b>KSA</b>	<b>KSA MKII</b>	<b>KSA-V</b>	<b>KSL</b>	<b>KSL-V</b>
<b>Footprint</b>	8 x 9 x 17 / 9 x 13	7,62 x 5,08	7,62 x 5,08	7,62 x 5,08	7,62 x 2,54	7,62 x 5,08	7,62 x 2,54
<b>Total Height (mm)</b>	9 / 13	2,6	4,7 button option	4,7	8	9,9	8
<b>Travel (mm)</b>	1,2	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5
<b>Actuation Force (N)</b>	4.0	1.3 3.0    1.6 5.0	1.3 3.0 5.0	1.3 3.0 5.0	1.3 3.0 5.0	1,3 3,0	1,3 3,0
<b>Contact Type</b>	Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold
<b>Max. Voltage (V)</b>	32	32	32	32	32	32	32
<b>Max. Switching Power (VA)</b>	1	1 / 0.2	1 / 0.2	1 / 0.2	1 / 0.2	1 / 0.2	1 / 0.2
<b>Life Cycles</b>	25,000	100,000	100,000	100,000 1,000,000	100,000	100,000	100,000
<b>IP Rating</b>	IP40	IP60	IP60	IP67	IP60	IP60	IP60
<b>Page Number</b>	B-66	B-70	B-72	B-77	B-72	B-72	B-72

\* Other options available by request

# Tactile Switches

## Product Selection Guide

Thru-hole						
Series	KSJ	KSJ-V	PTS635	PTS635-V	PTS641	PTS645
Footprint	7,62 x 5,08	7,62 x 2,54	6 x 3,5	7,0 x 2,5	6,3 x 6,4	6 x 6
Total Height (mm)	6,65	8	2,5 4,3 5,0	4,3	2,5 3,1 3,4	4,3; 5,0; 7,0; 9,5;
Travel (mm)	0,55 to 0,7	0,55 to 0,7	0,25	0,25	0,20 / 0,30	0,25
Actuation Force (N)	2,0 3,0	2,0 3,0	1,3 2,0 2,6	1,3 2,0	160 gf 250 gf 320 gf	1,3; 1,6 2,0; 2,6
Contact Type	Silver Gold	Silver Gold	Silver	Silver	Silver	Silver
Max. Voltage (V)	32 32	32 32	12	12	12	12
Life Cycles	100,000 30,000	100,000 30,000	20,000	20,000	100,000	100,000
IP Rating	IP60	IP60	IP40	IP40	IP40	IP40
Page Number	B-79	B-79	B-81	B-81	B-84	B-86

Thru-hole						
Series	PTS645-V	PTS125	ITS	KSH		
Footprint	7,0 x 2,5	12 x 12	variety of sizes available	6,3 x 6,3		
Total Height (mm)	7,1	4,3 7,3 Sq. 8,5 12,0		5,0		
Travel (mm)	0,25	0,30	0,25	1,3		
Actuation Force (N)	1,3; 1,6 2,0; 2,6	1,6 2,6	160 gf	1,6; 2,0; 2,5 3,0; 3,5		
Contact Type	Silver	Silver	Silver	Silver		
Max. Voltage (V)	12	12	12	12		
Life Cycles	100,000	200,000	50,000	200,000		
IP Rating	IP40	IP40	IP40	IP40		
Page Number	B-91	B-93	B-97	B-105		

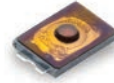
# KXT Series Ultra Low Profile Top Actuated

## Features

- 3.0 x 2.0 mm footprint
- 0.58 mm thickness
- High number of cycle

## Typical Applications

- Wearable electronics
- In-Ear headphones, Earbuds
- Mobile Phones
- Portable Electronics
- Hearing Aids



B

Tactile Switches

## Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 TERMINALS: G type for SMT  
 TRAVEL: 0.13 mm ± 0.05 mm

## Mechanical

	Operating force gf	Operating Life
KXT 111 LHS	100 ± 30	300,000
KXT 121 LHS	180 ± 50	300,000
KXT 131 LHS	240 ± 70	300,000

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 100 V AC (1mn)  
 CONTACT RESISTANCE: ≤ 500 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -30°C to 85°C  
 STORAGE TEMPERATURE: -40°C to 90°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

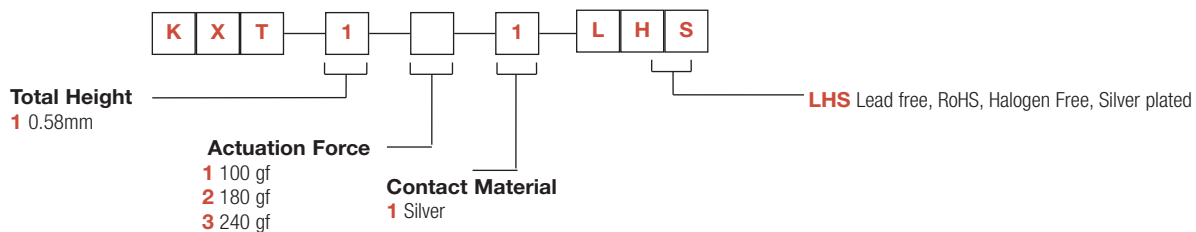
## Packaging

In reels of 17,000 pieces  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## Part Number Description

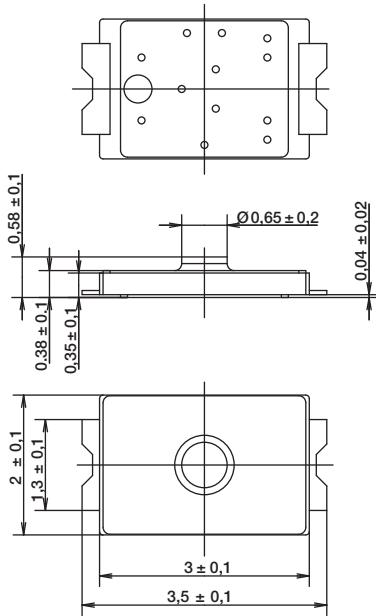
For any part number different from those listed above, please consult your local representative.



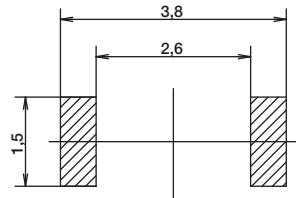
# KXT Series Ultra Low Profile Top Actuated

Tactile Switches

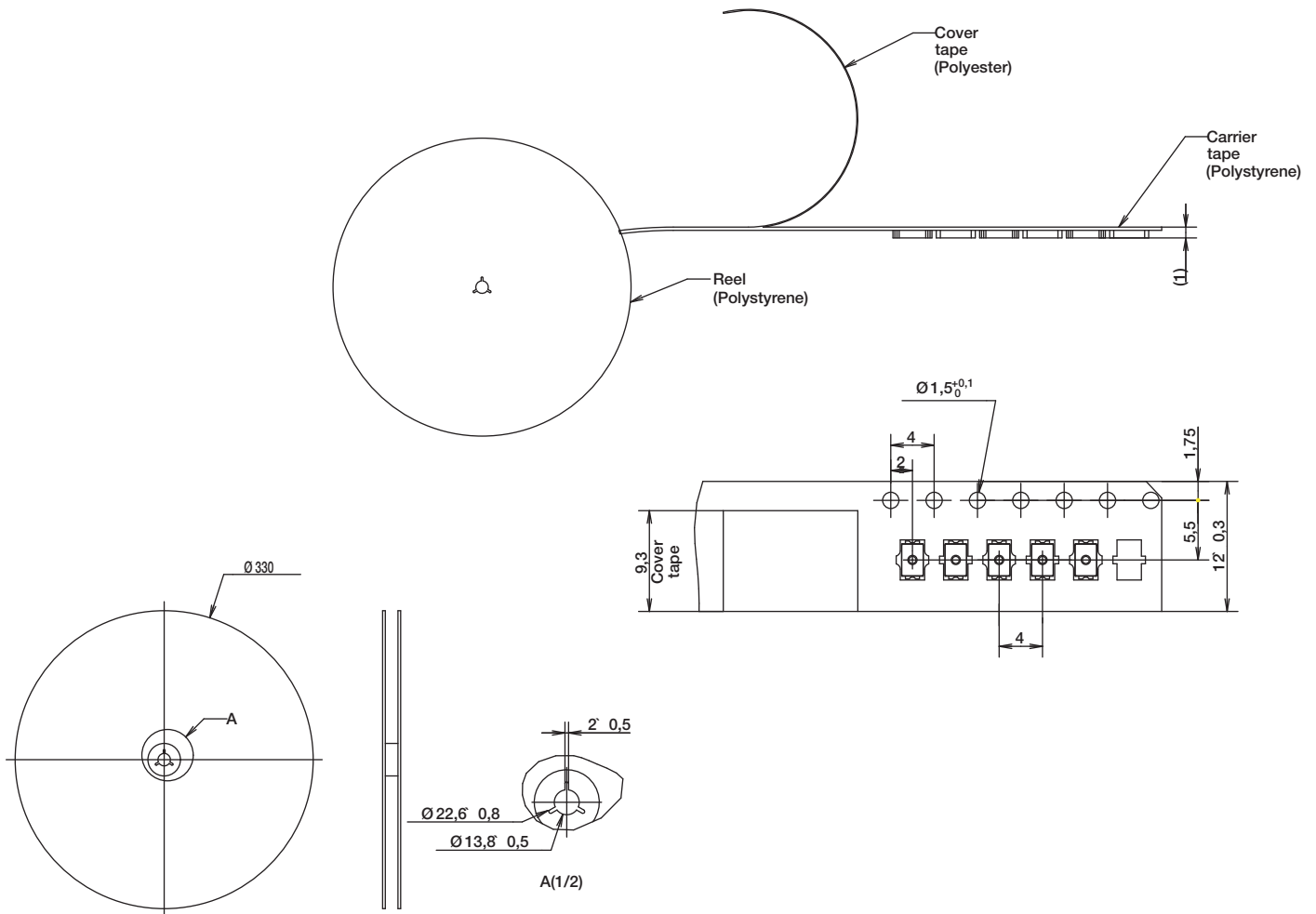
B



SCHEMATIC



RECOMMENDED PCB LAYOUT



Dimensions are shown: mm  
Specifications and dimensions subject to change



# KMT2 Series Nano-Miniature SMT Top Actuated

## Features

- **Smallest footprint**
- **High number of cycles within the smallest packaging**
- **Smallest thickness with integrated actuator**
- **Ground pin option**
- **Halogen free**

## Typical Applications

- **Mobile Phones**
- **Hearing Aids**
- **MP3 accessories**
- **Bluetooth Headset**



B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: Gullwing type for SMT

## Mechanical

Type G and NG	Operating force Newtons (grams)	Operating Life	Tactile Feeling	Travel mm
KMT 211 HF LFS	1.0 (100) ± 0.25	150,000	≥ 10%	0.15 ± 0.1
KMT 221 HF LFS	1.6 (160) ± 0.40	150,000	≥ 30%	0.15 ± 0.1

## Electrical

	Silver
MAXIMUM POWER:	0.5 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mV
MAXIMUM CURRENT DC:	50 mA
MINIMUM CURRENT DC:	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms (1mn)
CONTACT RESISTANCE:	≤ 150 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 6 ms

## Environmental

	Silver
OPERATING TEMPERATURE:	-40°C to 85°C
STORAGE TEMPERATURE:	-55°C (10 days) +85°C (4 days)

## Process

SOLDERING: This component is suited to the following methods:  
– Infrared Reflow Soldering in accordance with IEC61760-1

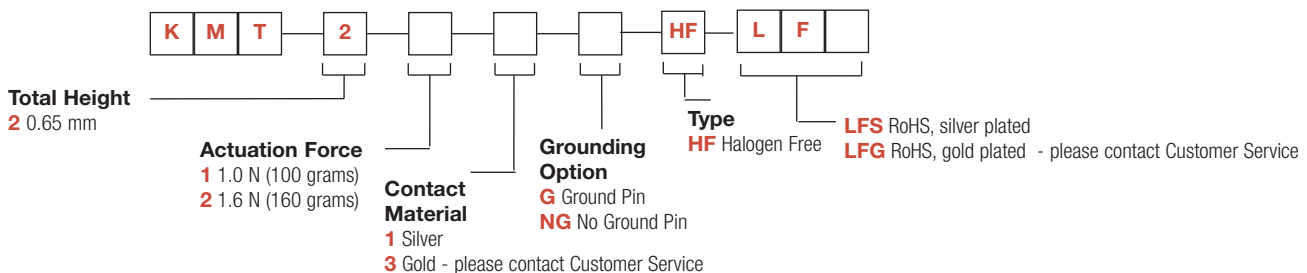
## Packaging

In reels of 4,000 pieces.  
Dimensions of reels according to EIA 481B  
External diameter 180 mm

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## Part Number Description

For any part number different from those listed above, please consult your local representative.

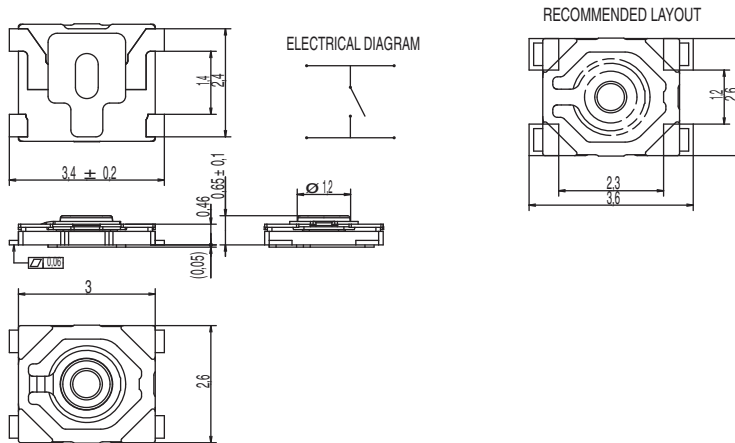


# KMT2 Series Nano-Miniature SMT Top Actuated

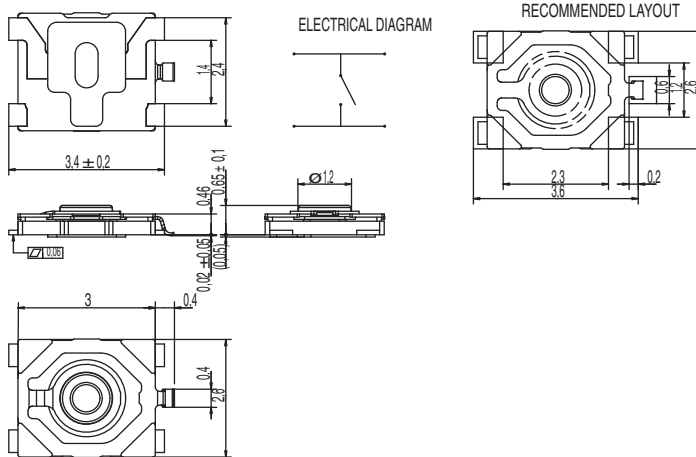
Tactile Switches

B

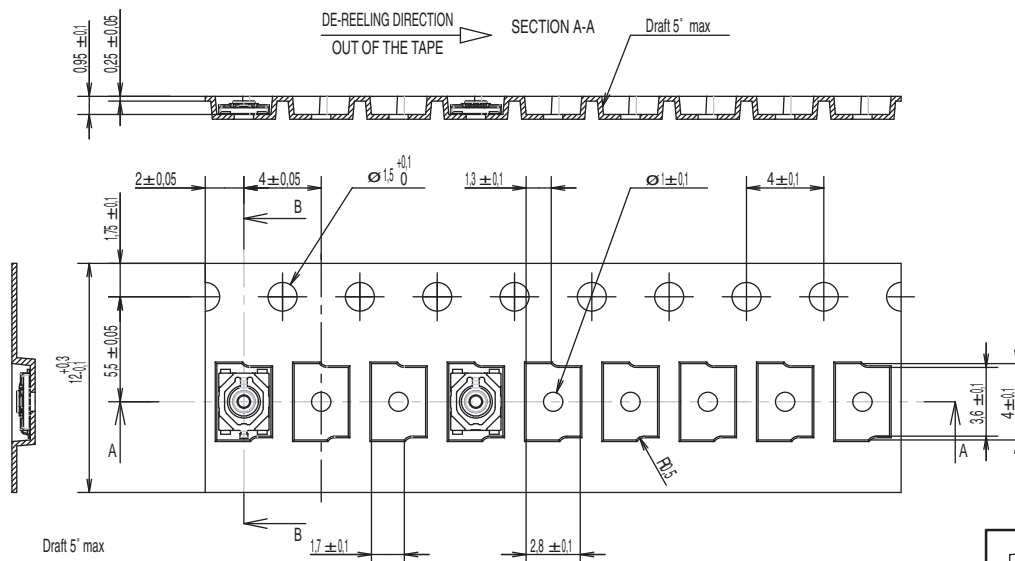
## KMT Series – No Ground Pin



## KMT Series – With Ground Pin



## TAPE & REEL



First Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change



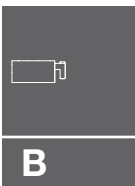
# KMT0 Series Nano-Miniature SMT Top Actuated

## Features

- **Smallest footprint**
- **Smallest thickness with integrated actuator**
- **Extended life cycles**
- **IP68**
- **Ultra low current capabilities**

## Typical Applications

- **Mobile Phones**
- **Hearing Aids**
- **MP3 accessories**
- **Bluetooth Headset**
- **Automotive keyless entry system**
- **Smoke and CO detectors**
- **E-readers**
- **Home automation remote controls**



Tactile Switches

## Specification

FUNCTION: momentary action, normally open  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: J lead type for SMT

## Mechanical

TRAVEL (mm): 0.15 ± 0.1

	Operating force Newtons (grams)	Tactile Feeling	Operating Life
KMT011NGJLHS	1.0 (100) ± 25%	≥ 10%	300,000
KMT021NGJLHS	1.6 (160) ± 25%	≥ 30%	300,000
KMT071NGJLHS	2.3 (230) ± 25%	≥ 30%	300,000
KMT031NGJLHS	3.4 (340) ± 25%	≥ 30%	300,000

	Operating force Newtons (grams)	Tactile Feeling	Operating Life
KMT012NGJLHS	1.0 (100) ± 25%	≥ 10%	1,000,000
KMT022NGJLHS	1.6 (160) ± 25%	≥ 30%	600,000
KMT072NGJLHS	2.3 (230) ± 25%	≥ 30%	600,000

## Electrical

MAXIMUM POWER:	0.5 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mV
MAXIMUM CURRENT DC:	50 mA
MINIMUM CURRENT DC:	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms (1mn)
CONTACT RESISTANCE:	≤ 150 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 6 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C  
STORAGE TEMPERATURE: -55°C (10 days) +85°C (4 days)

## Process

SOLDERING: This component is suited to the following methods:  
– Infrared Reflow Soldering in accordance with IEC61760-1

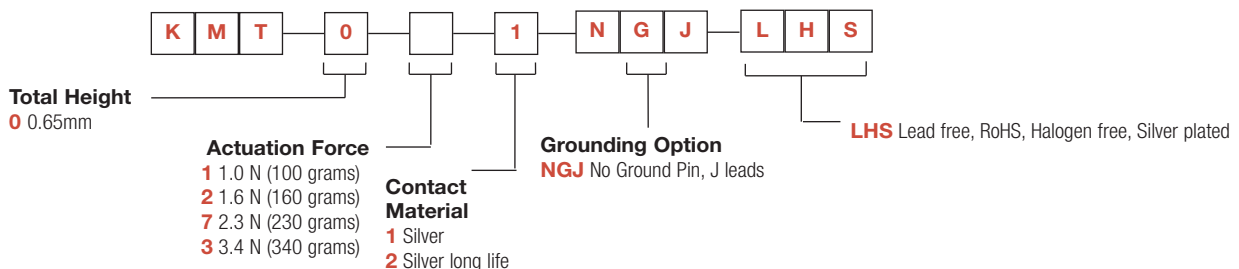
## Packaging

In reels of 5,000 pieces.  
Dimensions of reels according to EIA 481B  
External diameter 180 mm

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## Part Number Description

For any part number different from those listed above, please consult your local representative.

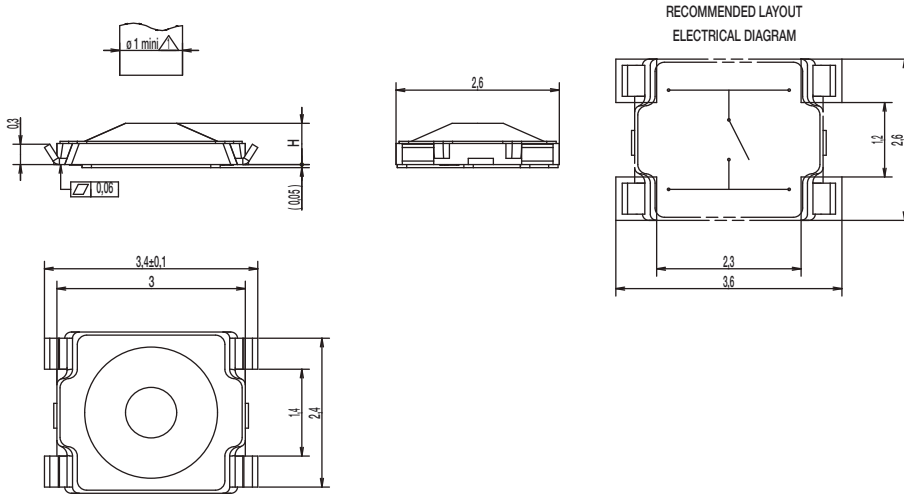


# KMT0 Series Nano-Miniature SMT Top Actuated

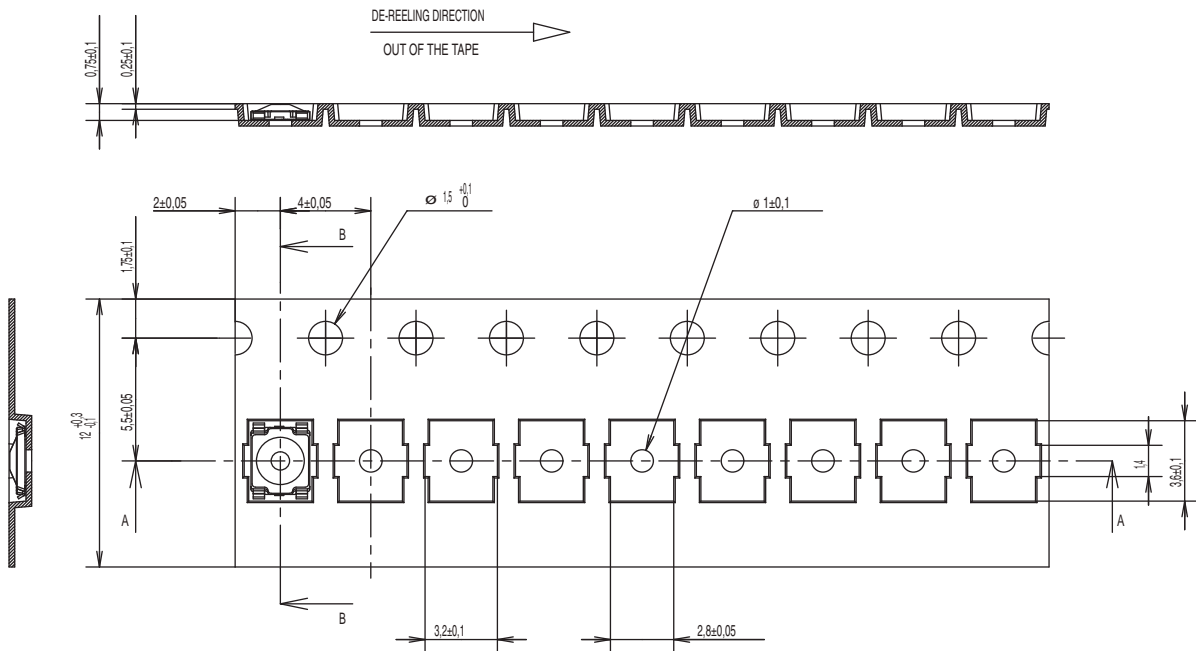
Minimum actuator diameter is 1.0 mm. It is recommended to enlarge this diameter to a full flat surface covering the switch.

Tactile Switches

B



## TAPE & REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change

# KMR 2 Series Microminiature SMT Top Actuated

## Features/Benefits

- Small footprint
- 4 actuation forces
- Excellent tactile feel
- Ultra low current capabilities
- IP40

## Typical Applications

- Automotive
- Industrial electronics
- Medical equipment



B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: Gullwing type for SMT

## Mechanical

Type G and NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR211 LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR211 ULC LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR213 LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR213 ULC LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR221 LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR221 ULC LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR223 LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR223 ULC LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR231 LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR231 ULC LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR232 LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR232 ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR233 LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR233 ULC LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR241 LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR241 ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR242 LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR242 ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR243 LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR243 ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

\*For ULC version minimum current is 1µA at 1.8 VDC

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

Infrared Reflow Soldering in accordance with IEC61760-1

## Packaging

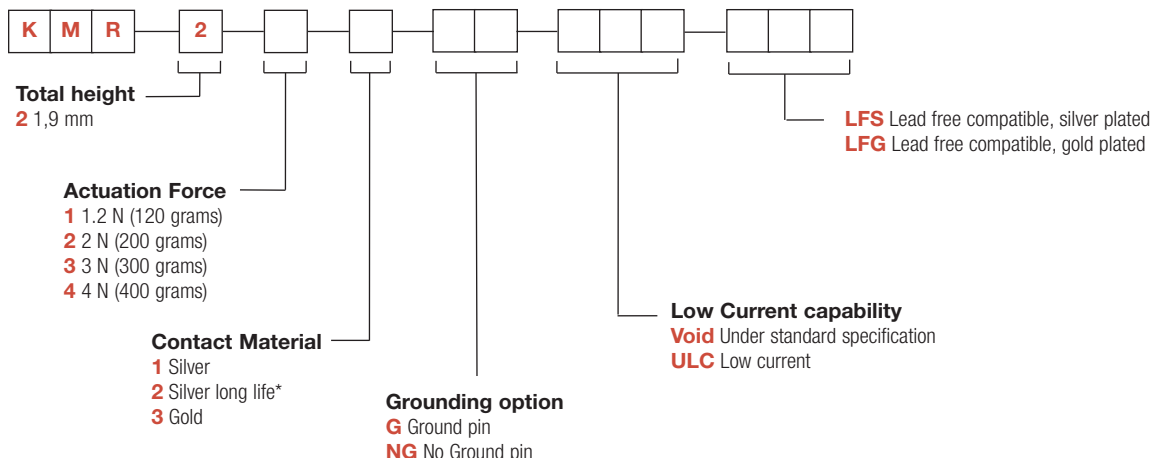
In reels of 7,000 pieces  
External diameter 330 mm ± 2 mm

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 2 series with actuation force in 2N - 3N - 4N: ≥ 30%  
KMR 2 series with actuation force in 1.2N: ≥ 20%

## Part Number Description

For any part number different from those listed above, please consult your local representative.



\* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.



# KMR 2 Series Microminiature Tact Switch for SMT

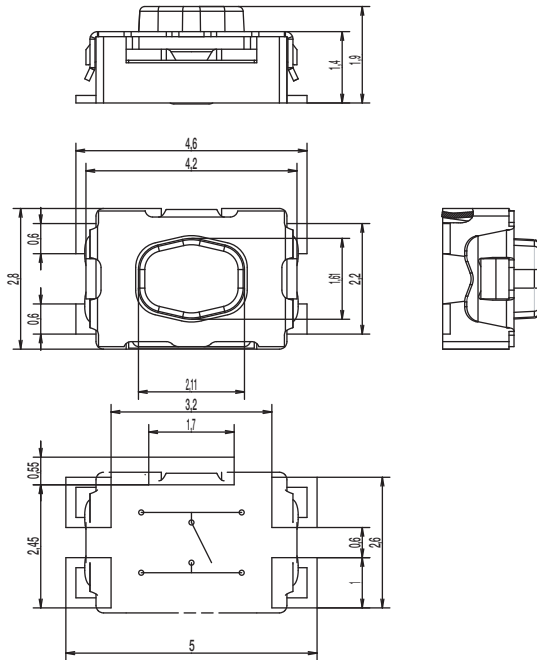
KMR 2 Series - 1.9 mm height

PCB layout shown with ground pin option

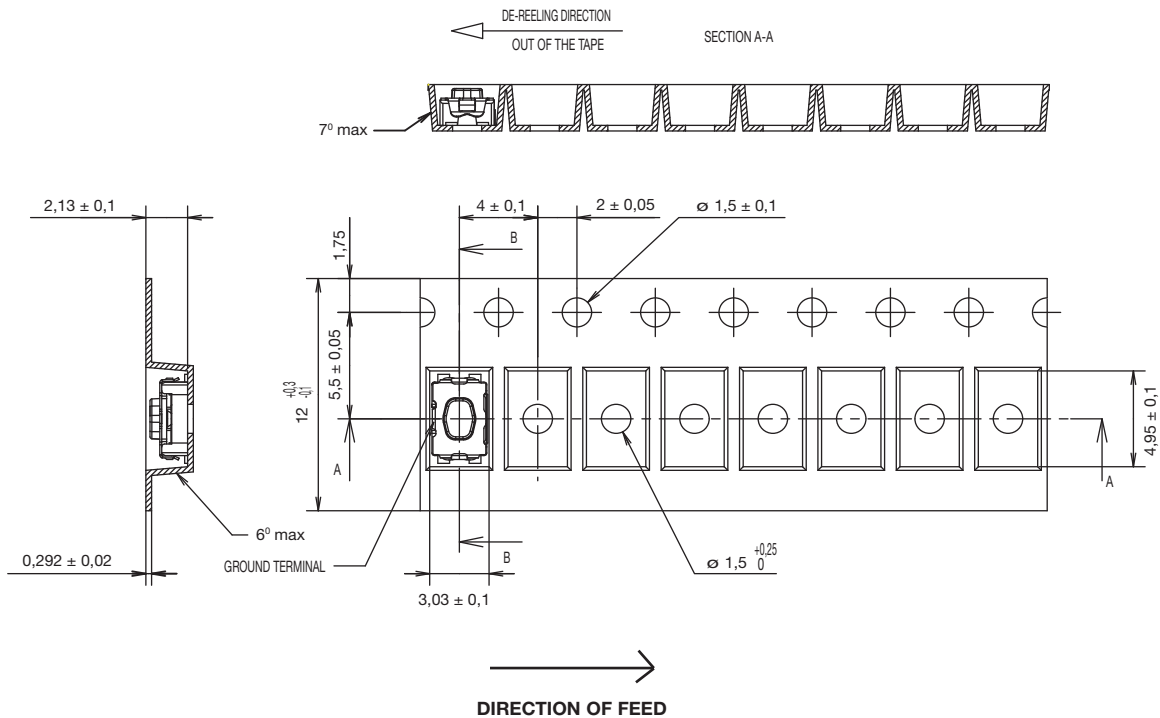


B

Tactile Switches



## TAPE & REEL



First Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change



8 jun 16

B-12

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# KMR 4 Series Microminiature SMT Top Actuated

## Features/Benefits

- Small footprint
- 4 actuation forces
- Excellent tactile feel
- Ultra low current capabilities
- IP40

## Typical Applications

- Automotive
- Industrial electronics
- Medical equipment



B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: Gullwing type for SMT

## Mechanical

Type G and NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR411 LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR411 ULC LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR413 LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR413 ULC LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR421 LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR421 ULC LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR423 LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR423 ULC LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR431 LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR431 ULC LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR432 LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR432ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR433 LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR433ULC LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR441 LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR441 ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR442 LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR442 ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR443 LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR443 ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

\*For ULC version minimum current is 1µA at 1.8 VDC

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

Infrared Reflow Soldering in accordance with IEC61760-1

## Packaging

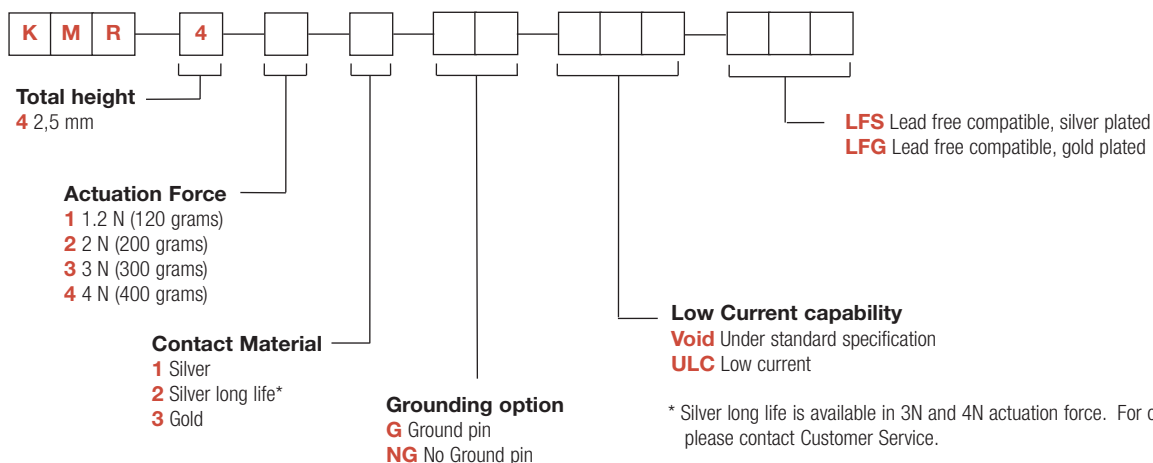
In reels of 6,000 pieces  
External diameter 330 mm ± 2 mm

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 4 series with actuation force in 2N - 3N - 4N: ≥ 25%  
KMR 4 series with actuation force in 1.2N: ≥ 20%

## Part Number Description

For any part number different from those listed above, please consult your local representative.



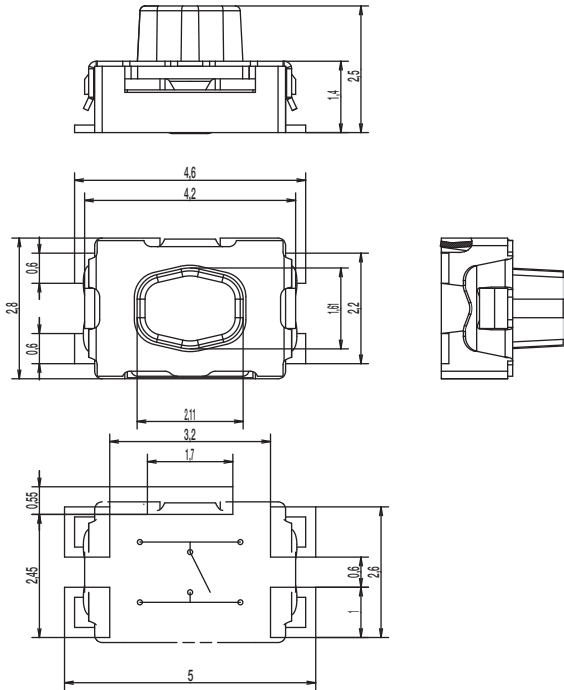
# KMR 4 Series Microminiature Tact Switch for SMT

KMR 4 Series - 2.5 mm height

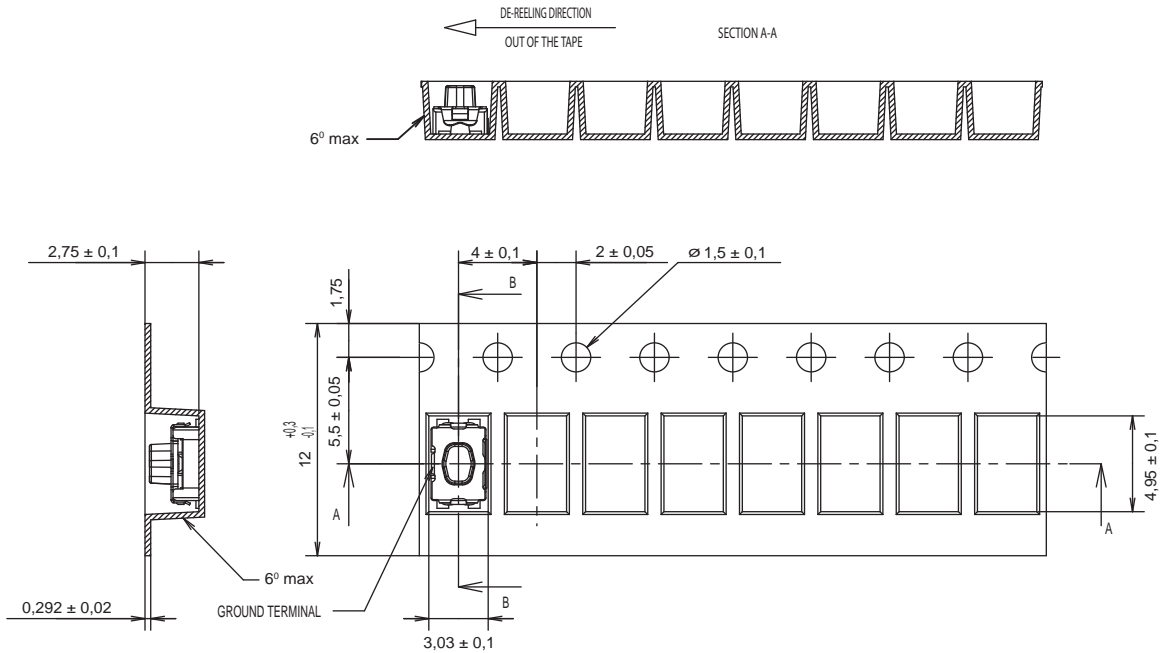
PCB layout shown with ground pin option

B

Tactile Switches



## TAPE & REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change



# KMS Series Microminiature SMT Side Actuated

## Features/Benefits

- Compact size
- Excellent tactile feel
- ESD protection
- Positioning pegs for stability
- RoHS compliant and compatible

## Typical Applications

- Mobile phones
- Medical handheld monitors
- Consumer electronics
- Telecommunication networks



B

Tactile Switches

## Specification

FUNCTION: Momentary  
CONTACT ARRANGEMENT: SPST, N.O.  
TERMINALS: Gullwing type for SMT  
IP40 Sealed

## Mechanical

OVERLOAD: 20N  
TACTILE FEELING: 15% min. for the 2N version  
25% min for the 2.5N version

Type	Operating force Newtons (grams)	Operating life (operations)	Travel
KMS221G/GP	2N (200) ± 0.5	100 K cycles	0,25 ± 0,15
KMS223G/GP	2N (200) ± 0.5	100 K cycles	0,25 ± 0,15
KMS231G/GP	3N (300) ± 0.6	100 K cycles	0,3 ± 0,15
KMS233G/GP	3N (300) ± 0.6	100 K cycles	0,3 ± 0,15

**Note:** Specifications listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Packaging

Tape and reels in reels of 3,000 pieces.  
External diameter 330mm ± 2mm.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MAXIMUM CURRENT DC:	50 mA	10 mA
MINIMUM CURRENT DC:	1 mA	1 mA
DIELECTRIC STRENGTH:	250 VDC	
CONTACT RESISTANCE:	≤100 mΩ	
INSULATION RESISTANCE:	10 <sup>9</sup> Ω	
BOUNCE TIME:	≤ 3 ms	

## Environmental

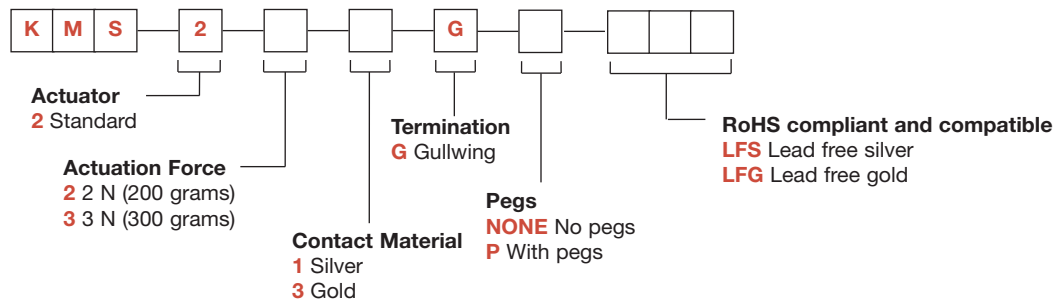
	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

Infrared reflow soldering in accordance with IEC 61760-1

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

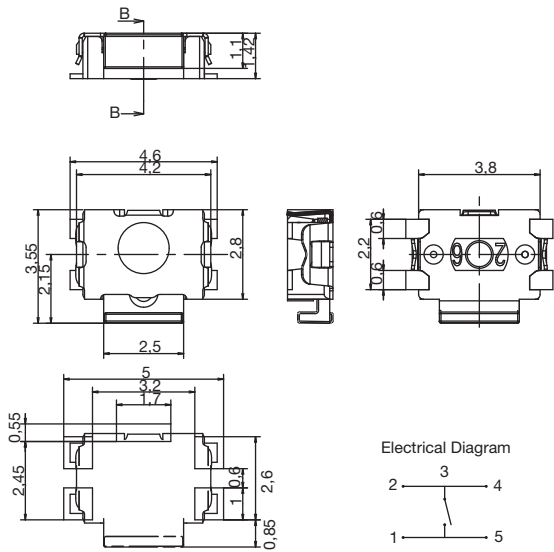


# KMS Series Microminiature SMT Side Actuated

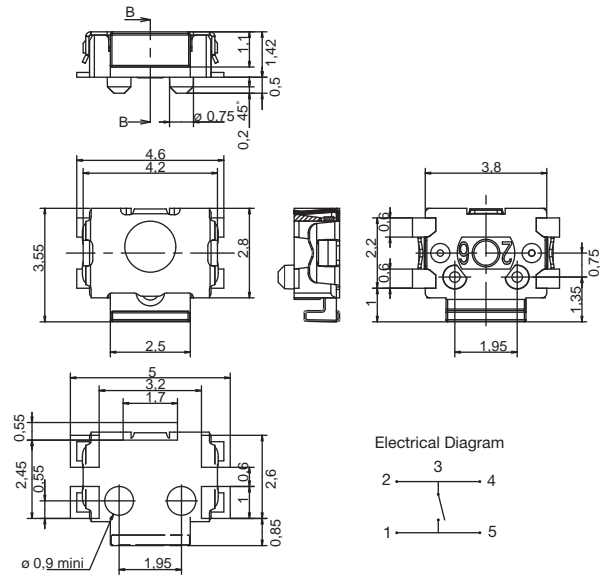
Tactile Switches

B

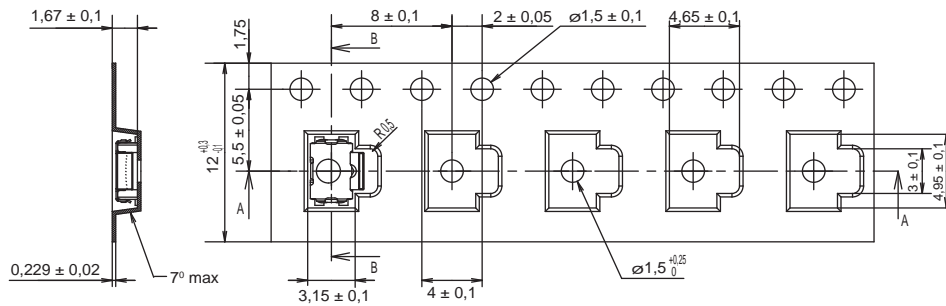
## KMS



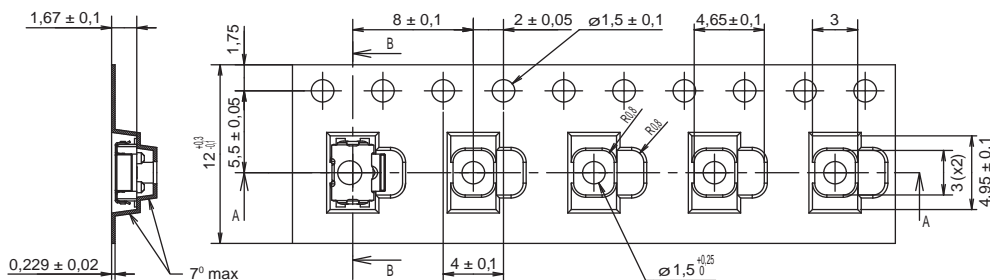
## KMS WITH PEGS



## TAPE & REEL



## WITH PEGS



→  
DIRECTION OF FEED



First Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change



# PTS 525 Series Microminiature Tact Switch for SMT

## Features/Benefits

- 0.8 & 1.5 mm actuator height
- Ruggedized package in a compact size
- High number of cycles

## Typical Applications

- Consumer products
- Instrumentation
- Remote controls



B

Tactile Switches

## Specification

FUNCTION: Momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.

## Electrical

MAXIMUM VOLTAGE: 15 VDC  
MAXIMUM CURRENT DC: 20 mA  
DIELECTRIC STRENGTH: 250 VA C (1mn)  
CONTACT RESISTANCE:  $\leq 100 \text{ m}\Omega$   
INSULATION RESISTANCE:  $\geq 100 \text{ M}\Omega$   
BOUNCE TIME:  $\leq 10 \text{ ms}$

## Environmental

OPERATING TEMPERATURE:  $-20^\circ\text{C}$  to  $70^\circ\text{C}$

## Process

SOLDERING: This component is suited to the following methods:  
Infrared Reflow Soldering in accordance with IEC61760-1

## Packaging

Switches in reels of:  
5,000 pieces in 0.8 mm height  
4,000 pieces in 1.5 mm height  
Dimensions of reels according to EIA 481B  
External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Please see chart below for full part numbers.

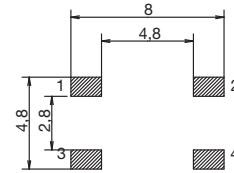
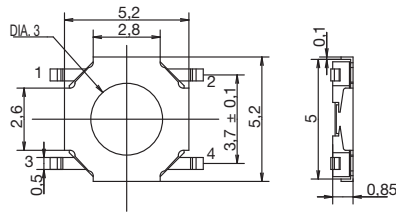
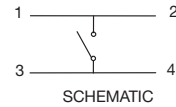
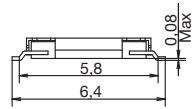
Part Number	Height (mm)	Leads Shape	Ground Pin	Force	Travel (mm)	Operating Life
PTS525 SM08 SMTR 2 LFS	0.8	G	No	160 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	1,000,000
PTS525 SK08 SMTR 2 LFS	0.8	G	No	260 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	200,000
PTS525 SM15 SMTR 2 LFS	1.5	G	No	160 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	1,000,000
PTS525 SK15 SMTR 2 LFS	1.5	G	No	260 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	500,000
PTS525 SMG15 SMTR 2 LFS	1.5	G	Yes	160 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	1,000,000
PTS525 SKG15 SMTR 2 LFS	1.5	G	Yes	260 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	500,000
PTS525 SMG15J SMTR 2 LFS	1.5	J	Yes	160 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	1,000,000
PTS525 SKG15J SMTR 2 LFS	1.5	J	Yes	260 gf $\pm$ 50 gf	0.25 $\pm$ 0.2	500,000



Dimensions are shown: mm  
Specifications and dimensions subject to change

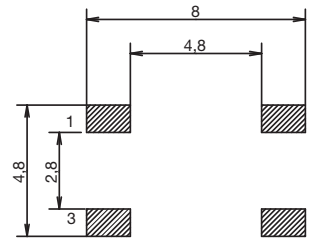
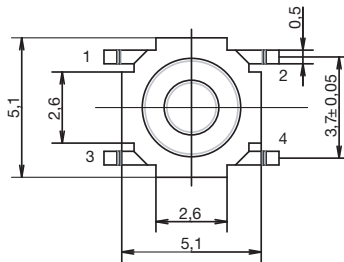
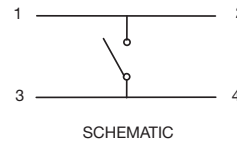
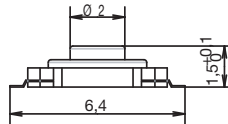
# PTS 525 Series Microminiature Tact Switch for SMT

**PTS525 SM08 SMTR2 LFS**  
**PTS525 SK08 SMTR2 LFS**



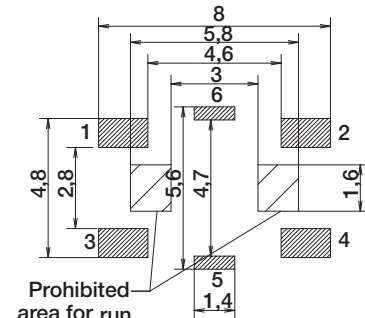
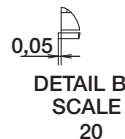
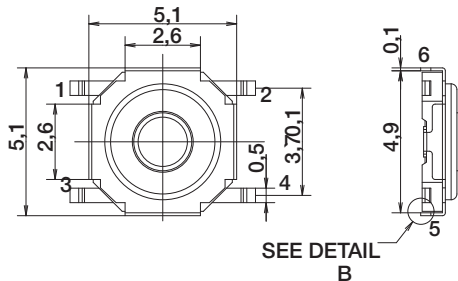
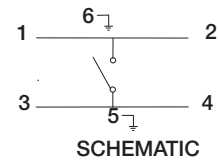
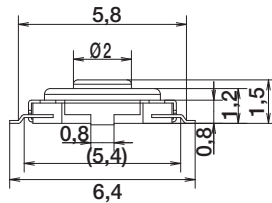
RECOMMENDED PCB LAYOUT

**PTS525 SM15 SMTR2 LFS**  
**PTS525 SK15 SMTR2 LFS**



RECOMMENDED PCB LAYOUT

**PTS525 SMG15 SMTR2 LFS**  
**PTS525 SKG15 SMTR2 LFS**



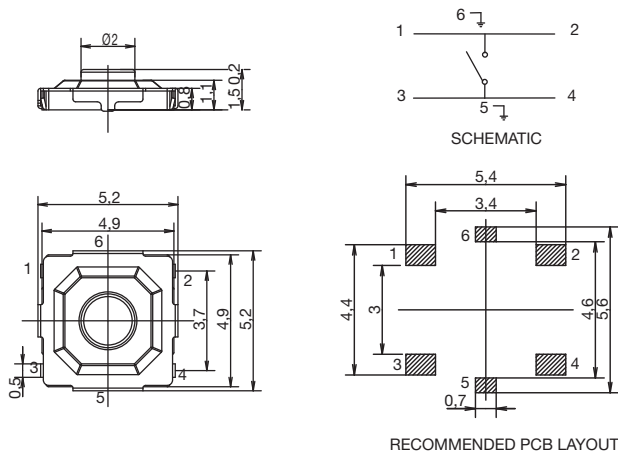
RECOMMENDED PCB LAYOUT

*Dimensions are shown: mm  
Specifications and dimensions subject to change*



# PTS 525 Series Microminiature Tact Switch for SMT

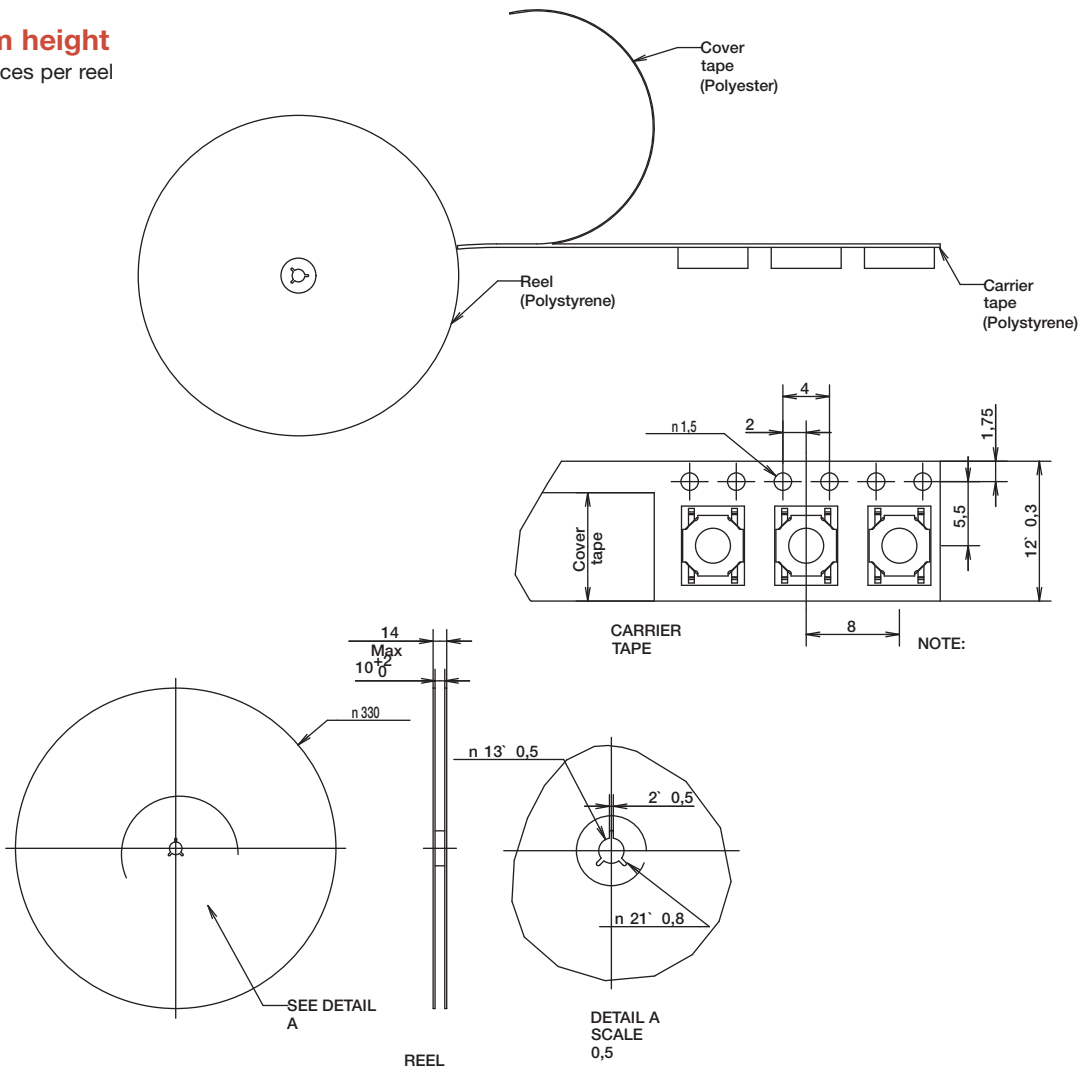
PTS525 SMG15J SMTR2 LFS  
PTS525 SKG15J SMTR2 LFS



B  
Tactile Switches

## TAPE & REEL

**0.8 mm height**  
5,000 pieces per reel



Dimensions are shown: mm  
Specifications and dimensions subject to change

# PTS 525 Series Microminiature Tact Switch for SMT

## TAPE & REEL

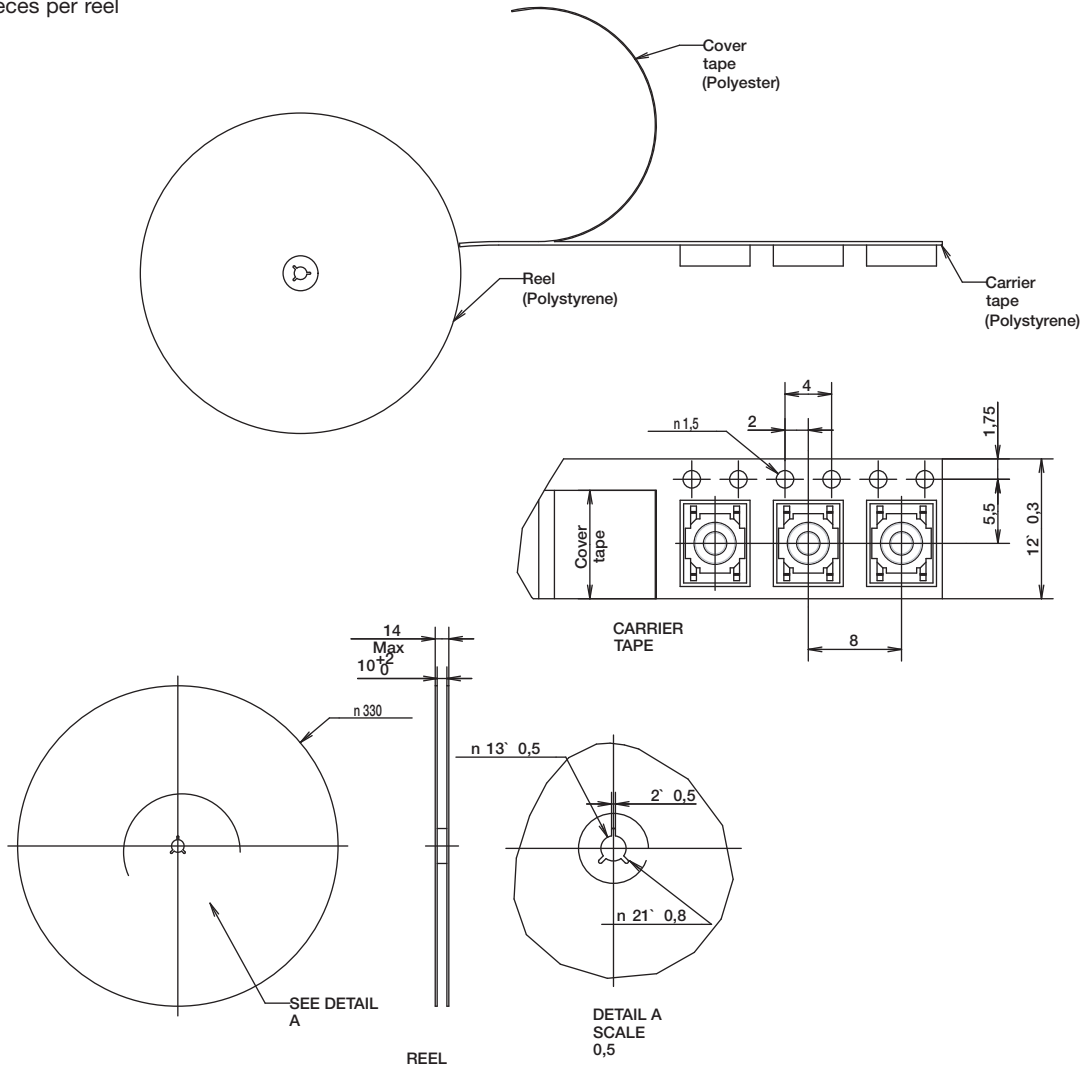
**1.5 mm height**

4,000 pieces per reel



**B**

**Tactile Switches**



First Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

# PTS 530 Series Ultra Low Profile SMT Top Actuated

## Features/Benefits

- 4.5 x 4.5 mm footprint
- 0.55 mm thickness
- High number of cycles
- Symbol line identification

## Typical Applications

- MP3 accessories
- Bluetooth headset
- Remote controls
- Garage door opener



B

Tactile Switches

## Specifications

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
 TERMINALS: Gullwing for SMT  
 TRAVEL: 0.2mm - 0.1 /+ 0.15mm

Part Number	Operating Force (gf)	Operating Life (operations)
PTS530 GN055 SMTR LFS	100 ± 30	1,000,000
PTS530 GM055 SMTR LFS	160 ± 30	1,000,000
PTS530 GH055 SMTR LFS	200 ± 30	200,000
PTS530 GK055 SMTR LFS	260 ± 30	200,000
PTS530 GG065 SMTR LFS	400 ± 70	300,000
PTS530 GS065 SMTR LFS	600 - 50/+100	150,000

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 250 VA C (1mn)  
 CONTACT RESISTANCE: ≤ 100 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

## Packaging

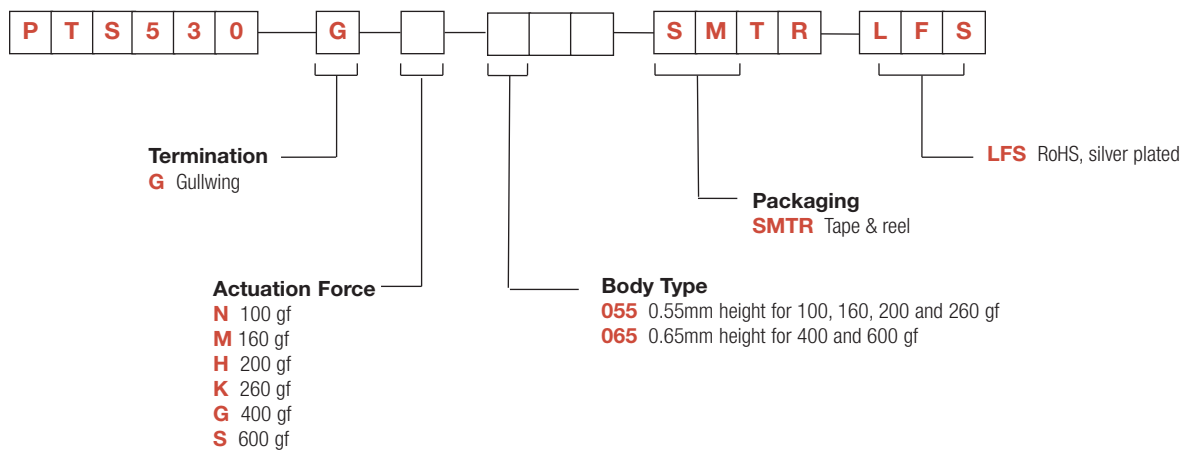
Switches in reels of 7,000 pieces.  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

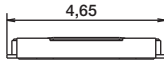
For any part number different from those listed above, please consult your local representative.



# PTS 530 Series Ultra Low Profile SMT Top Actuated

## TERMINATION

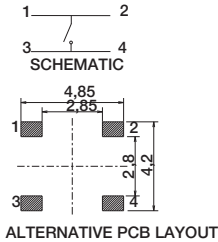
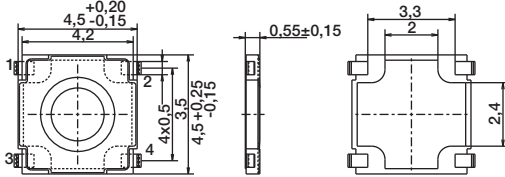
**G** GULLWING



## BODY TYPE / ACTUATION FORCE

Tactile Switches

**055** 0,55 MM HEIGHT

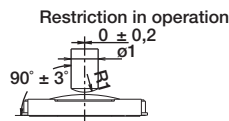
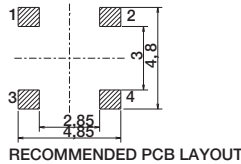
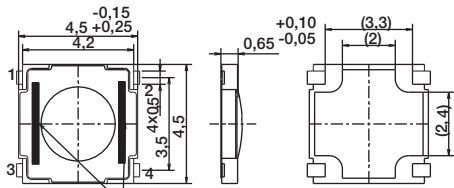
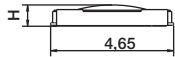


Actuation force identification lines:

N: 100 gf	
M: 160 gf	No Lines
H: 200 gf	
K: 260 gf	

**065** 0,65 MM HEIGHT

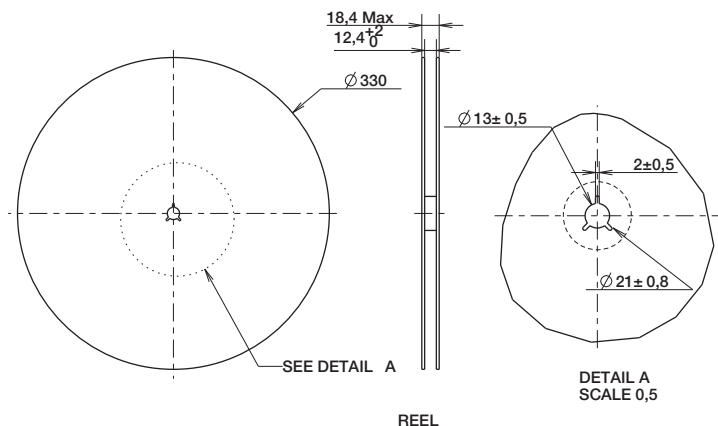
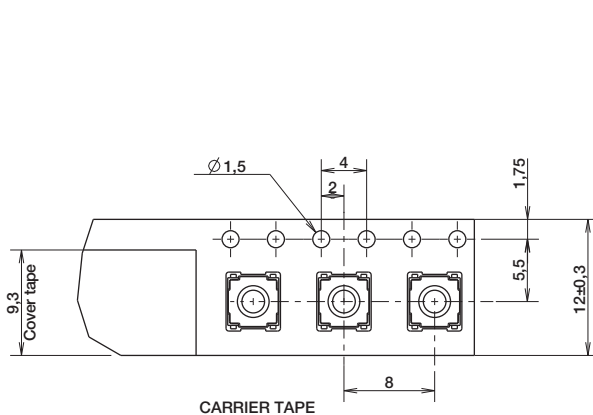
PART NUMBER	HEIGHT
PTS 530 GS 065 SMTR LFS	+0.1 -0.05 0.72
PTS 530 GG 065 SMTR LFS	0.68



Force symbol lines for 600 gf  
No symbol line for 400 gf

G: 400 gf	No Lines
S: 600 gf	

## TAPE & REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change



# PTS 540 Series Ultra Low Profile SMT Top Actuated

## Features/Benefits

- 3.7 x 3.7 mm footprint
- 0.35 mm thickness
- High number of cycles

## Typical Applications

- MP3 accessories
- Bluetooth headset
- Remote controls



B

Tactile Switches

## Specifications

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
TERMINALS: J type for SMT  
TRAVEL: 0.15 mm ± 0.1 mm

## Mechanical

Part Number	Operating Force (gf)	Operating Life (operations)
PTS540 JM035 SMTR LFS	160 ± 50	500,000
PTS540 JK035 SMTR LFS	230 ± 50	300,000

## Packaging

Switches in reels of 10,000 pieces.  
Dimensions of reels according to EIA 481B  
External diameter 330 mm

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
MAXIMUM CURRENT DC: 50 mA  
DIELECTRIC STRENGTH: 250 VA C (1mn)  
CONTACT RESISTANCE: ≤ 100 mΩ  
INSULATION RESISTANCE: ≥ 100 MΩ  
BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -30°C to 85°C

## Process

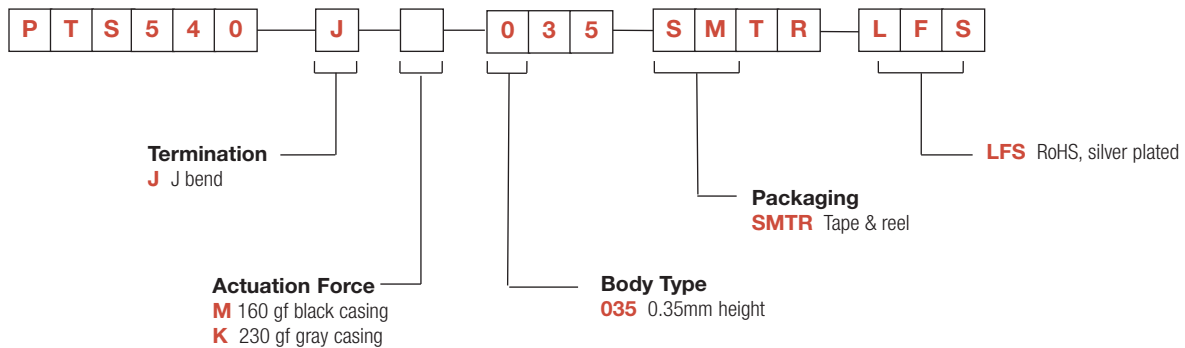
SOLDERING: This component is suited to the following methods:  
Infrared Reflow Soldering in accordance with IEC61760-1

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.

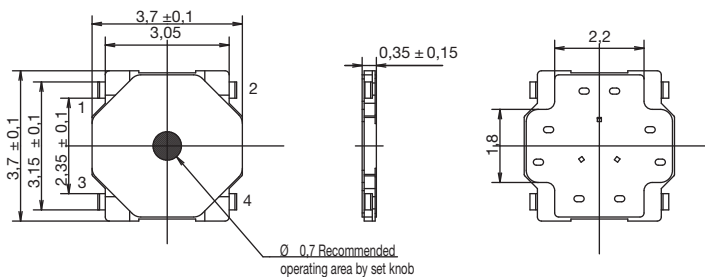


# PTS 540 Series Ultra Low Profile SMT Top Actuated

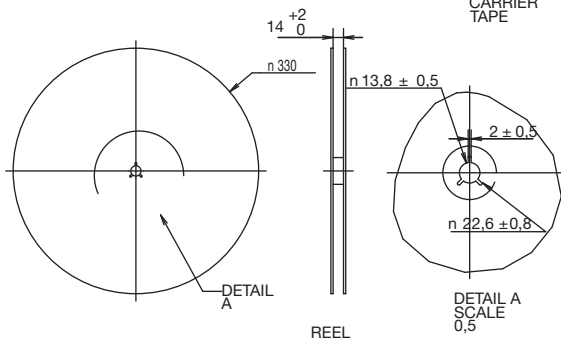
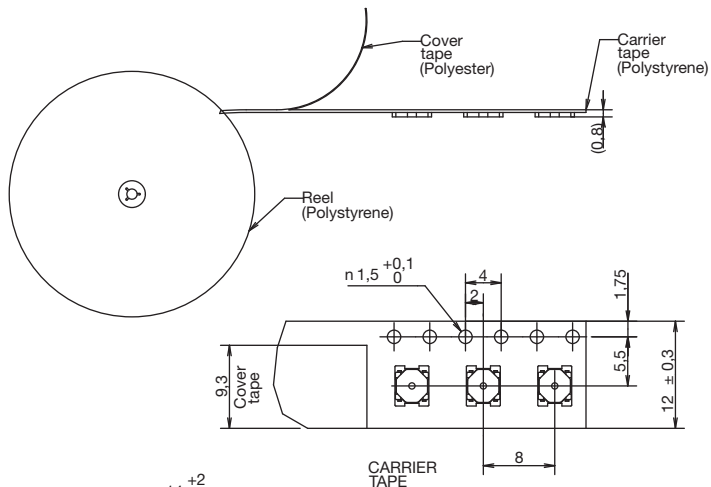
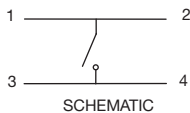
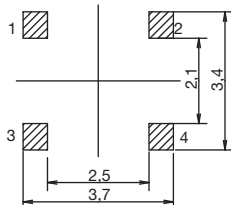
PTS 540

Tactile Switches

B



RECOMMENDED PCB



# PTS 810 Series Microminiature SMT Top Actuated

## Features/Benefits

- 4.2 x 3.2 mm footprint
- 2.5 mm thickness
- High number of cycles
- Color coded actuators

## Typical Applications

- Control panels
- Nomad devices
- Remote controls
- Keyless entry system



## Specifications

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
 TERMINALS: J type for SMT  
 TRAVEL: 160 & 260 gf: 0.15mm ± 0.1mm  
 400 & 600 gf: 0.20mm ± 0.1mm

	Operating Force (gf)	Operating Life (operations)
PTS810 SJM 250 SMTR LFS	160 ± 50	150,000
PTS810 SJK 250 SMTR LFS	260 ± 70	50,000
PTS810 SJG 250 SMTR LFS	400 ± 100	100,000
PTS810 SJS 250 SMTR LFS	600 ± 150	150,000

## Packaging

Switches in reels of 2,900 pieces.  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

## Electrical

MAXIMUM VOLTAGE: 16 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 250 VA C (1mn)  
 CONTACT RESISTANCE: ≤ 500 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C

## Process

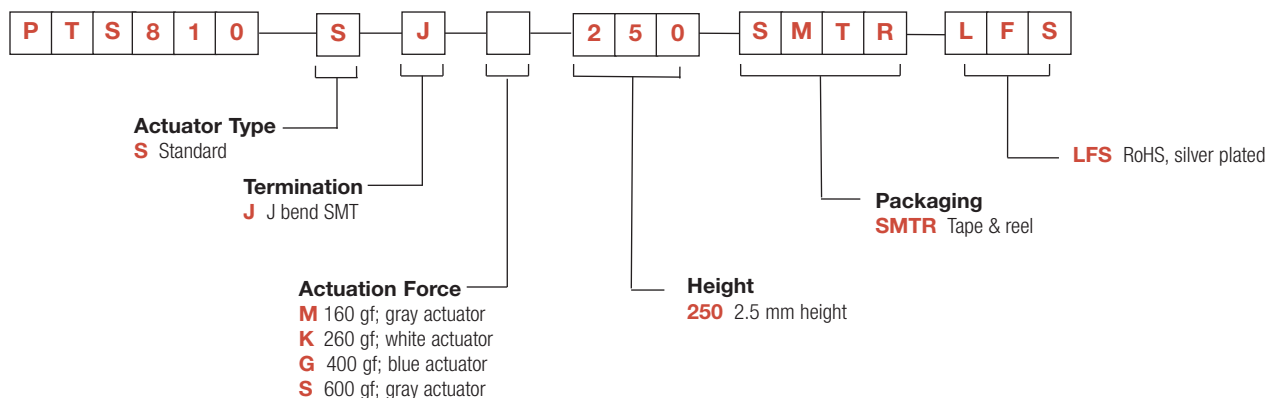
SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.



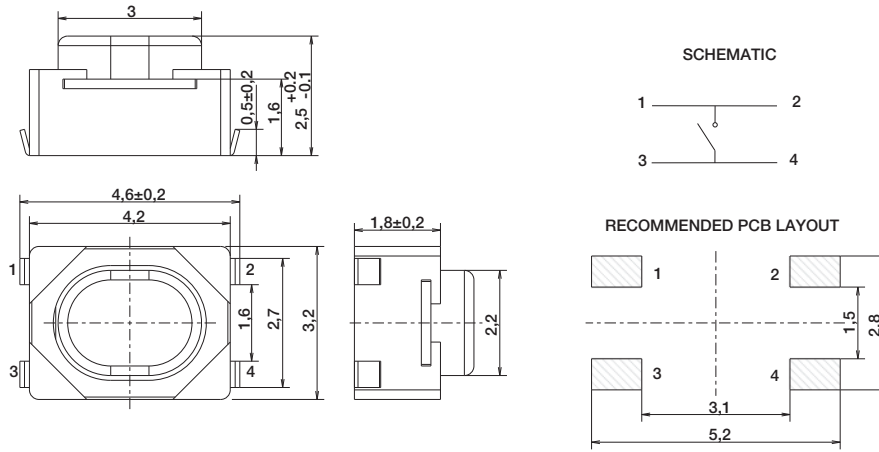
# PTS 810 Series Microminiature SMT Top Actuated

PTS810

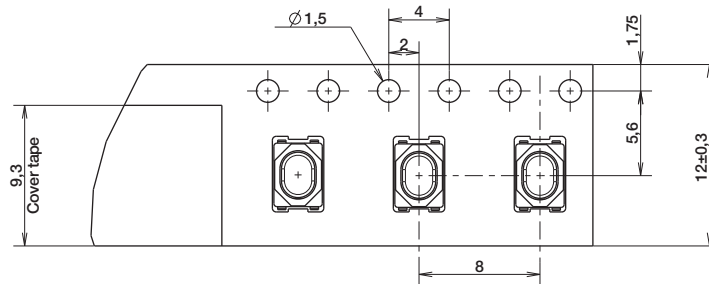


B

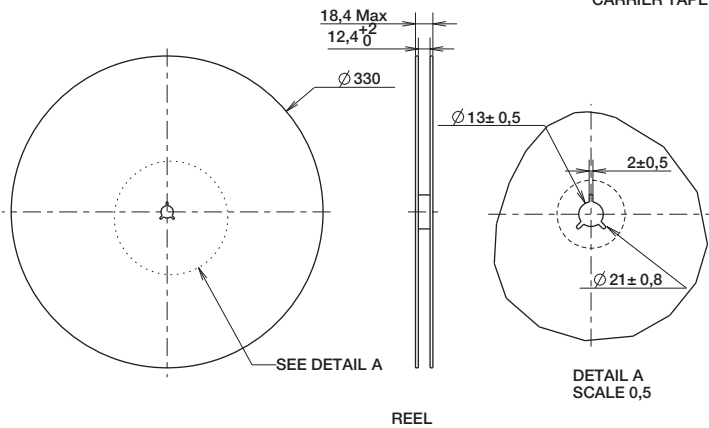
Tactile Switches



## TAPE & REEL



CARRIER TAPE



Dimensions are shown: mm  
Specifications and dimensions subject to change

# PTS 820 Series Microminiature SMT Top Actuated

## Features/Benefits

- 3.9 x 2.9 mm footprint
- Three different heights
- High number of cycles
- Reduced footprint

## Typical Applications

- Control panels
- Nomad devices
- Remote controls
- Keyless entry system



B

Tactile Switches

## Specifications

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
 TERMINALS: J type for SMT  
 TRAVEL: 0.2mm + 0.1mm / -0.05 mm

	Operating Force (gf)	Life Cycles	Height mm	Pegs
PTS820 J25M SMTR LFS	160 ± 50	200,000	2.5	No
PTS820 J25K SMTR LFS	250 ± 50	100,000	2.5	No
PTS820 J25MP SMTR LFS	160 ± 50	200,000	2.5	Yes
PTS820 J25KP SMTR LFS	250 ± 50	100,000	2.5	Yes
PTS820 J20M SMTR LFS	160 ± 50	200,000	2.0	No
PTS820 J20K SMTR LFS	250 ± 50	100,000	2.0	No
PTS820 J20MP SMTR LFS	160 ± 50	200,000	2.0	Yes
PTS820 J20KP SMTR LFS	250 ± 50	100,000	2.0	Yes
PTS820 J15M SMTR LFS	160 ± 50	200,000	1.5	No
PTS820 J15K SMTR LFS	250 ± 50	100,000	1.5	No
PTS820 J15MP SMTR LFS	160 ± 50	200,000	1.5	Yes
PTS820 J15KP SMTR LFS	250 ± 50	100,000	1.5	Yes

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 100 VA C (1mn)  
 CONTACT RESISTANCE: ≤ 100 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

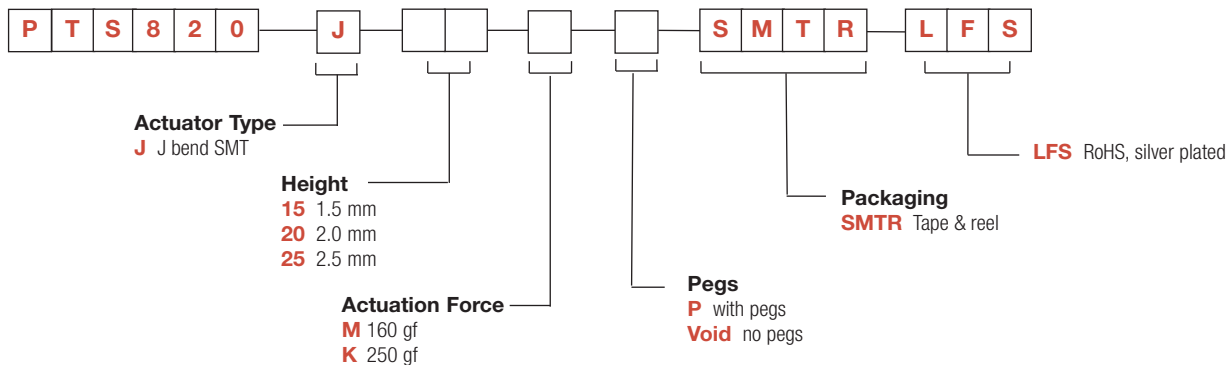
## Packaging

Switches in reels of 2,500 pieces for 1.5 and 2.0 mm height  
 Switches in reels of 2,300 pieces for 2.5 mm height  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.

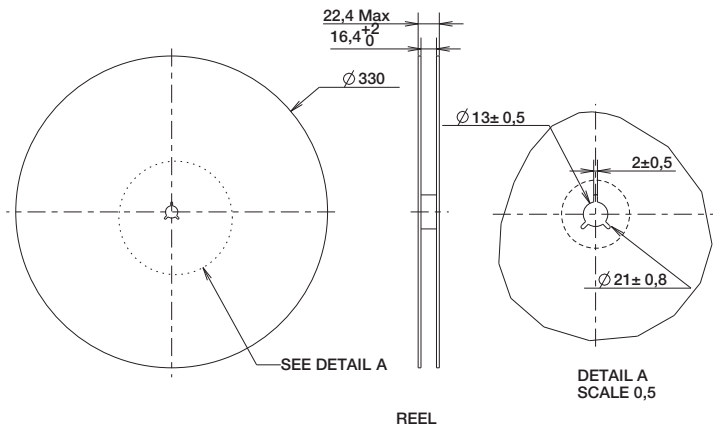
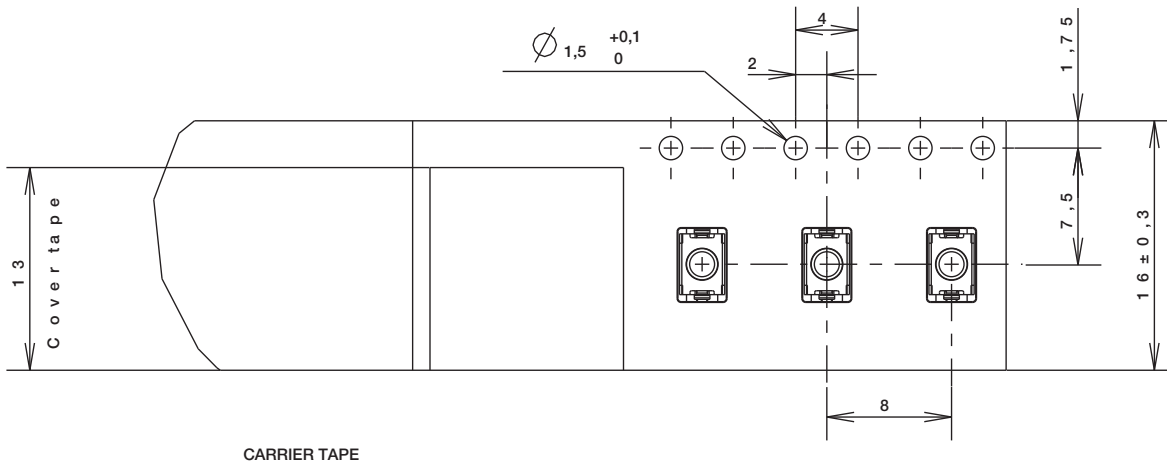
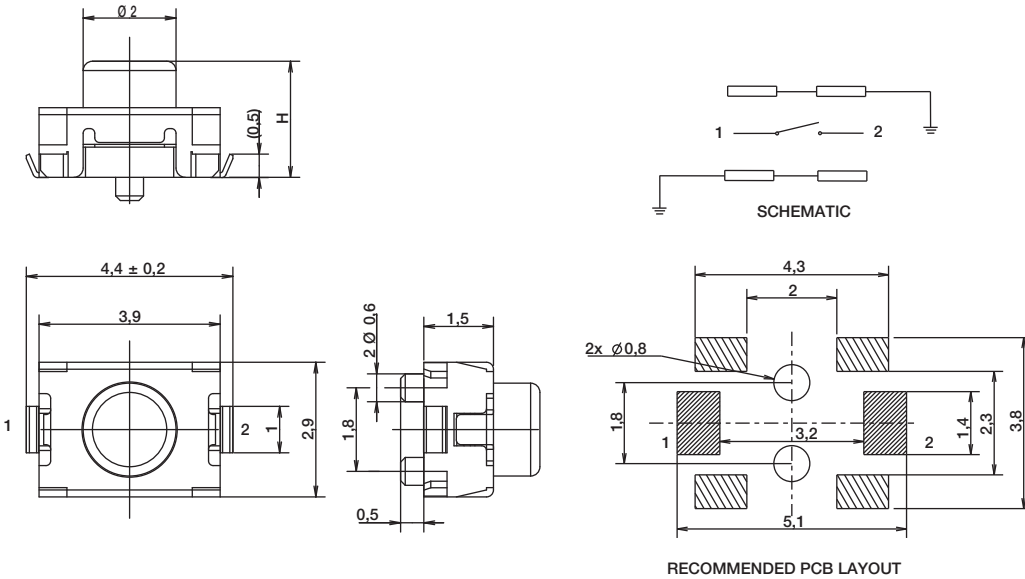


# PTS 820 Series Microminiature SMT Top Actuated

2.5 & 2.0 mm height (H) - version shown here with pegs

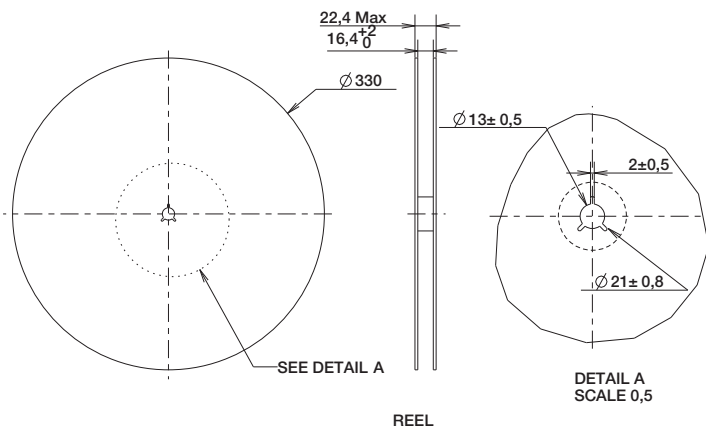
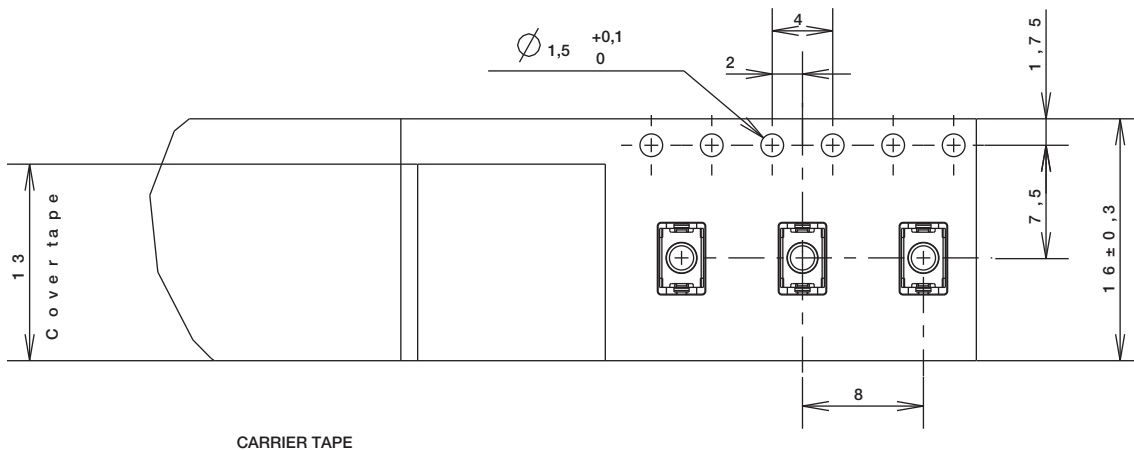
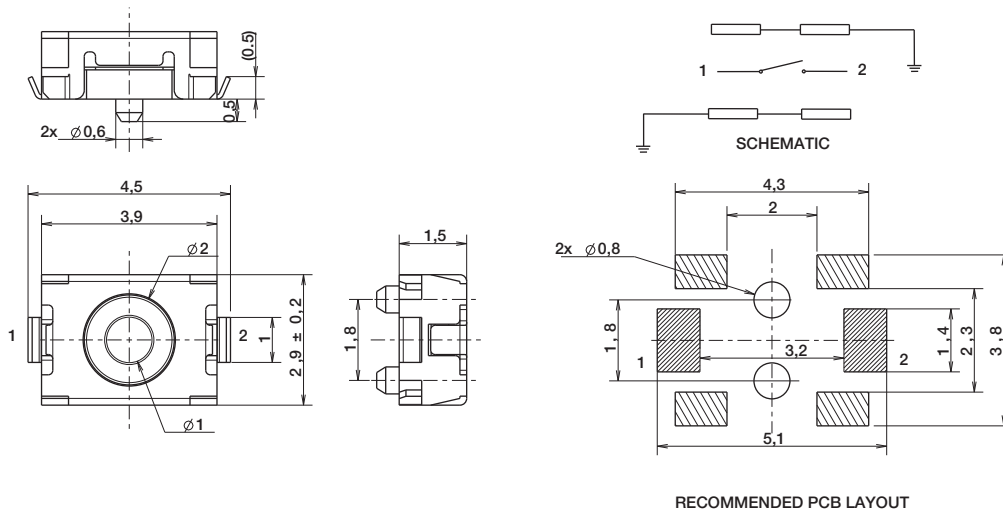
Tactile Switches

B



# PTS 820 Series Microminiature SMT Top Actuated

1.5 mm height (H) - version shown here with pegs



**B**  
Tactile Switches



Dimensions are shown: mm  
Specifications and dimensions subject to change

# PTS 830 Series Microminiature SMT Top Actuated

**NEW**



## Features/Benefits

- 3.5 x 2.6 mm footprint
- High number of cycles
- Optional ground pin

## Typical Applications

- Wearable electronics
- Nomad devices
- Remote controls
- Keyless entry system

**B**

Tactile Switches

## Specifications

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
TERMINALS: G type for SMT  
TRAVEL: 0.15 mm + 0.1 mm

	Operating Force (gf)	Life Cycles	Ground Pin
PTS830 GM140 SMTR LFS	160 ± 50	500,000	No
PTS830 GG140 SMTR LFS	450 ± 80	200,000	No
PTS830 GM140G SMTR LFS	160 ± 50	500,000	Yes
PTS830 GG140G SMTR LFS	450 ± 80	200,000	Yes

## Packaging

Switches in reels of 9,500 pieces  
Dimensions of reels according to EIA 481B  
External diameter 330 mm

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
MAXIMUM CURRENT DC: 50 mA  
DIELECTRIC STRENGTH: 100 VA C (1mm)  
CONTACT RESISTANCE: ≤ 100 mΩ  
INSULATION RESISTANCE: ≥ 100 MΩ  
BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C

## Process

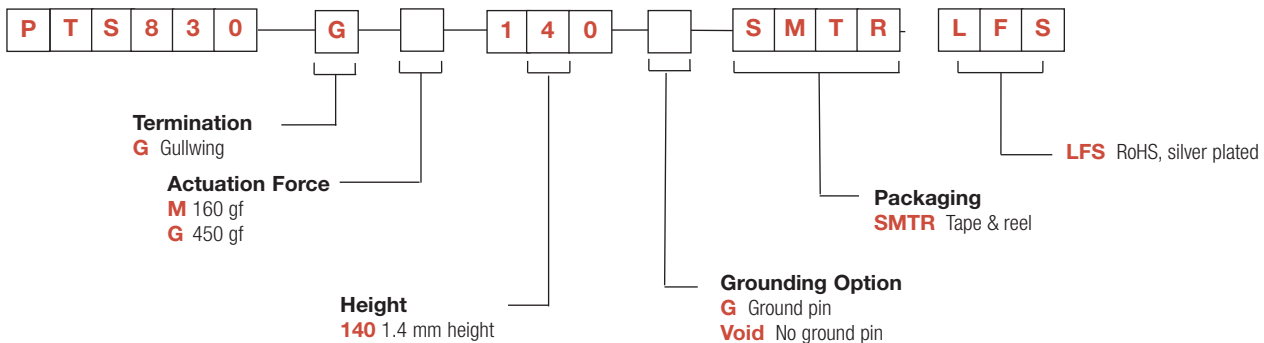
SOLDERING: This component is suited to the following methods:  
Infrared Reflow Soldering in accordance with IEC61760-1

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

For any part number different from those listed above, please consult your local representative.



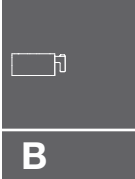
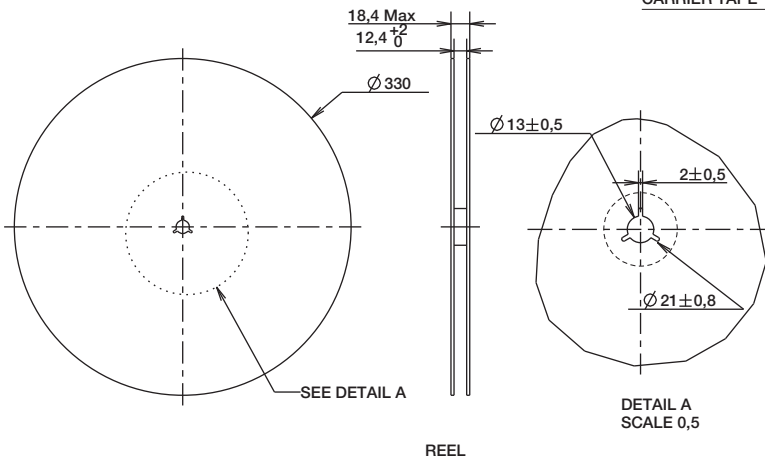
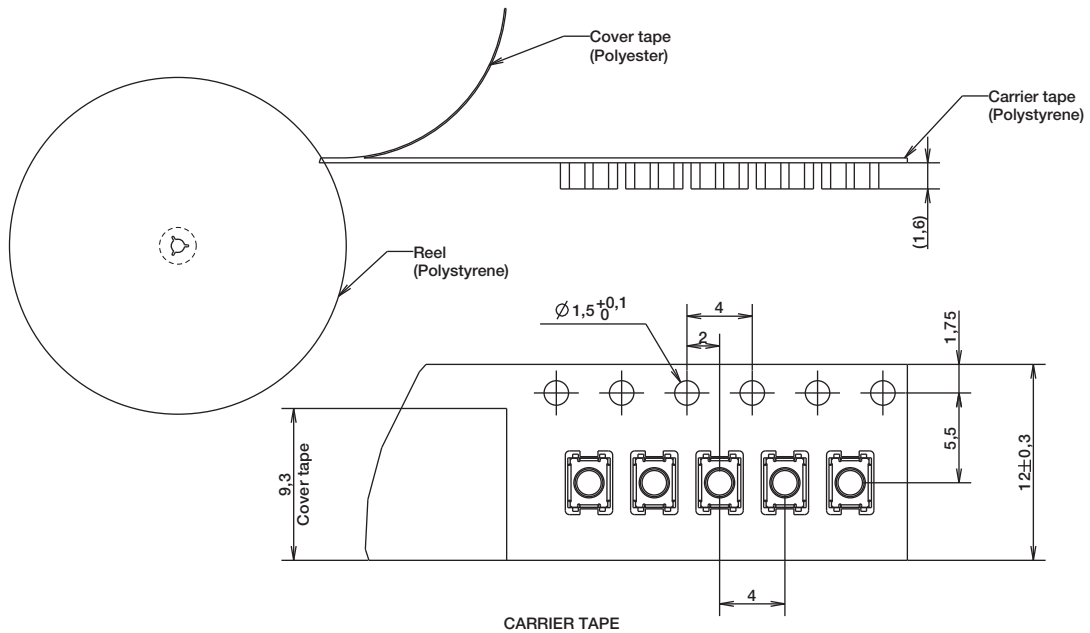
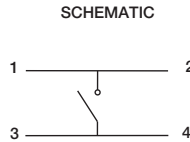
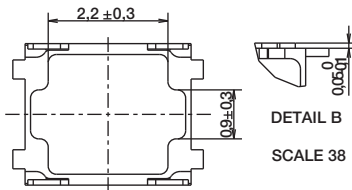
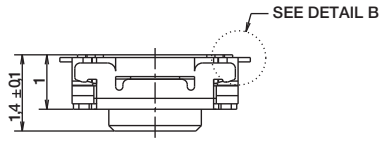
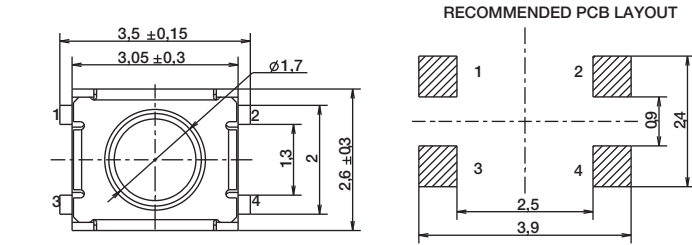
Dimensions are shown: mm  
Specifications and dimensions subject to change



NEW

# PTS 830 Series Microminiature SMT Top Actuated

PTS830 GX 140 SMTR LFS



B

Tactile Switches



Dimensions are shown: mm  
Specifications and dimensions subject to change

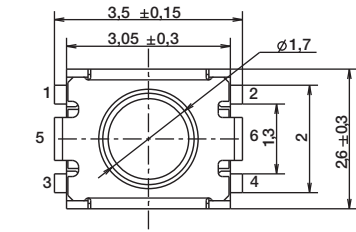
# PTS 830 Series Microminiature SMT Top Actuated

**NEW**

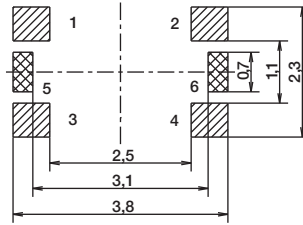
PTS830 GX 140 G SMTR LFS

Tactile Switches

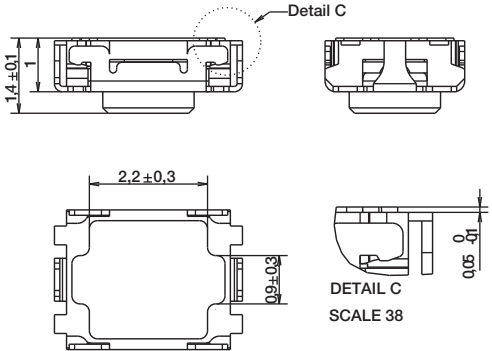
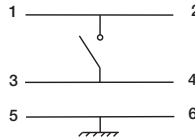
**B**



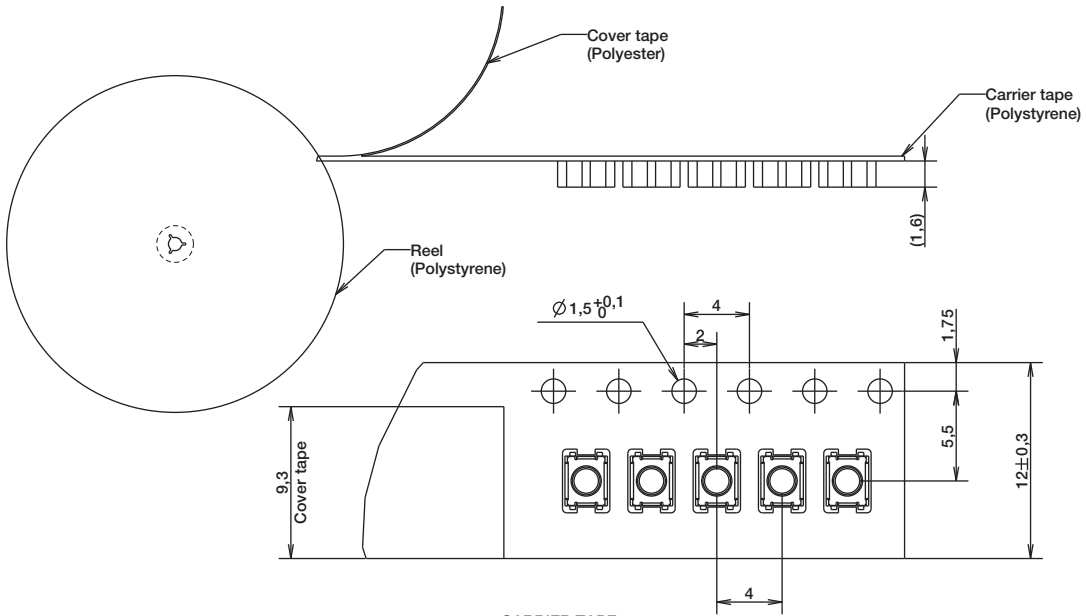
RECOMMENDED PCB LAYOUT



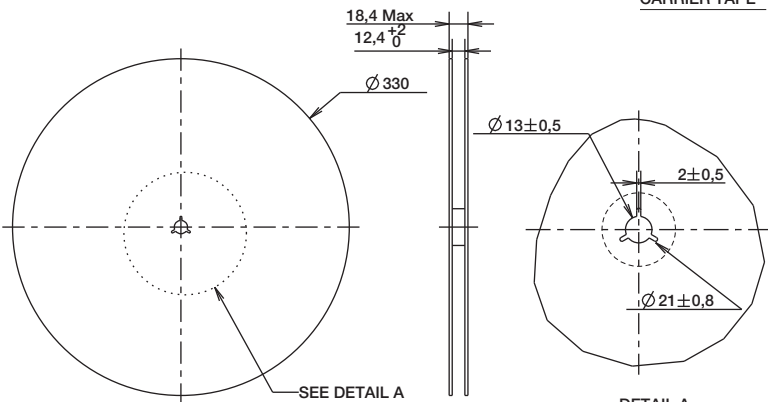
SCHEMATIC



DETAIL C  
SCALE 38



CARRIER TAPE

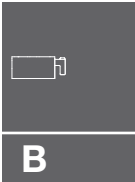


DETAIL A  
SCALE 0,5

REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change



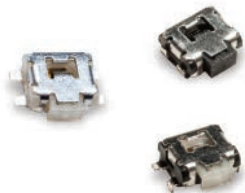
**B**

**Tactile Switches**



*Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change*

# PTS 840 Series Microminiature SMT Side Actuated



## Features/Benefits

- 3.5 x 3.55 mm footprint
- Front PIP leads option for strong shear resistance
- ESD pin option
- Reduced footprint

## Typical Applications

- Nomad devices
- Remote controls
- Personal health diagnostics
- Consumer electronics

## Specifications

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
 TERMINALS: G and front PIP types for SMT  
 TRAVEL: 0.2mm + 0.2mm / -0.1 mm  
 LIFE: 100,000 cycles

Type	Operating Force (gf)	SMT Leads	Pegs
<b>Without ground pin</b>			
PTS840 GM SMTR LFS	160 -40/+70	G leads	No
PTS840 GK SMTR LFS	220 -70/+80	G leads	No
PTS840 PM SMTR LFS	160 -40/+70	P leads	No
PTS840 PK SMTR LFS	220 -70/+80	P leads	No
PTS840 GMP SMTR LFS	160 -40/+70	G leads	Yes
PTS840 GKP SMTR LFS	220 -70/+80	G leads	Yes
<b>With ground pin</b>			
PTS840 ESDGM SMTR LFS	160 -40/+70	G leads	No
PTS840 ESDGK SMTR LFS	220 -70/+80	G leads	No
PTS840 ESDPM SMTR LFS	160 -40/+70	P leads	No
PTS840 ESDPK SMTR LFS	220 -70/+80	P leads	No
PTS840 ESDGMP SMTR LFS	160 -40/+70	G leads	Yes
PTS840 ESDGKP SMTR LFS	220 -70/+80	G leads	Yes

## Electrical

MAXIMUM VOLTAGE: 12 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 250 VA C (1mn)  
 CONTACT RESISTANCE: ≤ 500 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

## Packaging

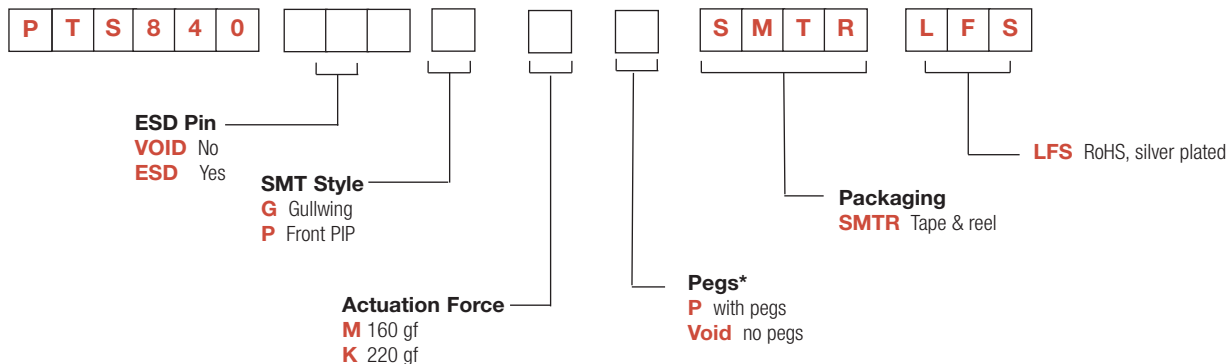
In reels of 3,500 pieces  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**For any part number different from those listed above, please consult your local representative.**

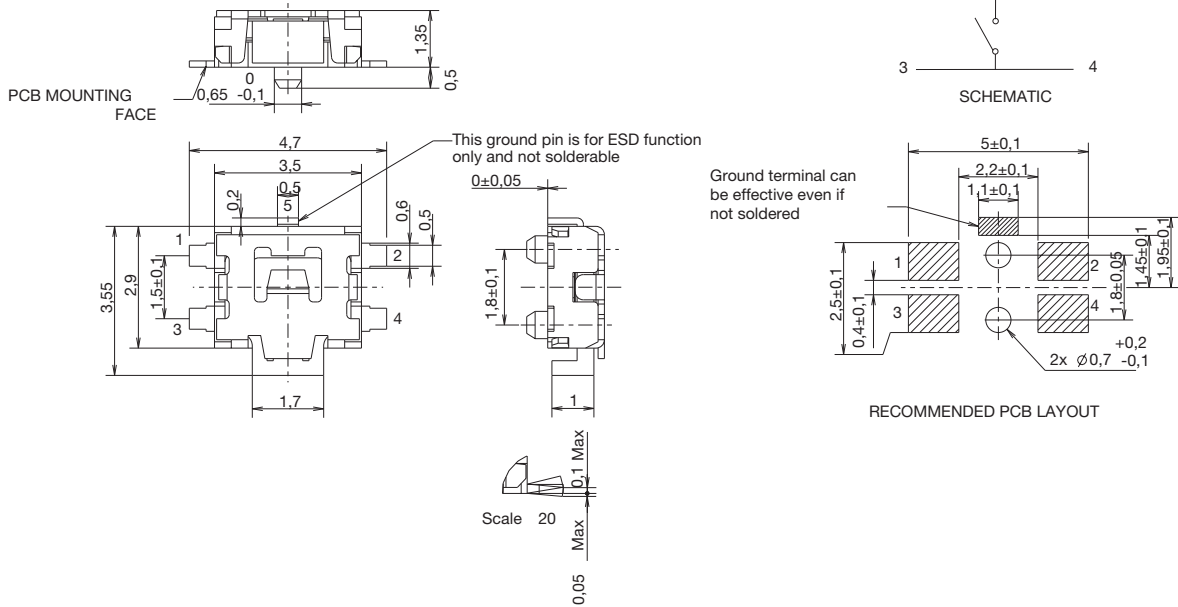


## Design Recommendations

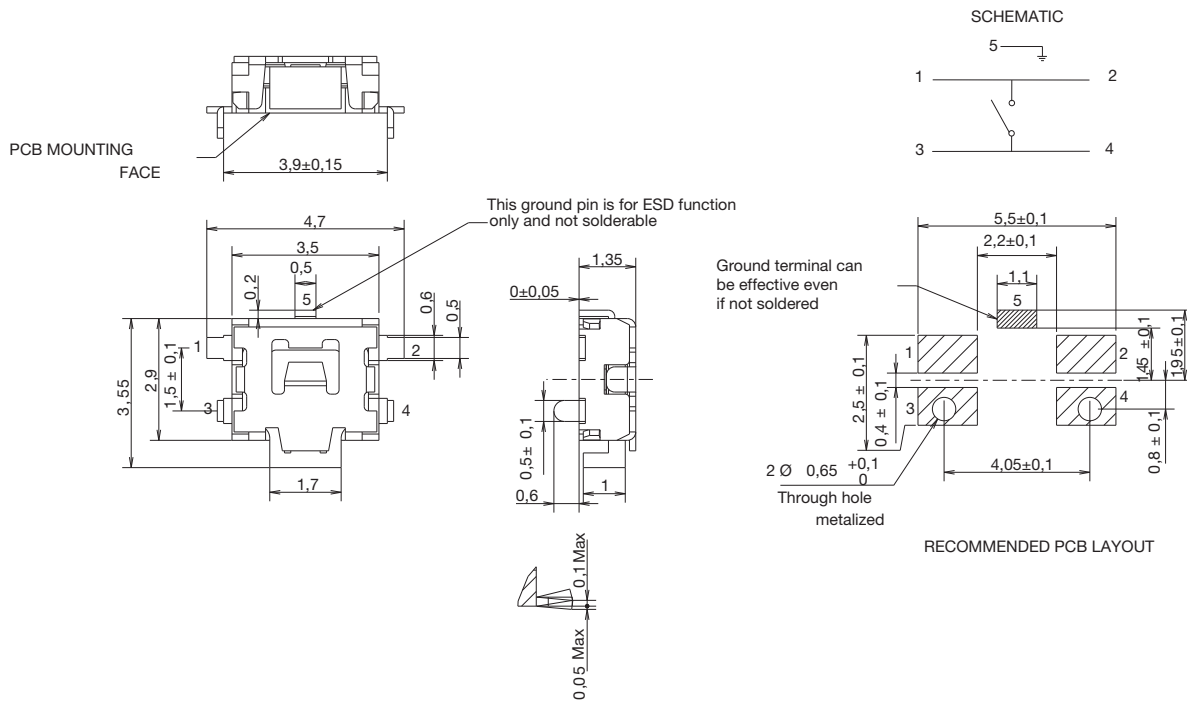
- "P" leads are recommended for applications where shear resistance is of importance
- When a precise alignment between application button and the switch is requested, version with pegs are the right choice to limit the possible floating of the switch during solderability.

# PTS 840 Series Microminiature SMT Side Actuated

## Standard G SMT Leads with ESD and Peg options

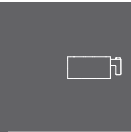


## P SMT Leads with ESD option



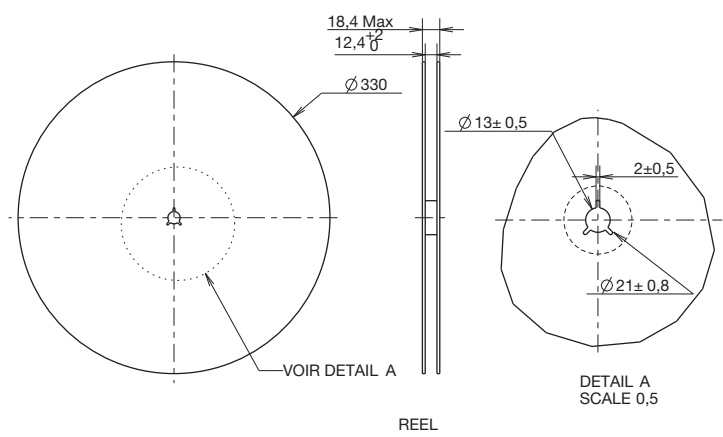
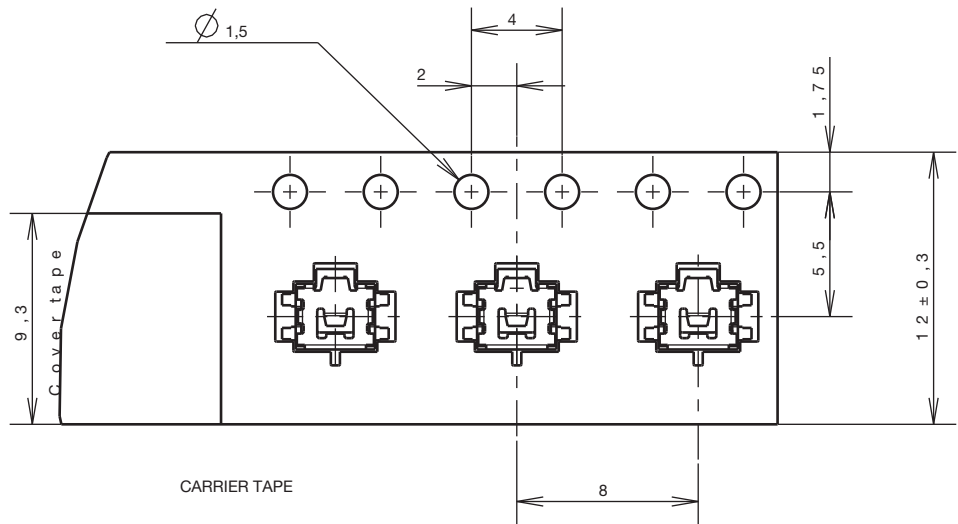
# PTS 840 Series Microminiature SMT Side Actuated

## TAPE & REEL



B

Tactile Switches



Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSR Series Subminiature Tact Switch for SMT

## Features/Benefits

- 4 actuation forces
- G terminations
- N.O. and N.C.
- Detect type available
- Rubber actuator
- IP50 sealed
- RoHS compliant and compatible

## Typical Applications

- Automotive
- Medical equipment
- Industrial electronics
- Smart meters



B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: Normally Open  
TERMINALS: Gullwing type for SMT

## Mechanical

Type	Operating force Newtons (grams)	Operating life (operations)	Travel (mm)
KSR211G LFS / KSR213G LFG	1,5 < 1,85 (185) < 2,2	100,000	0,25 ± 0,15
KSR221G LFS / KSR223G LFG	1,9 < 2,25 (225) < 2,6	100,000	0,3 ± 0,15
KSR231G LFS /KSR233G LFG	2,25 < 3,00 (300) < 3,75	100,000	0,35 ± 0,15
KSR251G LFS / KSR253G LFG	3,4 < 4,50 (450) < 5,6	100,000	0,5 ± 0,15
KSR221G NC LFS	1,5 < 2,25 (225) < 3	30,000	0,3 ± 0,15
KSR223G NC LFG	1,5 < 2 (200) < 2,5	30,000	0,3 ± 0,15

Overload: 20 Newtons  
Detect switch versions are available. Please see Detect chapter  
KSR2D/M series.

## Packaging

Switches are delivered on continuous tape, in reels of 2,500 pieces.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT DC:	50 mA	10 mA
MINIMUM CURRENT DC:	1 mA	1 mA

CONTACT RESISTANCE: ≤ 100 mΩ  
INSULATION RESISTANCE: (100 V): 1G Ω (between terminals)  
BOUNCE TIME: 1 ms max.

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

SOLDERING: Compatible with lead free reflow soldering process.

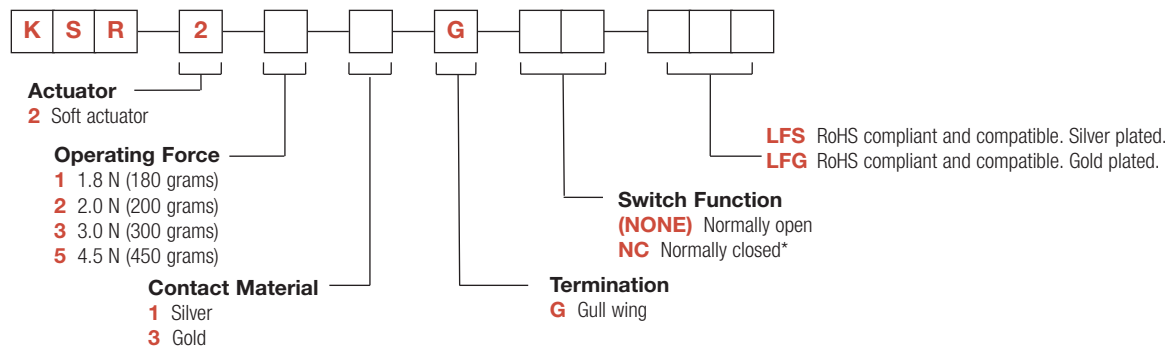
**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.



\*Available on KSR223G only.



Dimensions are shown: mm  
Specifications and dimensions subject to change

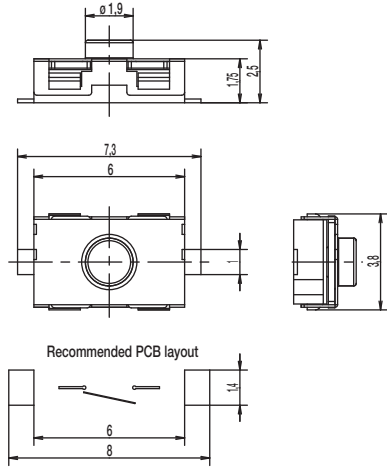
# KSR Series Subminiature Tact Switch for SMT

**KSR**

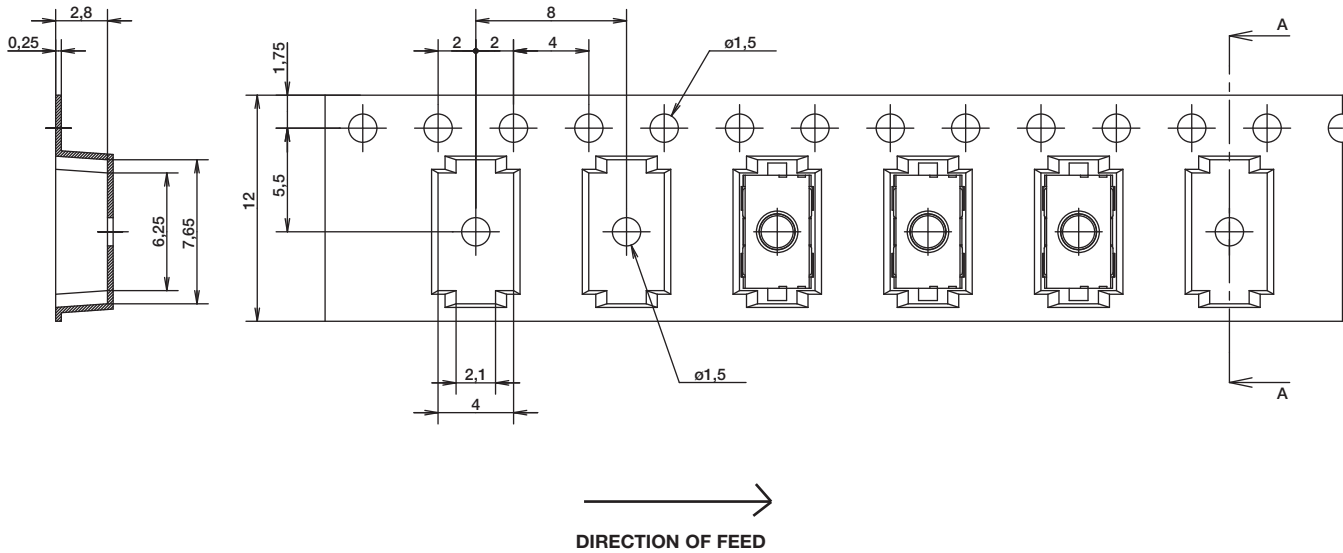


**B**

Tactile Switches



## TAPE & REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change



# KSR Long Life-200,000 cycles-Gold and Silver Series Subminiature Tact Switch for SMT

## Features/Benefits

- 4 actuation forces
- G terminations
- N.O.
- Detect type available
- Rubber actuator
- IP50 sealed
- RoHS compliant and compatible

## Typical Applications

- Automotive
- Medical equipment
- Industrial electronics



Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: Normally Open  
TERMINALS: Gullwing type for SMT

## Mechanical

Type	Operating force(Fa) Newtons (grams)	Operating life (operations)	Travel (mm)
<b>Silver versions</b>			
KSR212G LFS	1,5 < 1,85 (185) < 2,2	200,000	0,25 ± 0,15
KSR222G LFS	1,9 < 2,25 (225) < 2,6	200,000	0,3 ± 0,15
KSR232G LFS	2,25 < 3,00 (300) < 3,75	200,000	0,35 ± 0,15
KSR252G LFS	3,4 < 4,50 (450) < 5,6	200,000	0,5 ± 0,15
<b>Gold versions</b>			
KSR214G LFS	1,5 < 1,85 (185) < 2,2	200,000	0,25 ± 0,15
KSR224G LFS	1,9 < 2,25 (225) < 2,6	200,000	0,3 ± 0,15
KSR234G LFS	2,25 < 3,00 (300) < 3,75	200,000	0,35 ± 0,15
KSR254G LFS	3,4 < 4,50 (450) < 5,6	200,000	0,5 ± 0,15

OVERLOAD: 20 Newtons

## Packaging

Switches are delivered on continuous tape, in reels of 2,500 pieces.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 V dc	32 V dc
MINIMUM VOLTAGE:	20 m Vdc	20 m Vdc
MAXIMUM CURRENT DC:	50 mA	10 mA
MINIMUM CURRENT DC:	1 mA	1 mA

CONTACT RESISTANCE: ≤ 100 m Ω  
INSULATION RESISTANCE (100 V): 1 G Ω (between terminals)  
BOUNCE TIME: 1 ms max

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

SOLDERING: Compatible with lead free reflow soldering process.

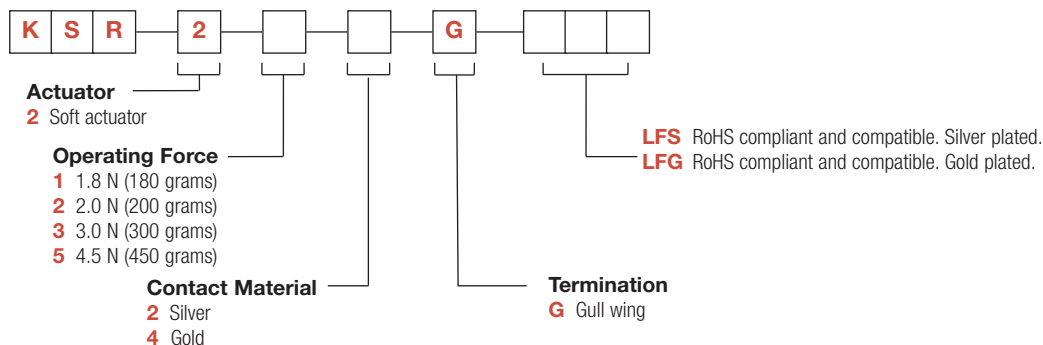
**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

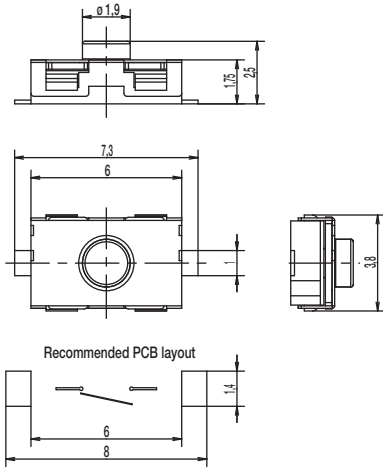
**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**

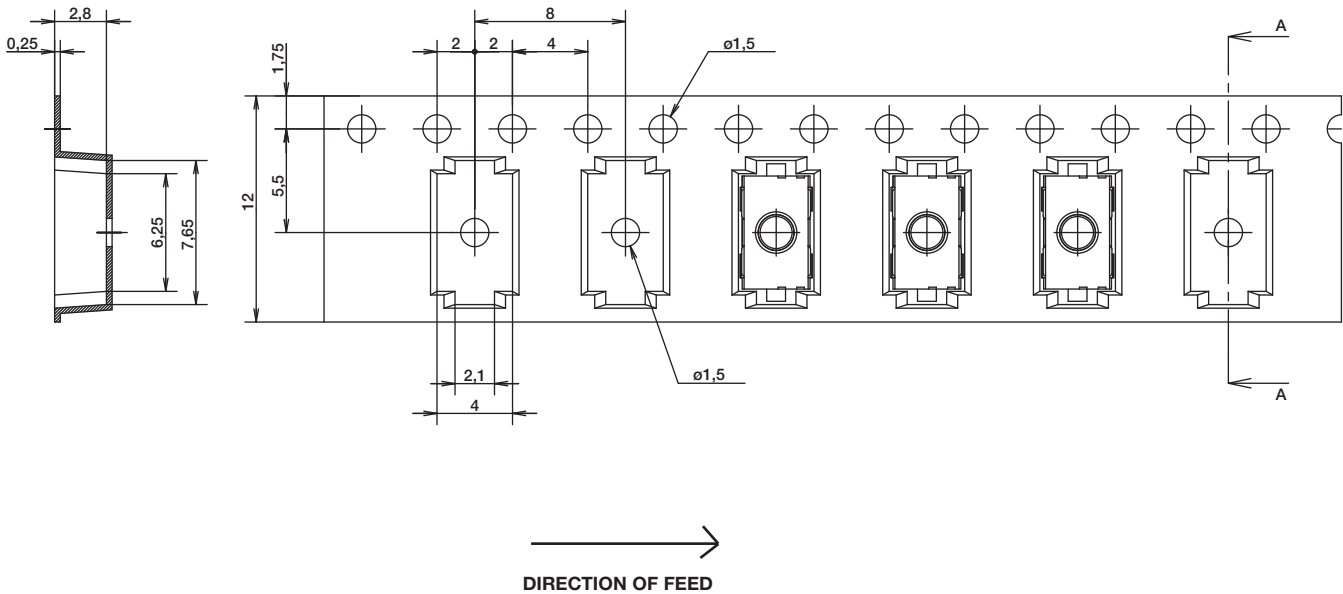


# KSR Long Life-200,000 cycles-Gold and Silver Series Subminiature Tact Switch for SMT

KSR



## TAPE & REEL



# KSS Series Subminiature SMT Side Actuated

## Features/Benefits

- Low profile of 1.7 mm
- Excellent tactile feel
- High shear force
- Range of actuation forces
- Large flat top
- RoHS compliant and compatible

## Typical Applications

- Cellular phone
- Industrial electronics
- Health diagnostic electronics



B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: N.O.  
TERMINALS: Gullwing  
IP40 sealed

## Mechanical

OVERLOAD: 20N  
TACTILE FEELING: 2 and 4N: 25% min.  
2.5N: 30% min.

Type	Operating force Newtons (grams)	Operating life (operations)	Travel (mm)
KSS221G	2.0 (200) ± 0.5	100,000	0,3 ± 0,15
KSS231G	2.5 (250) ± 0.5	100,000	0,3 ± 0,10
KSS241G	4.0 (400) ± 1.0	100,000	0,3 ± 0,15

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	1 mA
DIELECTRIC STRENGTH: ≥ 250 VDC		
CONTACT RESISTANCE: < 100 mΩ		
INSULATION RESISTANCE (100 VDC): ≥ 10 <sup>9</sup> Ω		
BOUNCE TIME: < 3 ms		

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

Infrared reflow soldering in accordance with IEC 61760-1

## Packaging

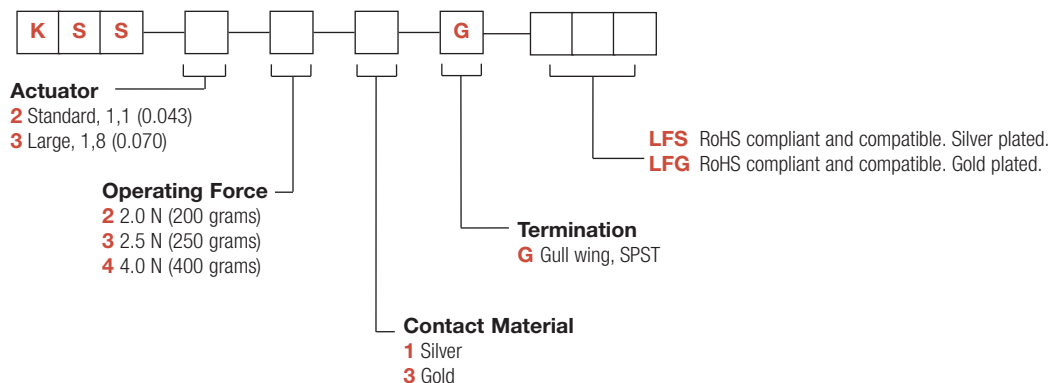
Tape and reels in reels of 3,000 pieces.  
External diameter 330mm ± 2mm.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**

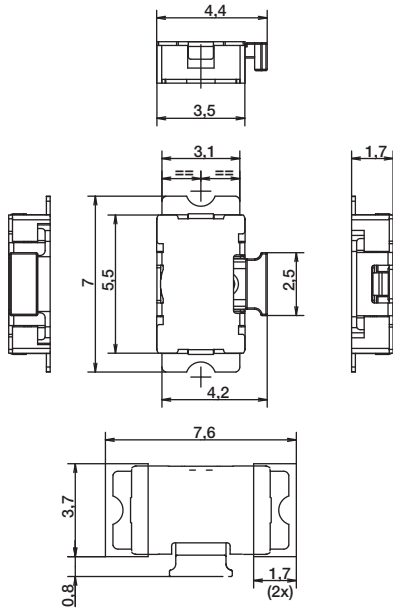


# KSS Series Subminiature SMT Side Actuated

KSS

B

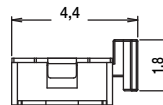
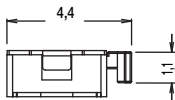
Tactile Switches



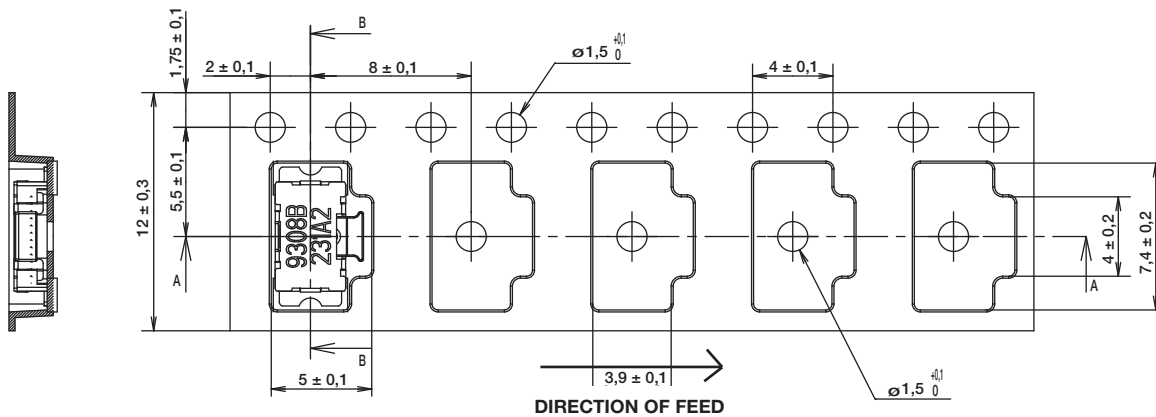
## ACTUATOR

2 STANDARD, 1,1 (0.043)

3 LARGE, 1,8 (0.070)



## TAPE & REEL



Dimensions are shown: mm  
Specifications and dimensions subject to change

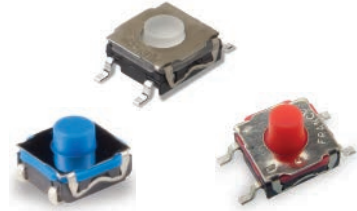
# KSC Series Sealed Tact Switch for SMT

## Features/Benefits

- Positive tactile feeling
- J or G terminations
- Various heights
- IP67

## Typical Applications

- Automotive
- Cellular phones
- Industrial electronics
- Network infrastructure and IT
- Elevator



## Specification

FUNCTION: Momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 TERMINALS: J bend & Gullwing type for SMT  
 SEALING: IP67 except KSC5 (IP50)

## Liability Limitation

This datasheet does not provide enough information for applications that require a certain level of quality or safety such as automotive, medical systems, or safety equipment. Please contact customer service for the contractual specification package.

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

- SOLDERING: Depending on the application, this component is suited to the following methods:
- Terminals being silver or gold plated over a nickel barrier, the use of slightly activated flux is suitable.
  - Soldering on double wave machine for vertical versions: soldering time ≤ 5 sec.
  - Cleaning according to typical washing processes.
  - Infrared Reflow Soldering in accordance with IEC 61760-1.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	0.1 mA

DIELECTRIC STRENGTH (50 Hz, 1 min.): ≥ 250 Vrms  
 CONTACT RESISTANCE: ≤ 100mΩ  
 INSULATION RESISTANCE (100 V): ≥ 10M Ω  
 BOUNCE TIME: ≤ 1 ms

\* Ultra low current with 10 µA - 1 VDC version are available upon request for KSC2 and KSC4

## Packaging

Tape and Reel (see series for quantity information)

**NOTE:** Specifications listed above are for switches with standard options.

## KSC Product Range

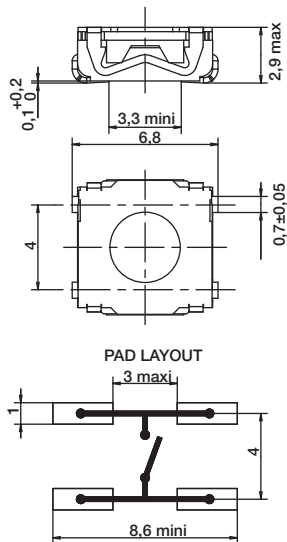
KSC1	KSC2	KSC3	KSC4	KSC5	KSC6	KSC7	KSC8	KSC9	KSC10
Without actuator	Soft actuator	Hard actuator	Soft actuator	Hard actuator	Hard actuator	Soft actuator	Hard actuator	Hard actuator	Soft actuator
H = 2.5 mm	H = 3.5 mm	H = 3.5 mm	H = 5.2 mm	H = 5.6 mm	H = 7.7 mm	H = 4.3 mm	H = 4.9 mm	H = 7.7 mm compatible with button	H = 4.9 mm
IP67	IP67	IP67	IP67	IP50	IP67	IP67	IP67	IP67	IP67



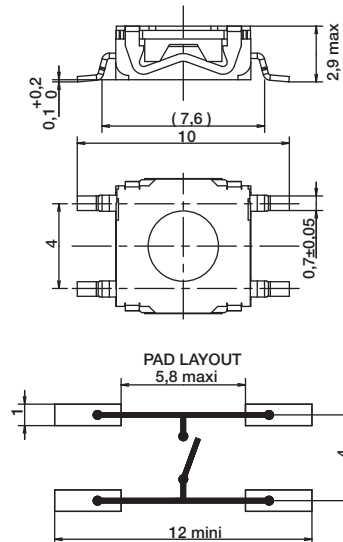
Note: KSC Series is subject to variants. Please contact customer service for other options.

# KSC Series Sealed Tact Switch for SMT

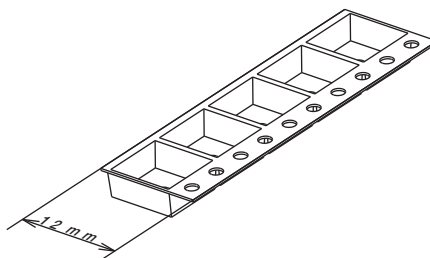
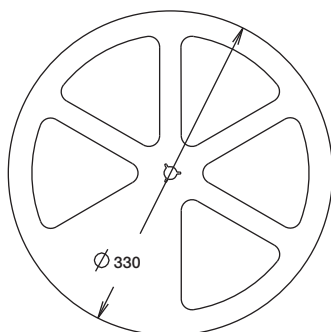
## J BEND



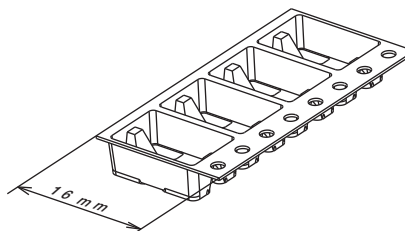
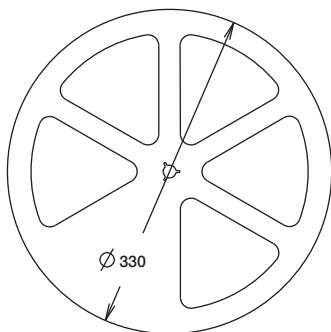
## G GULLWING



### 12 MM



### 16 MM



12 mm	Pieces	16 mm	Pieces
KSC1J	2,000	KSC1G	2,000
KSC2J	2,000	KSC2G	2,000
KSC3J	2,000	KSC3G	2,000
		KSC4J & G	1,000
		KSC5J & G	1,000
		KSC6J & G	750
		KSC7J & G	1,000
		KSC8J & G	1,000
		KSC9J & G	750
		KSC10J & G	1,000



First Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSC1 Series Sealed Tact Switch for SMT

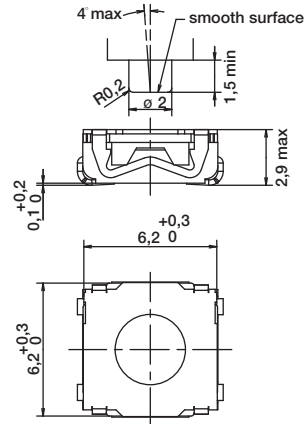
## KSC1 without actuator 2,5 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC121	1.8 ± 0.65	200,000	0.3 ± 0.15
KSC141	3 ± 0.75	200,000	0.3 ± 0.15
KSC151	5.5 ± 1.4	100,000	0.35 ± 0.15

### Packaging

Switches delivered on continuous tape & reels of 2,000 pieces  
 Dimensions according to EIA RS-481/ IEC 60286-3 standard  
 External diameter 330 ± 2 mm



B

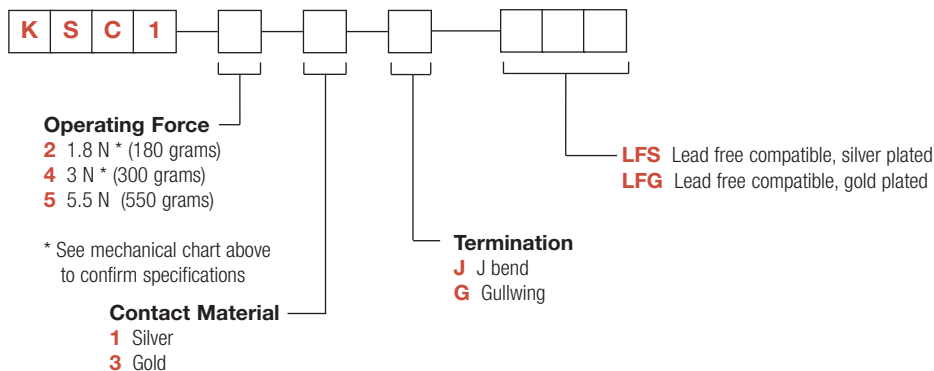
Tactile Switches

### How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**



# KSC2 Series Sealed Tact Switch for SMT

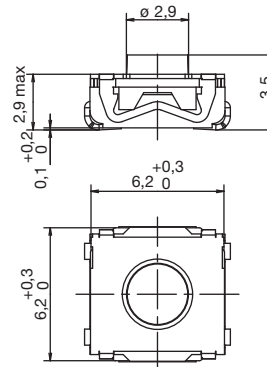
## KSC2 soft actuator 3,5 mm high



B

Tactile Switches

Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC201	1.6 ± 0.6	5,000,000	0.3 ± 0.2
KSC221	2 ± 0.5	500,000	0.35 + 0.3/- 0.1
KSC222	2 ± 0.5	1,000,000	0.35 ± 0.15
KSC241	3.5 ± 0.9	300,000	0.5 ± 0.2
KSC251	5.55 ± 1.45	300,000	0.5 ± 0.2
KSC231 SPD	3.5 ± 0.9	300,000	0.5 ± 0.2
KSC241 SPD	3.55 ± 0.9	300,000	0.5 ± 0.2
KSC251 SPD	6.2 ± 1.55	100,000	0.6 ± 0.2



### Packaging

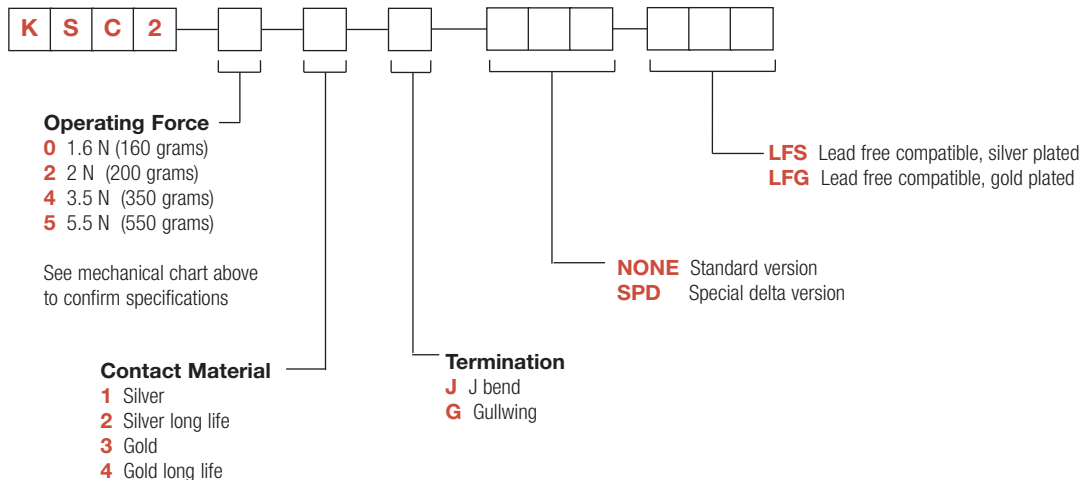
Switches delivered on continuous tape & reels of 2,000 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

### How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.



Dimensions are shown: mm  
Specifications and dimensions subject to change

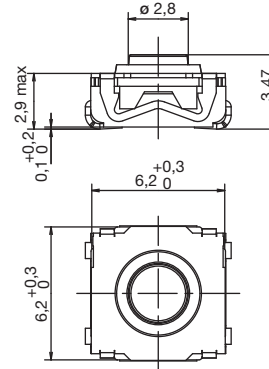


# KSC3 Series Sealed Tact Switch for SMT

## KSC3 hard actuator 3,5 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC321	2 ± 0.4	300,000	0.2 + 0.3/- 0
KSC341	3 ± 0.75	300,000	0.2 + 0.3/- 0
KSC351	5 ± 1	100,000	0.25 + 0.3/- 0



## Packaging

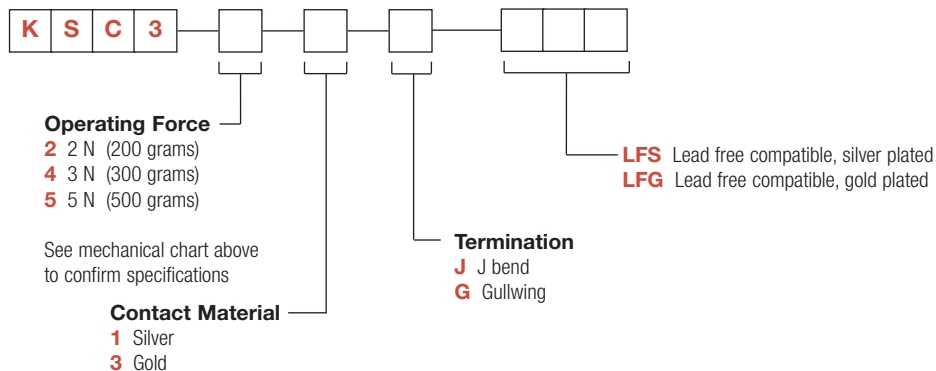
Switches delivered on continuous tape & reels of 2,000 pieces  
 Dimensions according to EIA RS-481/ IEC 60286-3 standard  
 External diameter 330 ± 2 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**



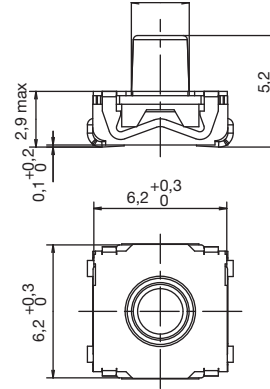
# KSC4 Series Sealed Tact Switch for SMT

KSC4 soft actuator 5,2 mm high



Tactile Switches

Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC401 50SH	1.45 ± 0.55	5,000,000	0.5 ± 0.25
KSC411 70SH	1.4 ± 0.35	1,000,000	0.35 ± 0.20
KSC421 70SH	1.7 ± 0.45	300,000	0.5 ± 0.25
KSC422 70SH	1.7 ± 0.45	1,000,000	0.5 ± 0.25
KSC441 70SH	4 ± 1	300,000	0.75 ± 0.25
KSC442 70SH	4 ± 1	1,000,000	0.75 ± 0.25
KSC451 70SH	4.25 ± 0.75	300,000	0.8 ± 0.2
KSC441 SPD	3.5 ± 0.9	300,000	0.7 ± 0.2
KSC441 ST1	3.4 ± 1	300,000	0.7 ± 0.25
KSC441 ST2	3.4 ± 1	300,000	0.35 ± 0.20
KSC461 ST1	6.25 ± 1.75	100,000	1 ± 0.3
KSC461 ST2	6.25 ± 1.75	300,000	0.5 ± 0.2



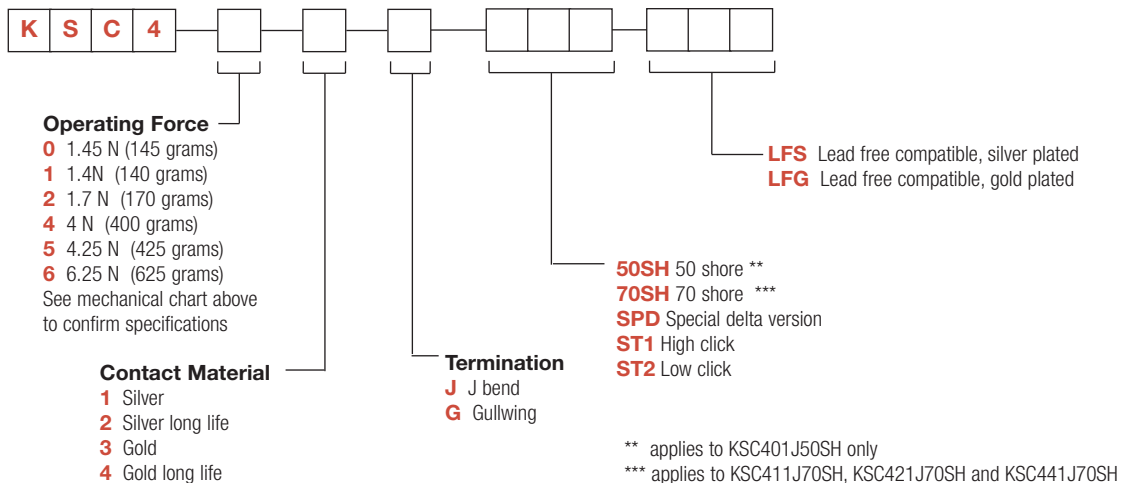
## Packaging

Switches delivered on continuous tape & reels of 1,000 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.  
For any part number different from those listed above, please consult your local representative.



Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSC5 Series Tact Switch with Rocker Option for SMT

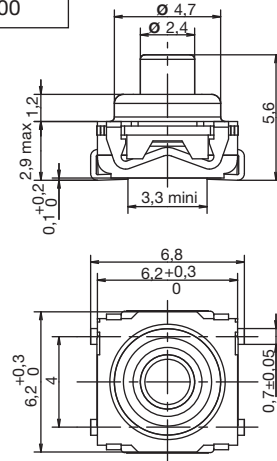
KSC5 hard actuator 5,6 mm high



Type	Operating force axial FA N (grams)	Operating force lateral FL N (grams) ±30%	Travel to make axial (mm)	Travel to make lateral (mm)	Life expectancy cycles, axial	Life expectancy cycles, lateral
KSC521	2 ± 0.5	1.2 - 2.6	0.25 ± 0.15	0.5 ± 0.25	100,000	10,000
KSC541	3 ± 0.75	1.8 - 3.8	0.25 ± 0.15	0.5 ± 0.25	100,000	10,000

## Packaging

Switches delivered on continuous tape & reels of 1,000 pieces, dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

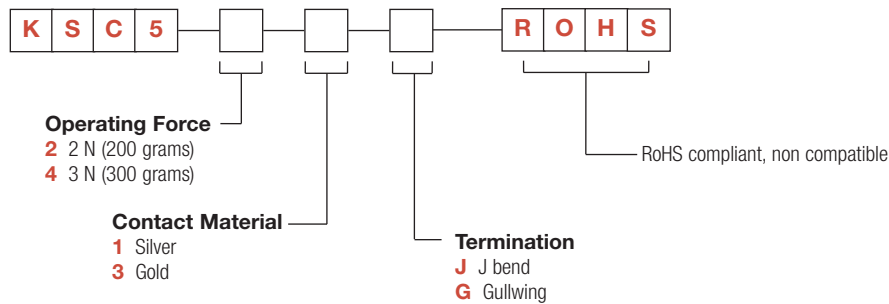


## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.

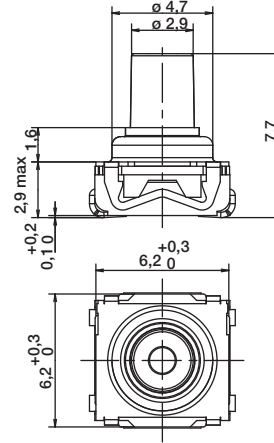


# KSC6 Series Sealed Tact Switch for SMT

KSC6 hard actuator 7,7 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC621	1.7 ± 0.5	300,000	0.4 ± 0.2
KSC631	2.55 ± 0.65	300,000	0.4 ± 0.2
KSC641	3.4 ± 0.85	300,000	0.4 ± 0.2



Tactile Switches

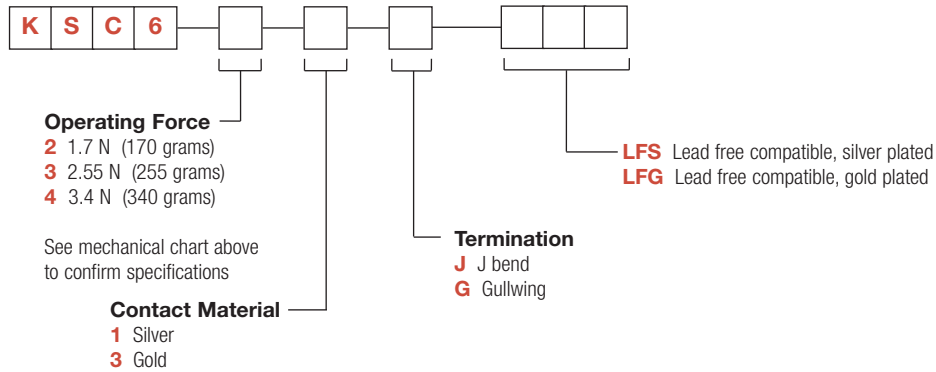
## Packaging

Switches delivered on continuous tape & reels of 750 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**  
**For any part number different from those listed above, please consult your local representative.**



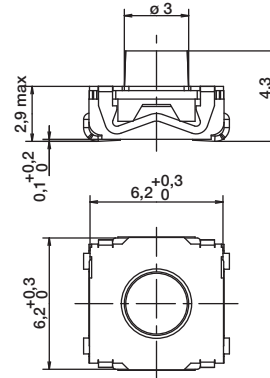
Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSC7 Series Tact Switch with Rocker Option for SMT

## KSC7 soft actuator 4,3 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC701	1.6 ± 0.6	5,000,000	0.3 ± 0.2
KSC721	2.25 ± 0.55	300,000	0.3 ± 0.15
KSC741	3.9 ± 1	300,000	0.4 ± 0.2



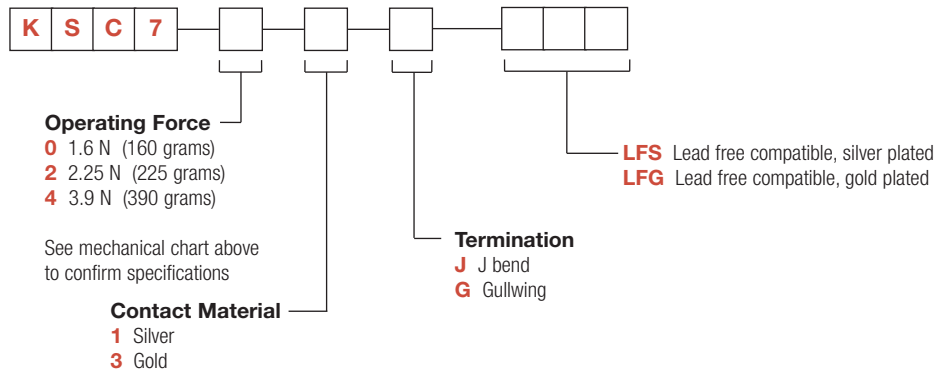
## Packaging

Switches delivered on continuous tape & reels of 1,000 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.  
For any part number different from those listed above, please consult your local representative.**



# KSC8 Series Sealed Tact Switch for SMT

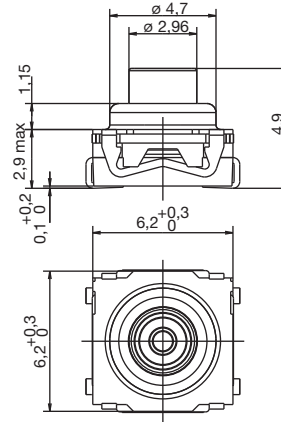
KSC8 hard actuator 4,9 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC821	3.15 ± 0.75	300,000	0.65 ± 0.2
KSC821 OL	1.7 ± 0.5	300,000	0.4 ± 0.2
KSC831 OL	2.55 ± 0.65	300,000	0.4 ± 0.2
KSC841 OL	3.4 ± 0.85	300,000	0.4 ± 0.2

## Packaging

Switches delivered on continuous tape & reels of 1,000 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm



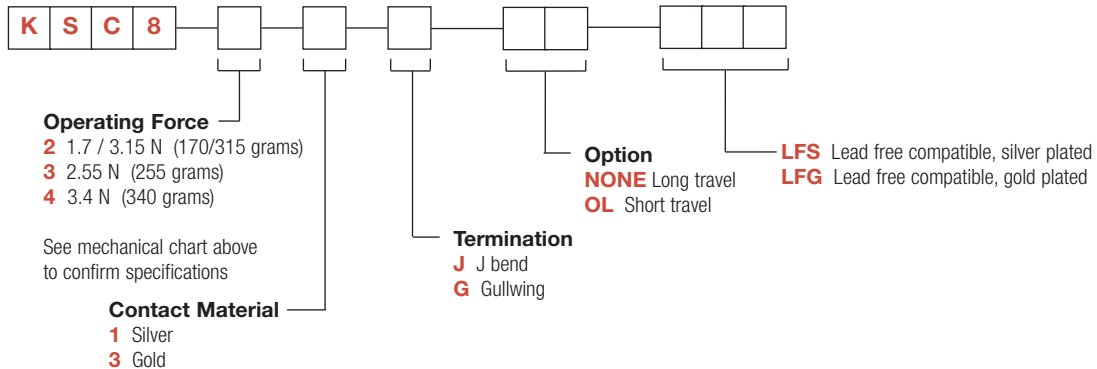
Tactile Switches

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.



Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSC9 Series Sealed Tact Switches for SMT

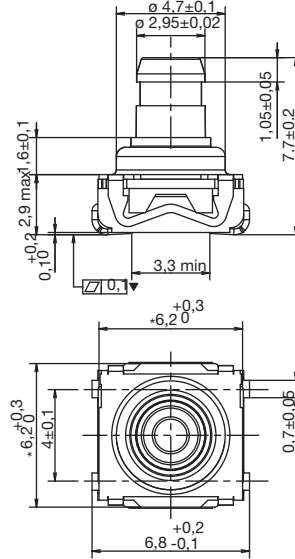
## KSC9 hard actuator 7,7 mm high



Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC921	1.7 ± 0.5	300,000	0.4 ± 0.2
KSC931	2.25 ± 0.65	300,000	0.4 ± 0.2
KSC941	3.4 ± 0.85	300,000	0.4 ± 0.2

### Packaging

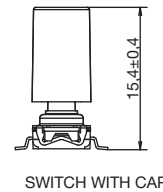
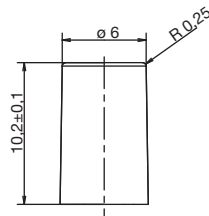
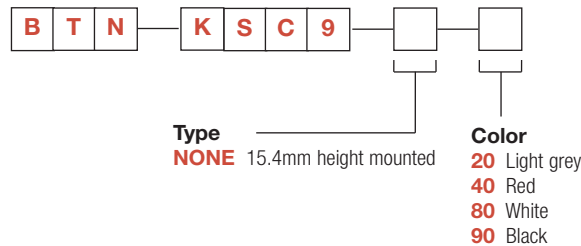
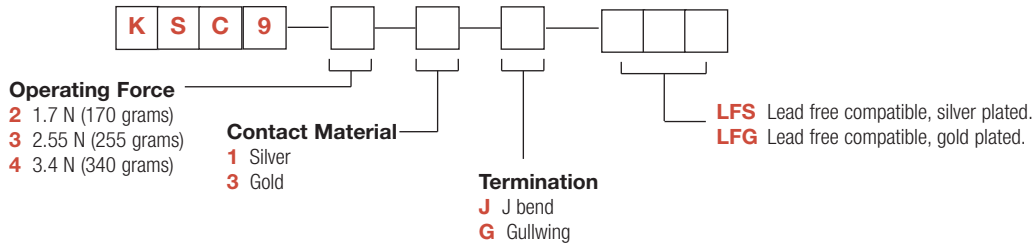
Switches delivered on continuous tape & reels of 750 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm



### How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**For any part number different from those listed above, please consult your local representative.**



Dimensions are shown: mm  
Specifications and dimensions subject to change

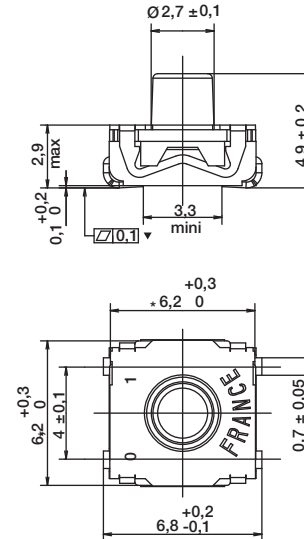
# KSC10 Series Sealed Tact Switches for SMT

KSC10 soft actuator 4,9 mm high



Tactile Switches

Type	Operating force FA (Newtons)	Operating life (operations)	Travel (mm)
KSC1001	1.45 ± 0.55	5,000,000	0.45 ± 0.25



## Packaging

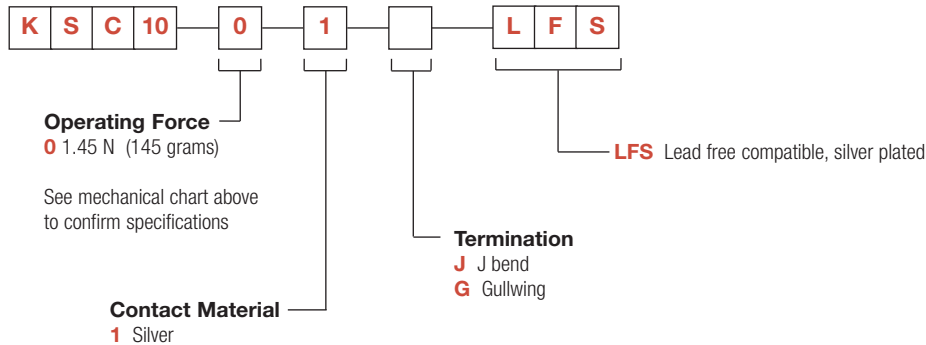
Switches delivered on continuous tape & reels of 1,000 pieces  
Dimensions according to EIA RS-481/ IEC 60286-3 standard  
External diameter 330 ± 2 mm

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**



Note: KSC10 offered with yellow actuator as standard, hardness 55 Shore



# KSC4V2 Series Side Actuated Sealed Tact Switch

## Features/Benefits

- Full SMD side actuated
- Haptic adaptability
- Pin in paste terminations
- Tape & reel
- IP67

## Typical Applications

- Automotive
- Industrial electronics
- Network equipment
- Telecommunications



## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS:  
2 pin in paste signal terminals  
3 SMD ground terminals

## Mechanical

Type	Force (N)	Operating Life (operations)	Travel (mm)
KSC441V2SPDLFS	3.5 ± 1.0	300,000	0.7 ± 0.2
KSC421V270SHLFS	1.55 ± 0.45	300,000	0.5 ± 0.2

NOTE: Basic version is based on KSC441V2 SPDELTA LFS.  
Other configurations of haptics are available upon demand.

MISUSE OVERLOAD: 40N with back support  
SHEAR FORCE: 10N without back support

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	0.1 mA

DIELECTRIC STRENGTH (50 Hz, 1 min.): ≥ 250 Vrms  
CONTACT RESISTANCE: ≤ 100 mΩ  
INSULATION RESISTANCE (100 V, initial stage): > 10<sup>9</sup> Ω  
BOUNCE TIME: < 1 ms

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

## Process

SOLDERING: Depending on the application, this component is suited to the following methods:

- Cleaning according to typical washing processes.
- Infrared Reflow Soldering in accordance with IEC 61760-1.

TERMINALS: pin in paste, silver or gold plated

TOP PLATE: tin plated

MSL level: 1

Vacuum pick head mandatory

## Packaging

In reels of 500 pieces.

Dimensions of reels according to EIA RS481 or IEC 2863.

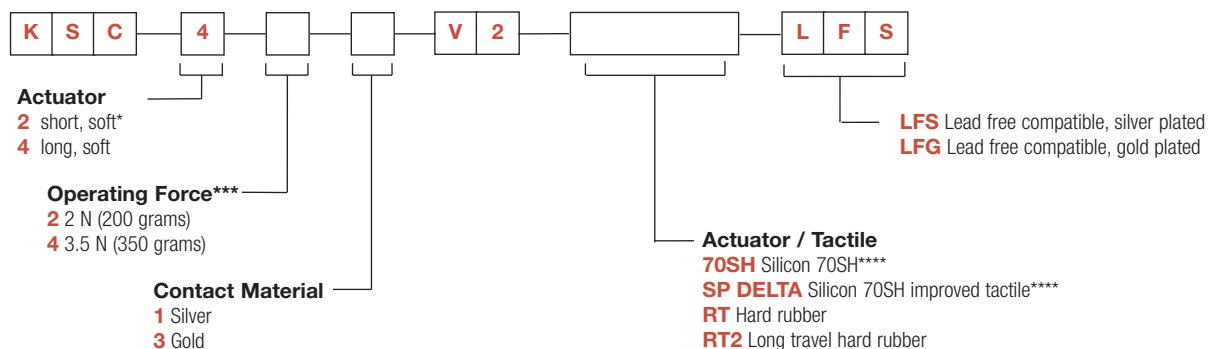
External diameter 330 mm ± 2 mm.

NOTE: This product is designed and manufactured for general electronic devices.  
For systems where reliability and safety are required, please contact your sales representative to secure product integration and function to secure usage.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**For any part number different from those listed above, please consult your local representative.**



\* KSC2 version available upon demand

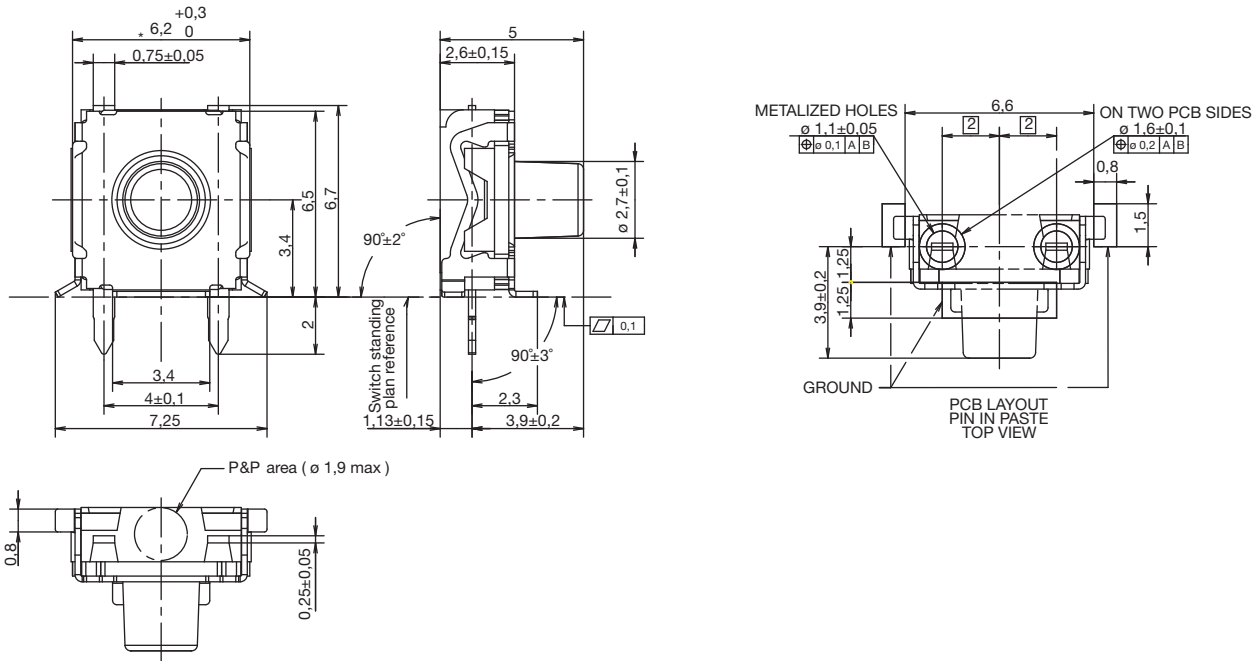
\*\*\* Force available upon demand (variant version)

\*\*\*\* Available for KSC4 only

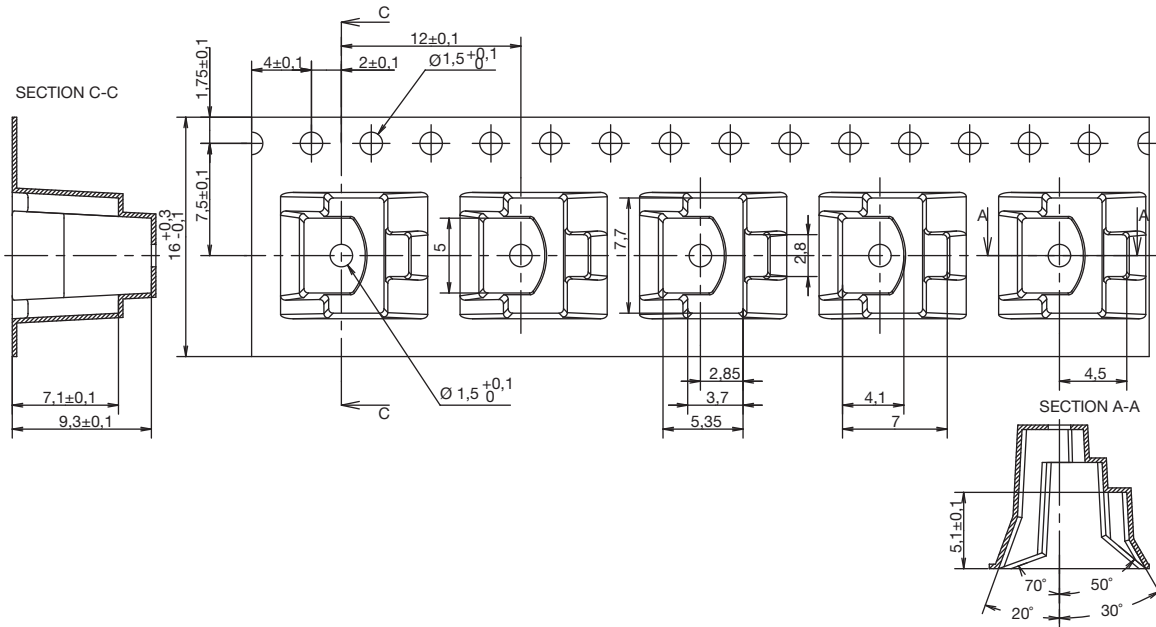
# KSC4V2 Series Side Actuated Sealed Tact Switch

Tactile Switches

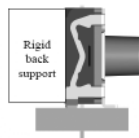
B



## TAPE AND REEL



## INTEGRATION



First Angle  
Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change

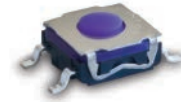
# KSE Series Low Profile Tact Switch

## Features/Benefits

- Low profile
- Cost efficient
- J or G terminations
- Tape and reel
- IP67

## Typical Applications

- Smart meters
- Home appliances
- Consumer electronics
- Industrial electronics
- Telecommunications



## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: J bend & Gullwing type for SMT

## Mechanical

Type	Operating Force FA (Newtons)		Operating Life Operations	Travel (mm)
	Min.	Max.		
KSEM31JLFS	1,6 ± 0,6		300,000	0,3 + 0,1/-0,2
KSEM31GLFS	1,6 ± 0,6		300,000	0,3 + 0,1/-0,2
KSEK43JLFS	2,25 ± 0,75		300,000	0,3 ± 0,2
KSEK43GLFS	2,25 ± 0,75		300,000	0,3 ± 0,2

NOTE: For cost effectiveness the tactile feeling is not specified and can change along production. If your application requires a defined tactile effect, please consider KSC series for your application.

## Packaging

In reels of 2,000 pieces  
Dimensions of reels according to EIA RS481 or IEC 2863.  
External diameter 330 mm ± 2 mm.

## Electrical

MAXIMUM POWER: 1 VA  
MINIMUM/MAXIMUM VOLTAGE: 20 mV / 32 VDC  
MINIMUM/MAXIMUM CURRENT: 1 mA / 50 mA  
DIELECTRIC STRENGTH: (50 Hz, 1 min.): ≥ 250 V  
CONTACT RESISTANCE: ≤ 100 mΩ  
INSULATION RESISTANCE: (100 V): ≥ 10<sup>9</sup> Ω  
BOUNCE TIME: ≤ 1 ms

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C  
STORAGE TEMPERATURE: -55°C to 85°C

## Process

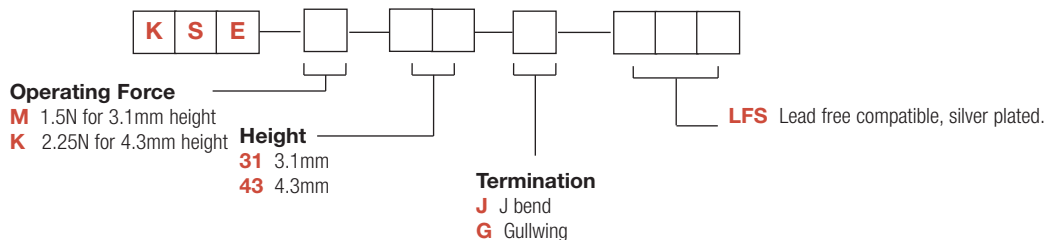
SOLDERING: Depending on the application, this component is suited to the following methods:  
– Cleaning according to typical washing processes.  
– Infrared Reflow Soldering in accordance with IEC 61760-1.

## NOTE:

Specifications listed above are for switches with standard options. KSE series is not subject to adaptation and/or modification for specific use. If you require additional features, please refer to the KSC series. KSE is not recommended for applications requiring high level of performance such as aerospace, automotive and some industrial applications.

## How To Order

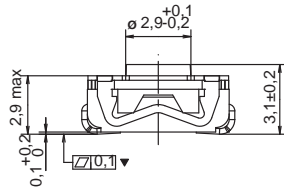
Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



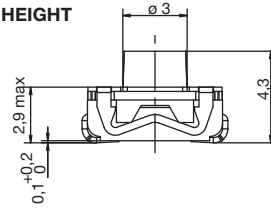
# KSE Series Low Profile Tact Switch

## HEIGHT

**31** 3.1 MM HEIGHT

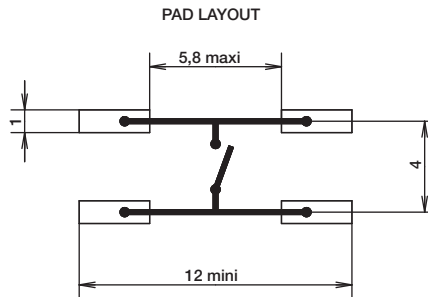
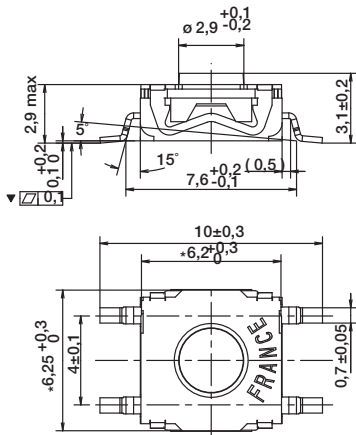


**43** 4.3 MM HEIGHT

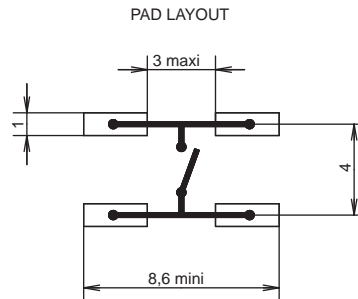
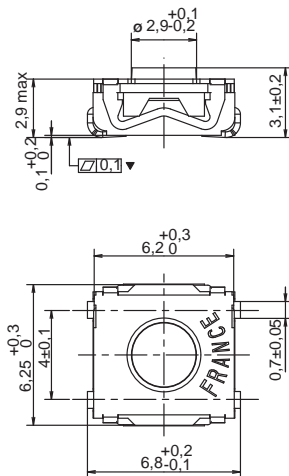


## TERMINATION

**G** GULLWING



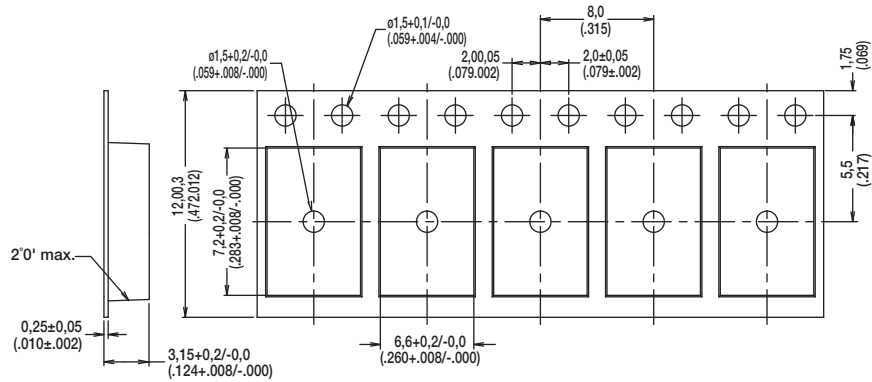
**J** J BEND



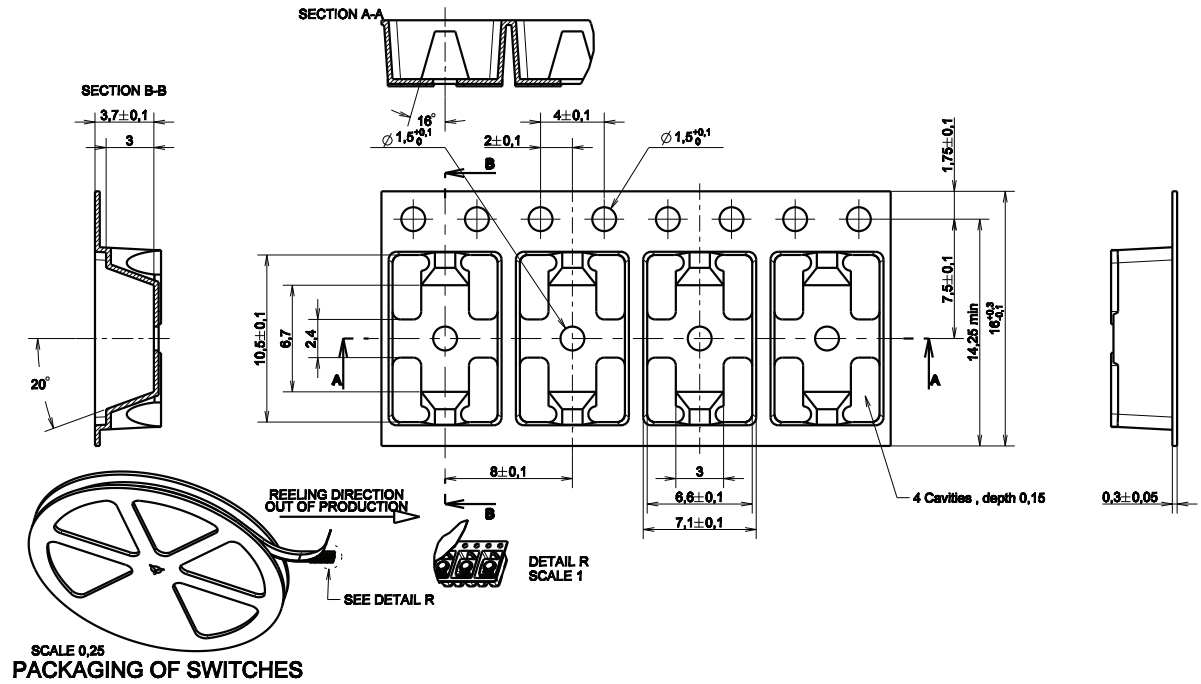
# KSE Series Low Profile Tact Switch

## TAPE & REEL

### 12 mm height



### 16 mm height



B  
Tactile Switches

# KT Series

## Full SMT Top & Side Actuated Sealed Tact Switch



### Features/Benefits

- Full SMT side-actuated tact switch
- SMT top-actuated tact switch with G or J terminations
- High shear force with extended bracket
- Easy to pick & place with top plate tab
- Rubber or hard plastic actuator
- Press fit or snap fit caps
- RoHS compliant and compatible

### Typical Applications

- Telecommunications
- Computer products
- Instrumentation
- Power supply

### Specification

CONTACT ARRANGEMENT: SPST, N.O.  
TERMINALS: SMT termination

### Electrical

CONTACT RATING: 1.0 VA max. @ 32 V AC or DC max.  
ELECTRICAL & MECHANICAL LIFE: 100,000 make-and-break cycles at full load.  
DIELECTRIC STRENGTH: 250 Vrms min. @ sea level.  
CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA.  
INSULATION RESISTANCE: 10<sup>9</sup> Ω min.

### Environmental

OPERATING TEMPERATURES: Ag version: -40°C to 90°C  
Au version: -40°C to 125°C

### Process

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).  
DEGREE OF PROTECTION: IP57; protection against harmful dust deposits, full-scale voltage protection.

### Packaging

Switches supplied in anti-static tape and reels per EIA 481-2. Tape and cover strip are conductive for use near statically sensitive components.

**NOTE:** Specifications listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

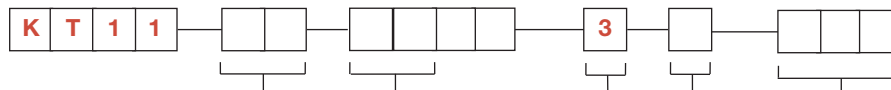
### How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

For any part number different from those listed above, please consult your local representative.

### SWITCH



#### Actuator

- B0\*** Soft, flush
- B1\*** Soft, 0,64 mm
- B2\*** Soft, 2,24 mm
- P2\*\*** Hard, 2,36 mm
- P3\*\*** Hard, 1,12 mm
- P4\*\*** Hard, 3,96 mm
- S1\*\*\*** ø0,1" for Press Fit Caps
- S2\*\*\*** ø0,14" for Snap Fit Caps (with anti-rotation)

#### Orientation and Mounting Style

- SM** Top Gullwing
- JM** Top J Bend \*\*\*\*
- SAM** Right angle
- SA1M** Right angle with front solder pad
- SA2M** Right angle with front solder pad and pick & place tab
- SA3M** Right angle with pick & place tab

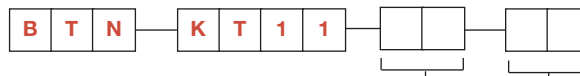
#### Contact Plating

- 4** Silver
- 5** Gold
- LFS** RoHS compliant and compatible. Silver plated
- LFG** RoHS compliant and compatible. Gold plated

\* B0, B1 & B2 available with A, A1 & A3 mounting bracket only.  
\*\* P2, P3, P4 actuators suitable with A1 & A2 mounting bracket only.  
\*\*\* S1 & S2 available with A1 & A2 mounting bracket only.  
\*\*\*\* JM available with B0, B1, B2, P2, P3, P4 without mounting bracket.

### BUTTON

To order buttons in bulk



#### Button Style

- 02** Press fit
- 03** Snap fit, high temperature

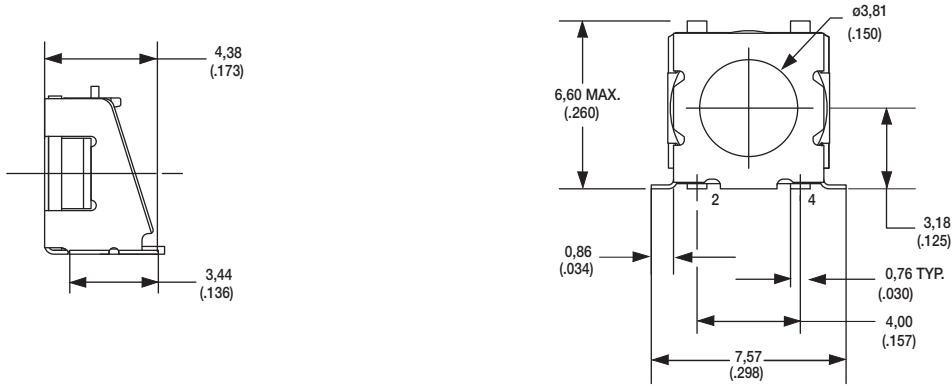
#### Button Color

- 90** Black
- 80** Ivory (natural)
- 40** Red

# KT Series Full SMT Top & Side Actuated Sealed Tact Switch

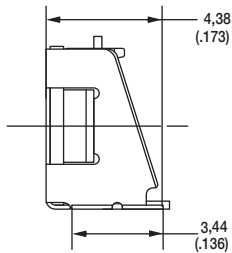
## SERIES

**KT11**

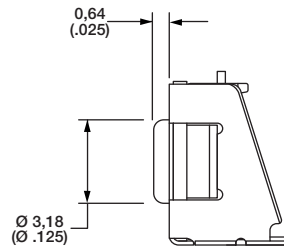


## ACTUATOR

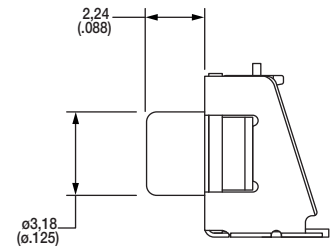
**B0 SOFT, FLUSH\***



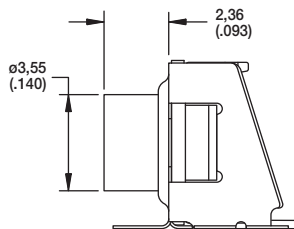
**B1 SOFT, 0,64 mm\***



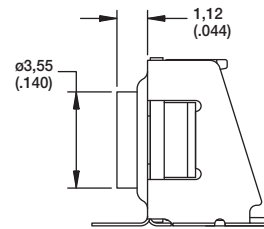
**B2 SOFT, 2,24 mm\***



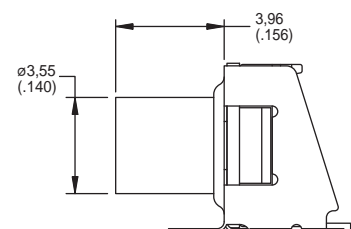
**P2 HARD, 2,36 mm**



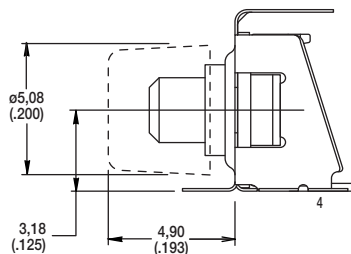
**P3 HARD, 1,12 mm**



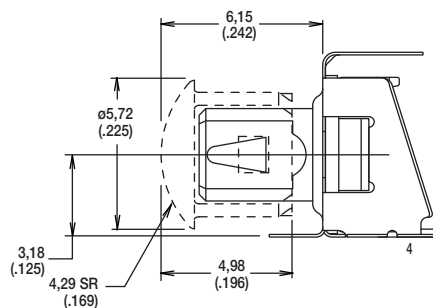
**P4 HARD, 3,96 mm\*\***



**S1  $\phi 0,1$ " FOR PRESS FIT CAPS\*\*\***



**S2  $\phi 0,14$ " FOR SNAP FIT CAPS\*\*\***



\* B0, B1 & B2 available with A, A1 & A3 mounting bracket only.

\*\* P2, P3, P4 actuators suitable with A1 & A2 mounting bracket only.

\*\*\* S1 & S2 available with A1 & A2 mounting bracket only.

\*\*\*\* JM available with B0, B1, B2, P2, P3, P4 without mounting bracket.



Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

**B**

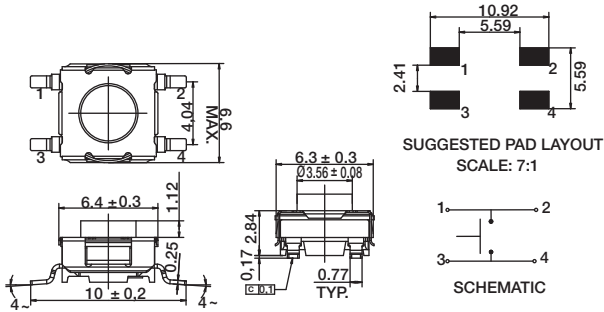
Tactile Switches

# KT Series Full SMT Top & Side Actuated Sealed Tact Switch

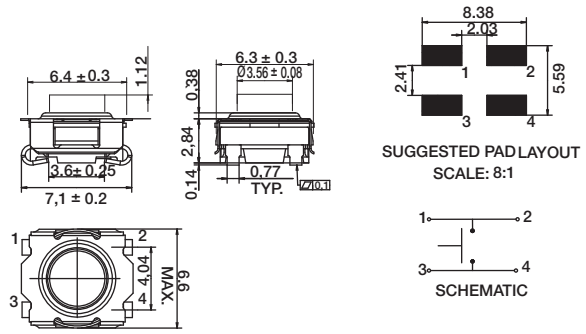
## ORIENTATION & MOUNTING STYLE

Tactile Switches

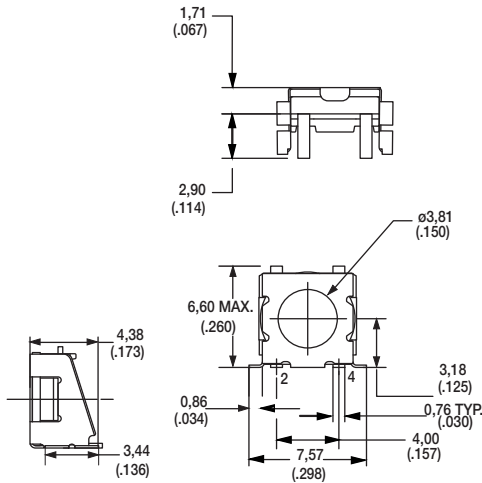
### SM TOP GULLWING



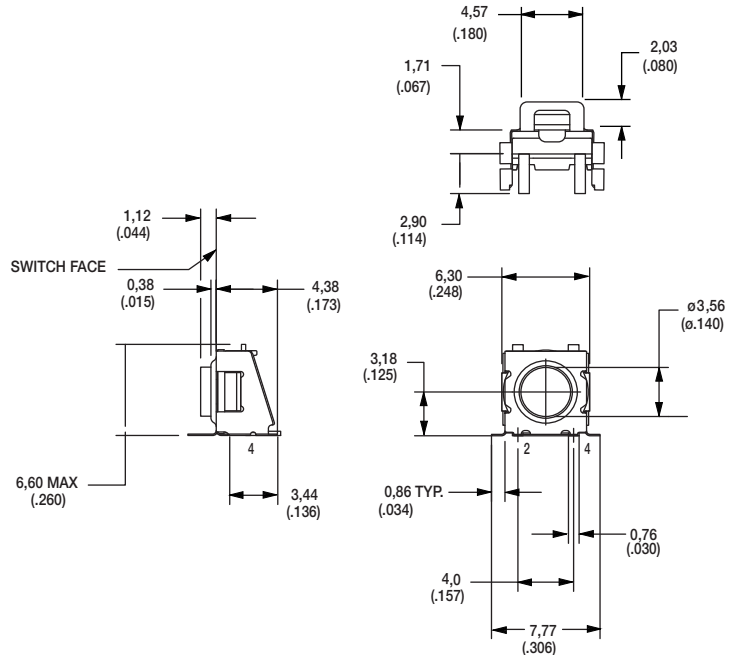
### JM TOP J BEND



### SAM RIGHT ANGLE



### SA1M RIGHT ANGLE WITH FRONT SOLDER PAD



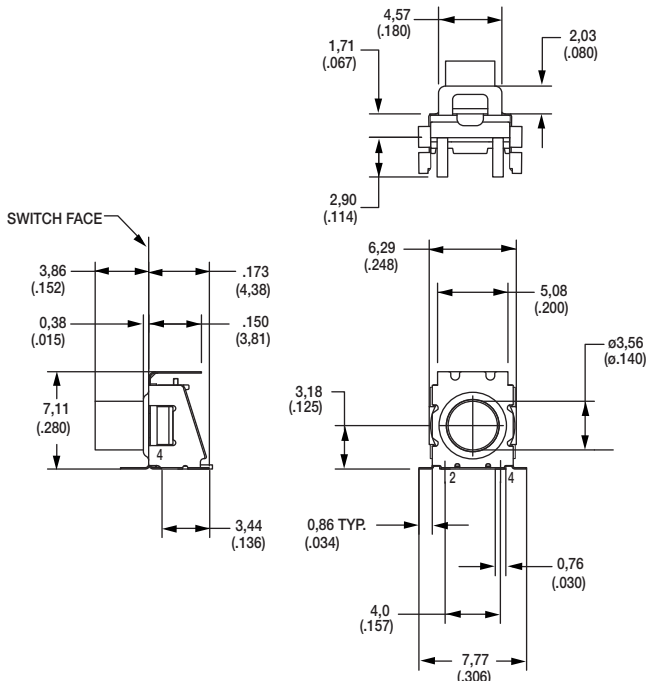
Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change



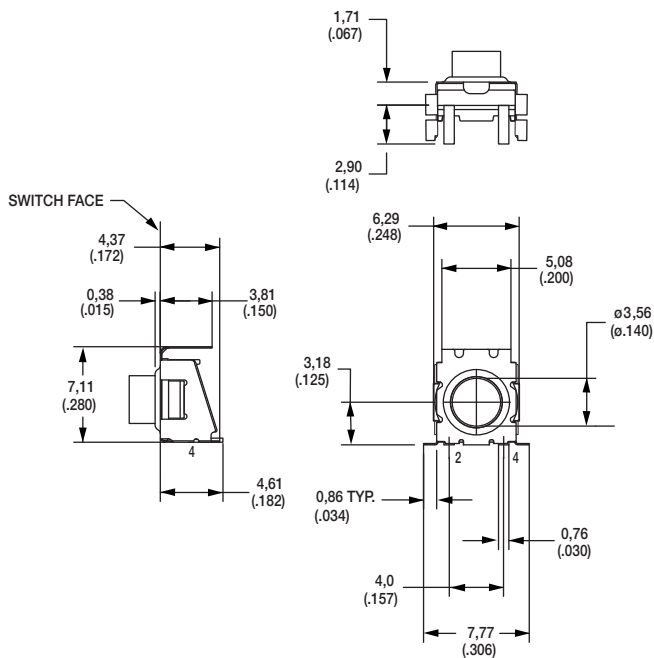


# KT Series Full SMT Top & Side Actuated Sealed Tact Switch

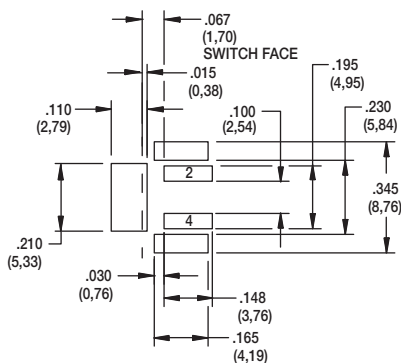
## SA2M RIGHT ANGLE WITH FRONT SOLDER PAD AND PICK & PLACE TAB



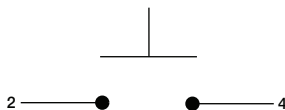
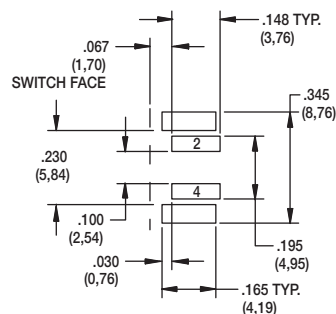
## SA3M RIGHT ANGLE WITH PICK & PLACE TAB



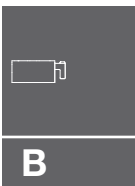
### PAD LAYOUT SA1M & SA2M MOUNTING BRACKET



### PAD LAYOUT SAM & SA3M MOUNTING BRACKET



SCHEMATIC



Tactile Switches



Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

# KT Series Full SMT Top & Side Actuated Sealed Tact Switch

## BUTTON

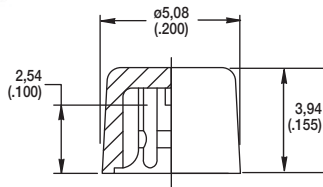
### BUTTON

To order buttons in bulk

#### 02 PRESS FIT

PART NUMBER	Internal Part Number	Button Color
<b>BTN KT11 02 80</b>	5081 01000	Ivory (Natural)
<b>BTN KT11 02 90</b>	5081 02000	Black
<b>BTN KT11 02 40</b>	5081 03000	Red

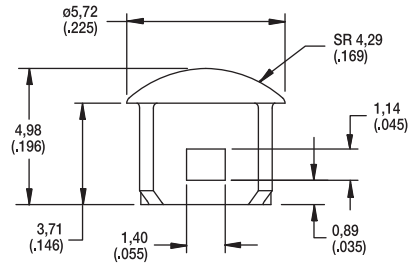
Materials: Nylon  
Finish: Gloss



#### 03 SNAP FIT, HIGH TEMPERATURE

PART NUMBER	Internal Part Number	Button Color
<b>BTN KT11 03 80</b>	685B 01000	Ivory (Natural)
<b>BTN KT11 03 90</b>	685B 02000	Black

Materials: Nylon  
Finish: Gloss



# K5AT Illuminated SMT Tact Switch

## Features

- High bright LED's
- Gold plated dome contact offering superior contact reliability in time
- Excellent ergonomics: sharp tactile feel and audible click
- Reduced space usage on board "2 in 1"
- 40 N overload
- Tape and reel
- RoHS compliant and compatible

## Typical Applications

- Application requiring illumination
- Server, storage
- Network infrastructure
- Telecom
- Medical



B

Tactile Switches

## Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: Normally Open  
 TERMINALS: SMT with positioning pegs;  
 SMT without positioning pegs is available, contact Customer Service

## Mechanical

Type	Operating force FA <sup>1</sup> Newtons (grams)	Operating life (operations)	Travel (total travel) mm(mm)
K5AT WH 43GP	4.0 (400)	100,000	0,5 (0.8)

<sup>1</sup> Tolerances of operating force FA is ± 25%.

## Packaging

Standard: 900 pcs per reel; Reel diameter 380 mm  
 Reduced: 180 pcs per reel; Reel diameter 180 mm

## Electrical

POWER MIN/MAX: 0.02VA / 1.0VA  
 VOLTAGE MIN/MAX: 20mVdc – 32 Vdc  
 CURRENT MIN/MAX: 0.1mA – 100mA  
 CONTACT RESISTANCE: <100m Ω  
 INSULATION RESISTANCE: >1G Ω initial, >10M Ω after damp heat  
 BOUNCE TIME: <10ms

## Environmental

OPERATING TEMPERATURE: -40°C to 125°C  
 STORAGE TEMPERATURE: -55°C to 125°C  
 RELATIVE HUMIDITY: 90 to 96% according to NF EN 60068-2-30  
 PROTECTION: dust protection and flux tight (IP 40)  
 OVERLOAD: 40N min

## Process

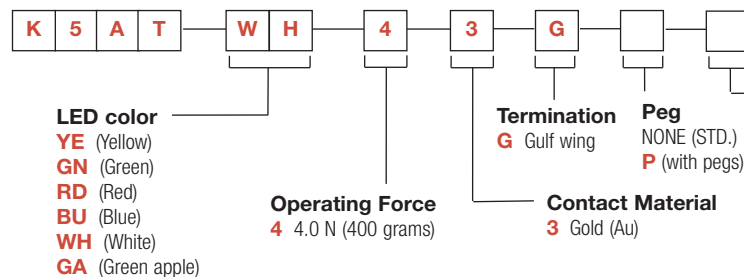
SOLDERING: Compatible with the lead free soldering profile.  
 No washing

## Materials

CONTACTS: Au over Ni  
 SOLDERING: Au over Ni  
 HOUSING: Thermoplastic UL94 V0

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



## Packaging

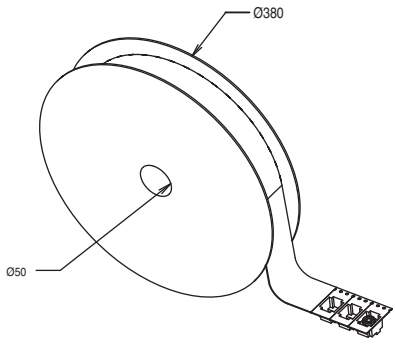
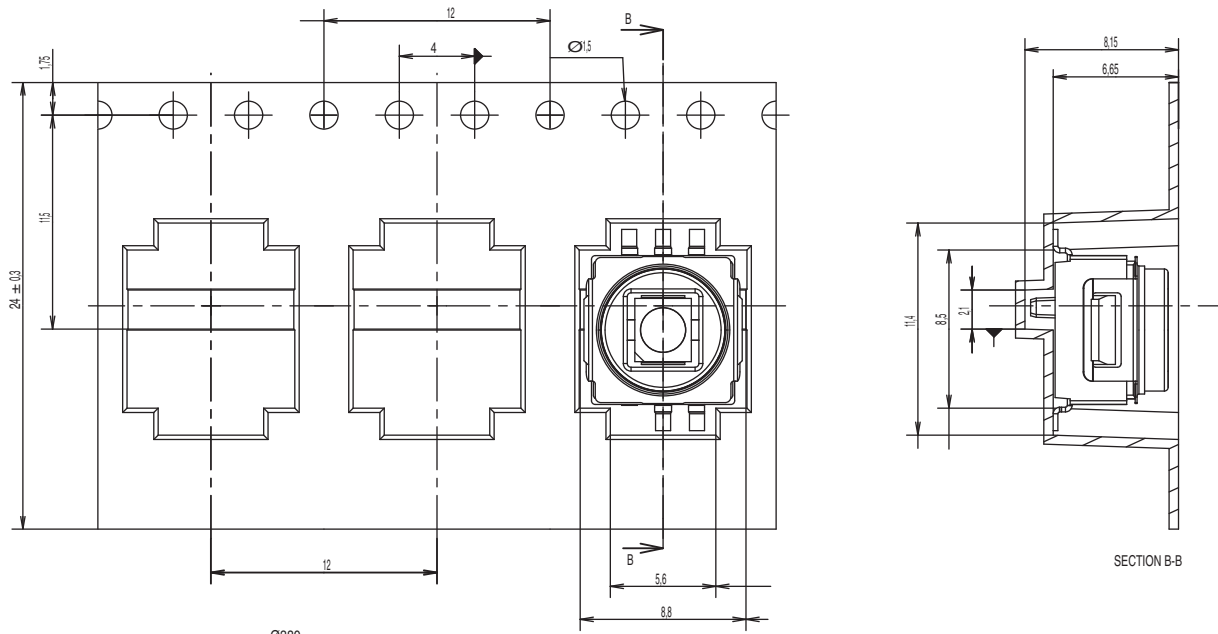
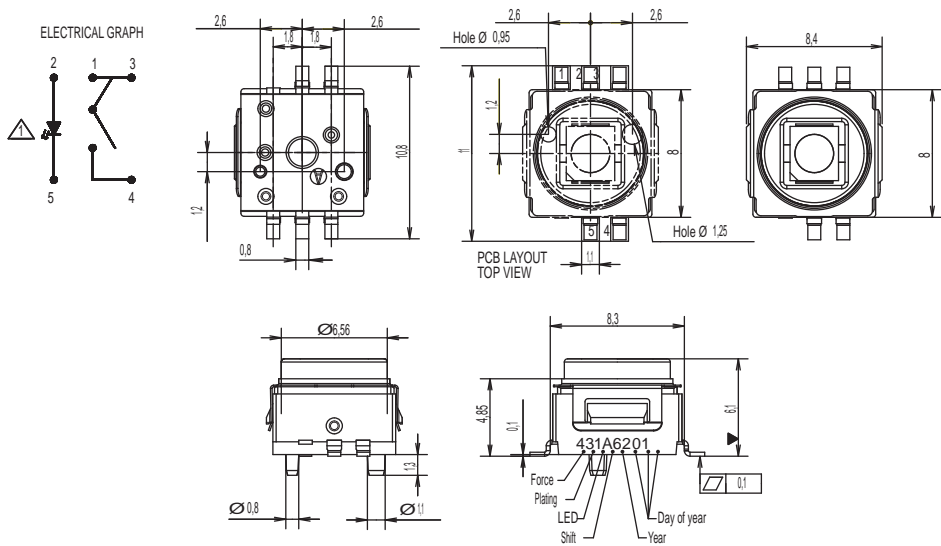
NONE (900 pieces per reel)  
 R (reduced packaging 180 pieces per reel)

# K5AT Illuminated SMT Tact Switch

K5AT

Tactile Switches

B



Dimensions are shown: mm  
Specifications and dimensions subject to change



# Lighted SMT Tact Switch with Rugged LED Mounting Process

## Features

- LED assembly without soldering
- Various LED options
- No light perturbation
- Sound haptic
- Various climatic classes

## Typical Applications

- Automotive
- Network equipment
- Telecommunications
- Medical equipment
- Industrial controls



B

Tactile Switches

## Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make control = SPST, N.O.  
 TERMINALS: Gullwing type for SMT, peg as option, 2 terminals for LED

## Mechanical

Type	Actuation Force (N)	Operating Life (operations)	Total Travel (mm)
K8xx41G LFS	4.0	300,000	0.45±0.15

Tolerances on actuation force is ± 0.25%.  
 SEALING LEVEL: IP40

## Illumination Colors

White, blue, pure green, orange, super red  
 LED technical information available on product specification.  
 For any extra color, please contact your sales representative.

## Packaging

In reels of 900 pieces under sealed foil.  
 Dimensions of reels according to EIA RS481 or IEC 2863.  
 External diameter 380 mm.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1.0 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	0.1 mA
DIELECTRIC STRENGTH: (50 Hz, 1 min.)	≥ 250 Vrms	
CONTACT RESISTANCE:	< 100mΩ	
INSULATION RESISTANCE: (100 V, initial stage)	> 10 <sup>9</sup> Ω	
BOUNCE TIME:	< 10 ms	

## Environmental

OPERATING TEMPERATURE: -40°C to +85°C (Silver)  
 -40°C to +125°C (Gold)

STORAGE TEMPERATURE: -55°C to +85°C (Silver)  
 -40°C to +125°C (Gold)

## Process

SOLDERING: Compatible with the lead free soldering profile.  
 No washing  
 MSL level: 5

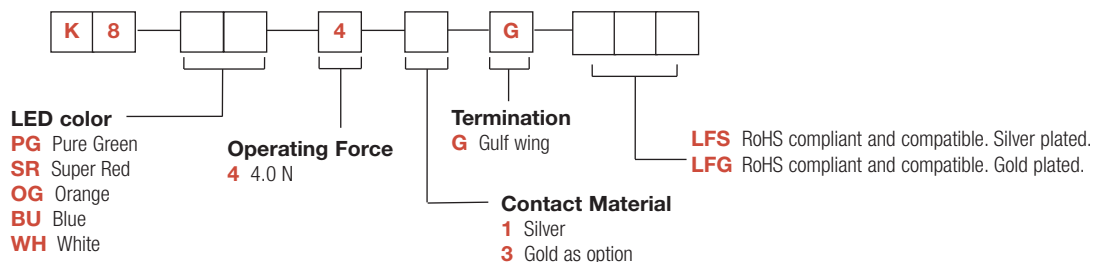
## NOTE:

The specifications show in the datasheet are for reference only and are not valid for design-in work. Please contact your sales representative to request drawings and product specifications.

For systems where reliability and safety are required, please contact your sales representative to secure product integration and function to secure usage.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

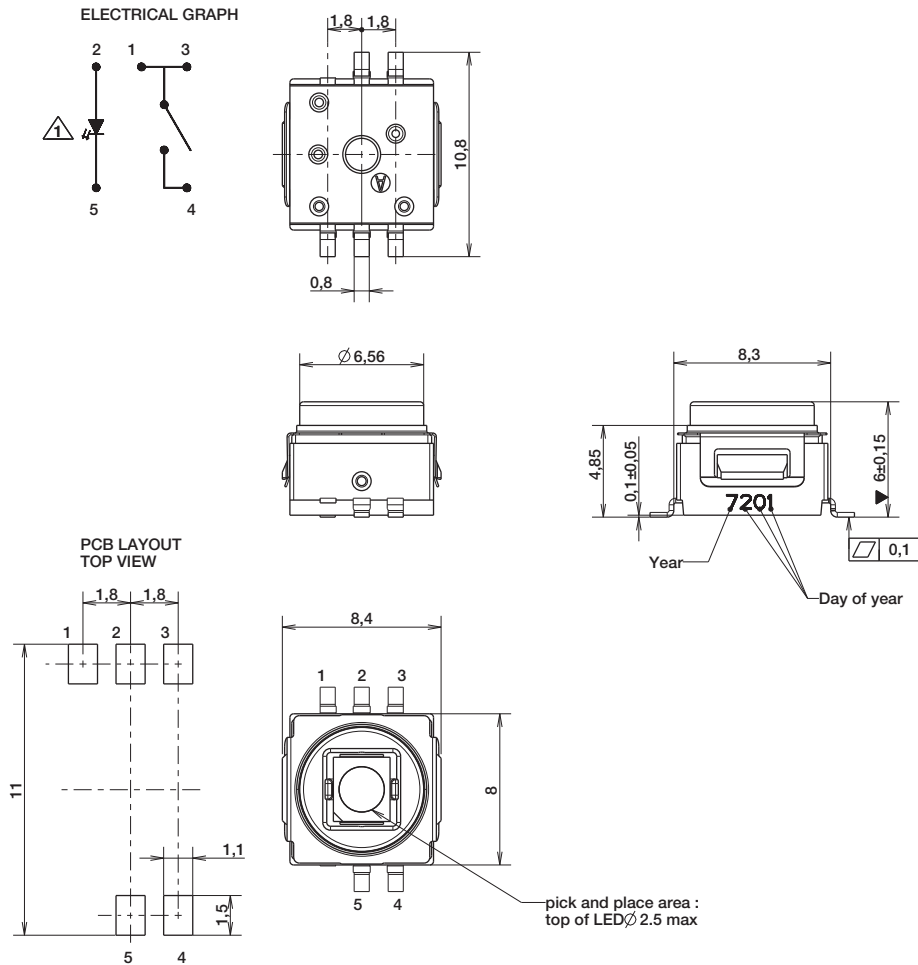


# K8 Lighted SMT Tact Switch with Rugged LED Mounting Process

B

Tactile Switches

PART NUMBER	REF LED	EMITTED COLOR	LUMINOUS INTENSITY (mcd) $I_f = 20 \text{ mA}$		CHROMATICITY COORDINATES OR PEAK WAVE LENGTH (typ) $I_f = 20 \text{ mA}$		FORWARD VOLTAGE V $I_f = 20 \text{ MA}$	
			min	typ	X	Y	min	max
K8WH41G	LW T67C-S2U1-5K8L	WHITE	224	560	0,33	0,33	3	4.1
K8BU41G	LB T67C-P2R1-35	BLUE	56	140	465 nm		3	4.1
K8PG41G	LP T676-L1M2-25	PURE GREEN	11.2	28	562 nm		1.8	2.4
K8SR41G	LP T676-Q1R2-1	SUPER RED	71	180	645 nm		1.8	2.3
K8OG41G	LO T676-R1S2-24	ORANGE	112	280	610 nm		1.85	2.35



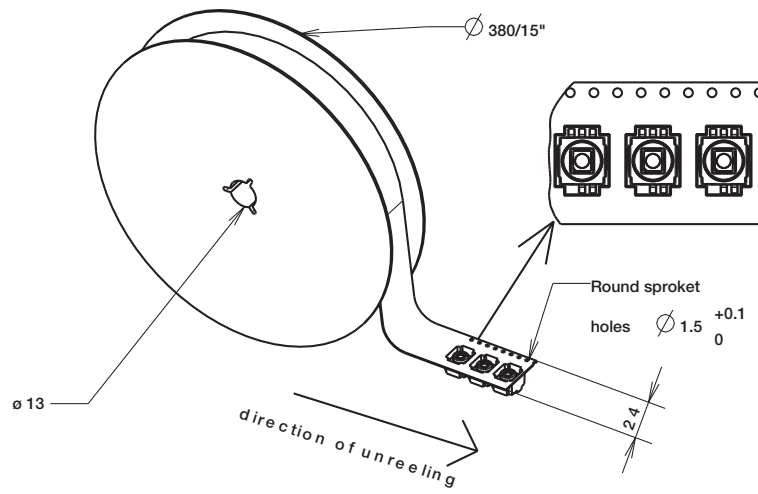
First Angle Projection

Dimensions are shown: mm  
Specifications and dimensions subject to change



# K8 Lighted SMT Tact Switch with Rugged LED Mounting Process

TAPE & REEL



B

Tactile Switches

# K5V Illuminated Tact Switch



## Features

- Gold plated dome contact SPST/SPDT
- Excellent ergonomics
- High bright leds
- Reduced space usage on board
- 40 N overload
- Tape and reel
- RoHS compliant and compatible

## Typical Applications

- When backlighting and switch are required to be a "2 in 1" component
- The dome contact secures a superior contact reliability in time
- The ergonomics of K5V provides a long travel, a sharp tactile feel and an audible click
- Server, storage, automotive, network infrastructure, medical

## Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: Normally Open + Normally Closed  
 TERMINALS:  
 THT: Through hole terminals with positioning pegs  
 SMT: Surface mount terminals with positioning pegs  
 PM: Panel mount solder terminals with wire hole

## Electrical

POWER MIN/MAX: 0.02VA / 1.0VA  
 VOLTAGE MIN/MAX: 20mVdc – 32 Vdc  
 CURRENT MIN/MAX: 0.1mA – 100mA  
 CONTACT RESISTANCE: <150m Ω  
 INSULATION RESISTANCE: >1G Ω initial, >10M Ω after damp heat  
 BOUNCE TIME: <5ms

## Mechanical

Version	Operating force FA <sup>1</sup> Newtons (grams)	Operating life (operations)	Travel (total travel) mm(mm)
THT, SMT, PM	4.0 (400)	25,000	1.2 (2.4)

<sup>1</sup> Tolerances of operating force FA is ± 25%.

## Environmental

OPERATING TEMPERATURE: -40°C to 85°C  
 STORAGE TEMPERATURE: -50°C to 85°C  
 RELATIVE HUMIDITY: 90 to 96% according to NF EN 60068-2-30  
 PROTECTION: dust protection and flux tight  
 OVERLOAD: 40N min

## Packaging

THT:  
 60 pieces per tray; 1800 pieces per box  
 SMT:  
 330 pieces per reel (reel ø 360mm); 1320 pieces per box  
 PM:  
 60 pieces per tray; 2100 pieces per box

## Process

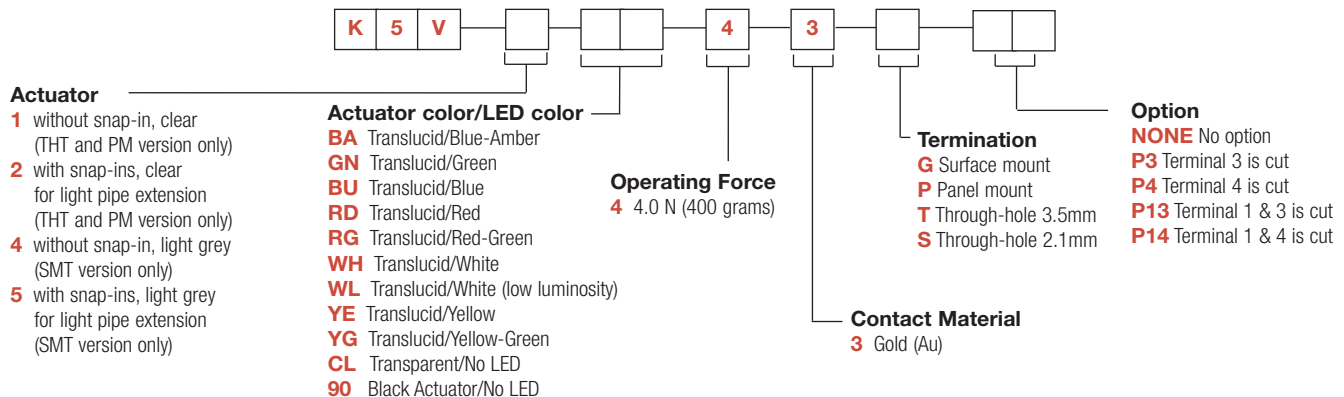
SMT  
 Soldering: Compatible with the lead free soldering profile  
 No washing  
 THT  
 Soldering: Compatible with the lead free soldering profile  
 No washing  
 PM  
 Soldering: Low wattage soldering iron (25-50 watts max).  
 Solder time 3 seconds max. No washing

## Materials

LEAD FREE  
 CONTACTS: Au over Ni  
 SOLDERING: Au over Ni  
 HOUSING: Thermoplastic UL94 V0

## How To Order

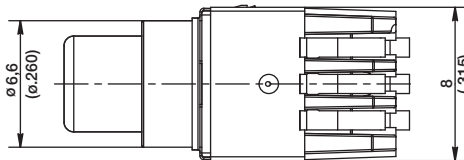
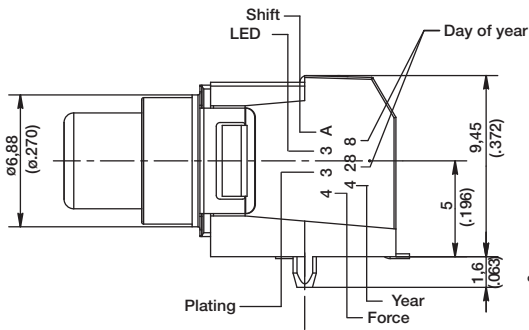
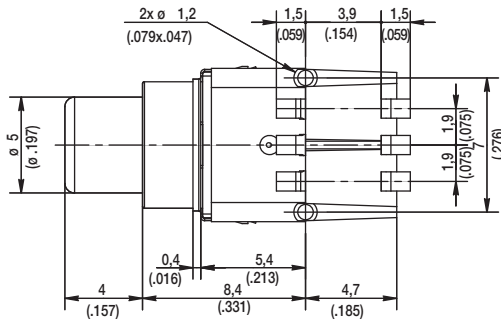
Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



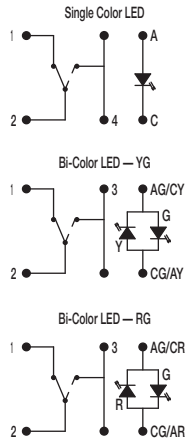


# K5V Illuminated Tact Switch

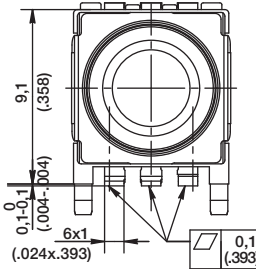
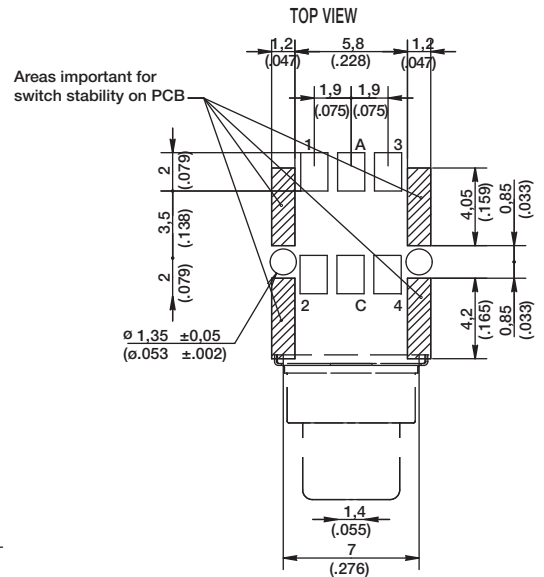
## K5V SMT



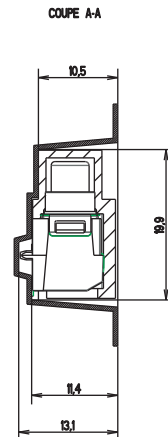
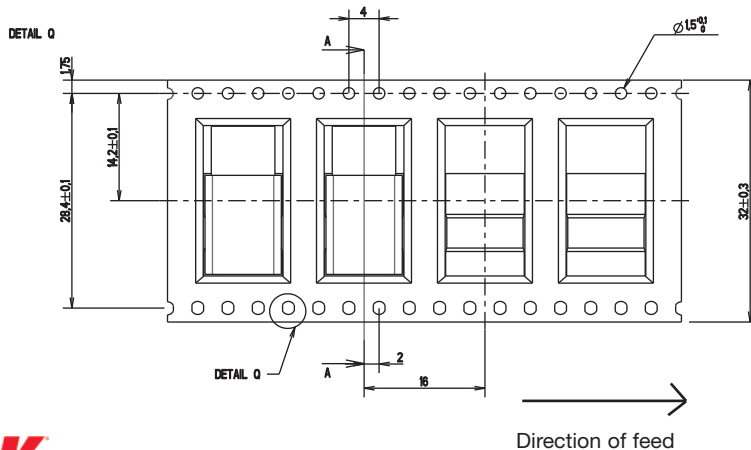
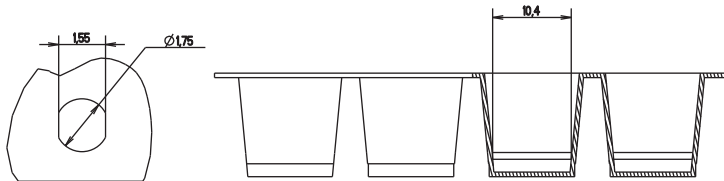
## ELECTRICAL DIAGRAM



## RECOMMENDED PCB LAYOUT ( WITH HOLES )



## TAPE & REEL



Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

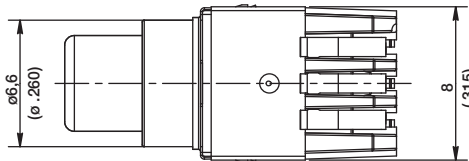
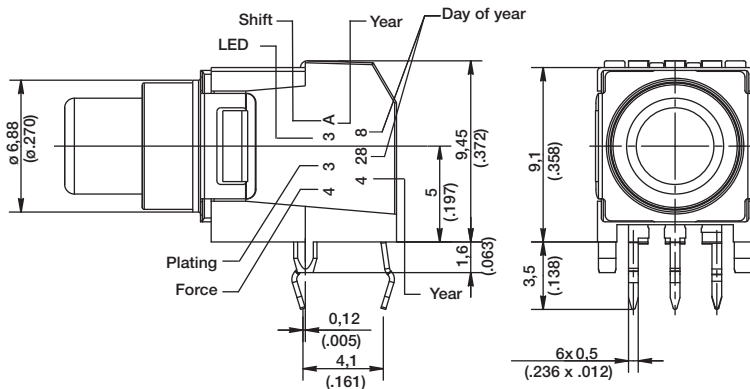
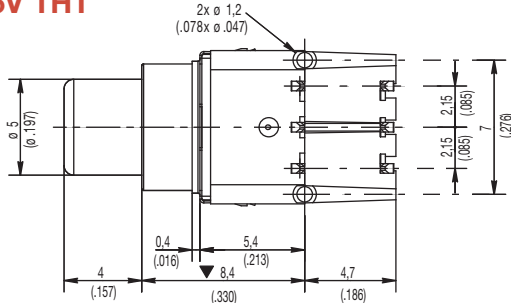


# K5V Illuminated Tact Switch

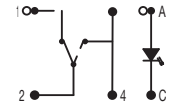
B

Tactile Switches

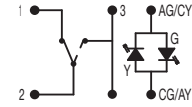
## K5V THT



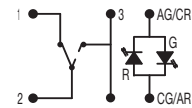
## ELECTRICAL DIAGRAM



Bi-Color LED — YG

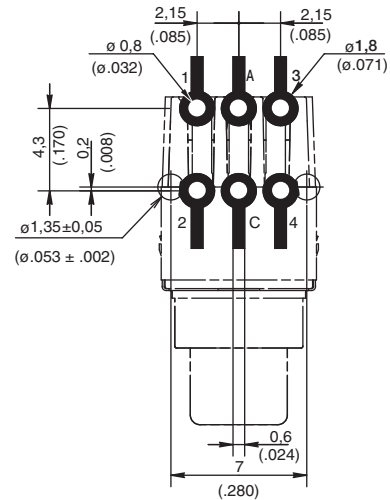


Bi-Color LED — RG

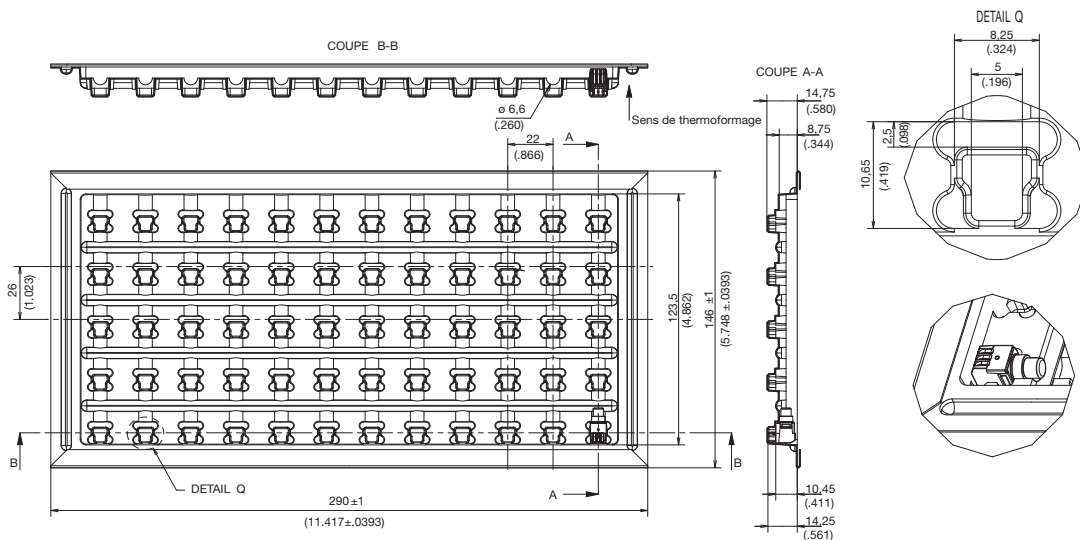


## RECOMMENDED PCB LAYOUT ( WITH HOLES )

### TOP VIEW



## TRAY

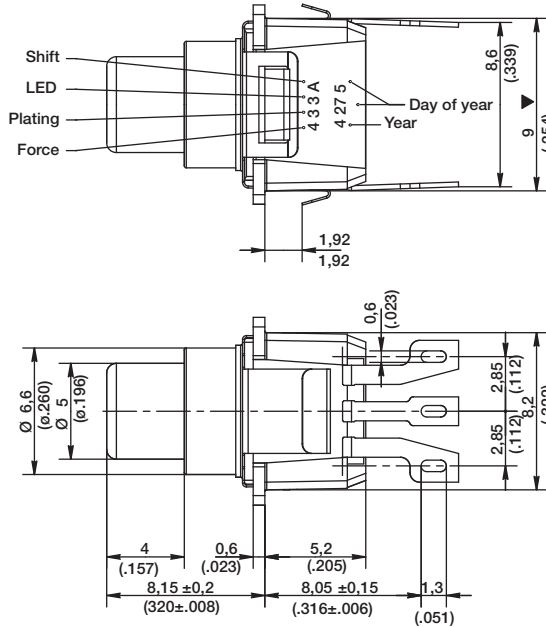


Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

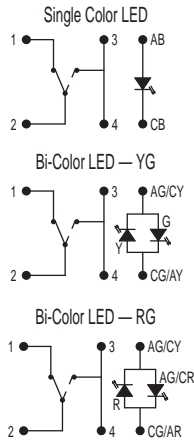
# K5V Illuminated Tact Switch

## K5V PM

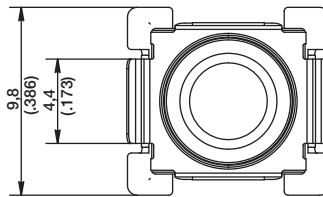
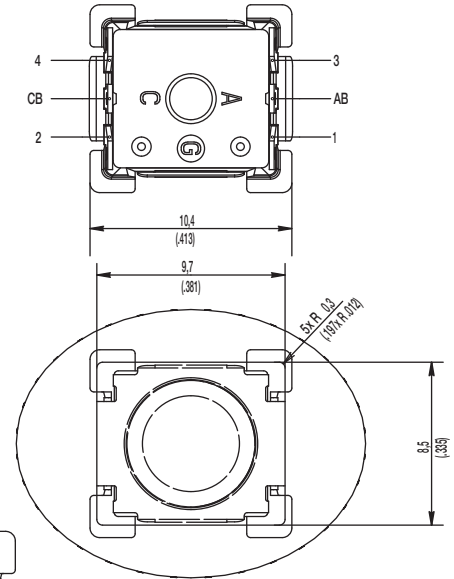
### PRODUCT IDENTIFICATION AND DATE CODES



### ELECTRICAL DIAGRAM



### TERMINAL REFERENCES

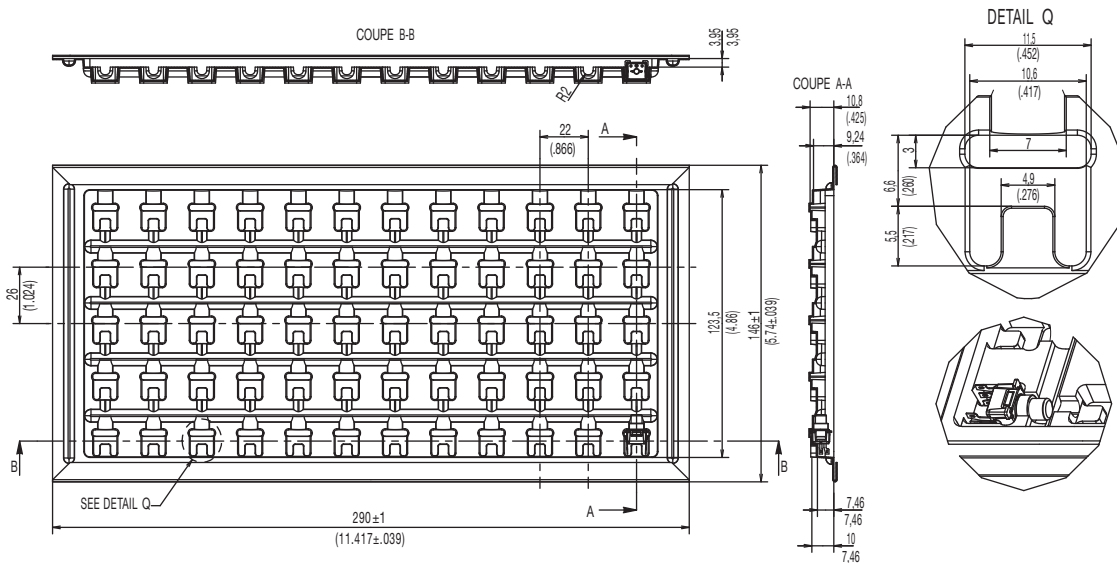


B

Tactile Switches

## TRAY

SUITABLE FOR PANEL THICKNESS OF 1.8MM MAX



Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

# KSF & KSFI Series Soft Actuated Tact Switch



## Features/Benefits

- Soft actuated switch
- Sealed front end
- Top and side actuated

## Typical Applications

- Low profile keyboards
- Automotive interfaces
- Industrial control

B

Tactile Switches

## Specification

FUNCTION: momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
TERMINALS: THT pins

## Mechanical

Type	Force (N)	Operating life (operations)	Travel (mm)
KSF0M211LFT	1.5 ± 0.5	100,000	0.25 ± 0.1
KSF0M311LFT	1.9 ± 0.5	100,000	0.25 ± 0.1
KSF0M411LFT	3.0 ± 0.75	100,000	0.25 ± 0.1
KSF0M511LFT	5.2 ± 1.0	100,000	0.25 ± 0.1
KSFI0V91170SH LFT	3.4 ± 1.5	100,000	0.65 ± 0.25
KSF0M212 LFT	1.6 ± 0.4	300,000	0.25 ± 0.1
KSFI0M412 70SHLFT	3.2 ± 0.8	100,000	0.75 ± 0.25

Overload resistance: 40N, 1 time  
Sealing: IP60 or IP67

**NOTE:** Other configurations of haptics and terminals are available upon demand. Please also refer to KSF and KSFI Mk2 catalogues pages for other options.

This product is designed and manufactured for general electronic devices. For systems where reliability and safety are required, please contact your sales representative to secure product integration and function to secure usage.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	1 mA
DIELECTRIC STRENGTH (50 Hz, 1 min.): > 250 Vrms		
CONTACT RESISTANCE: < 100 m Ω		
INSULATION RESISTANCE (100 V, initial stage): > 10 <sup>9</sup> Ω		
BOUNCE TIME: < 1 ms		

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-40°C to 125°C

## Process

SOLDERING

## Packaging

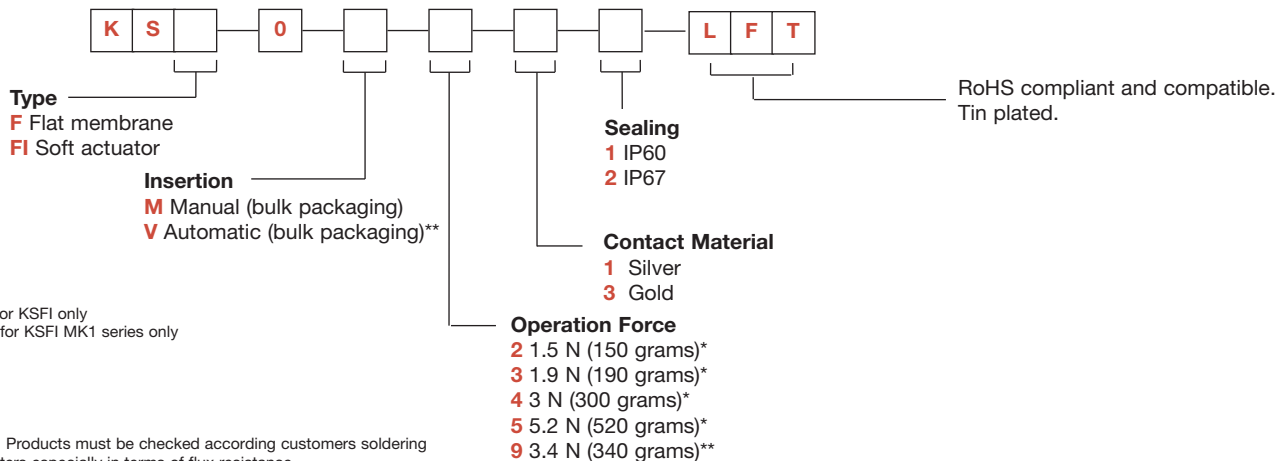
In boxes of 250 pieces (V type) or 500 pieces (M type).

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**

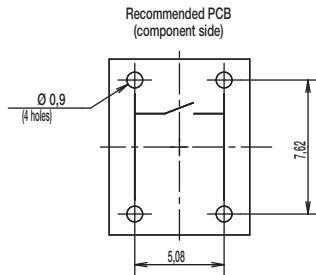
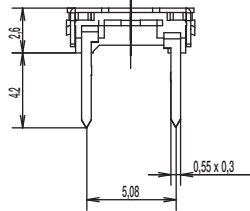
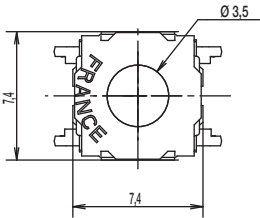
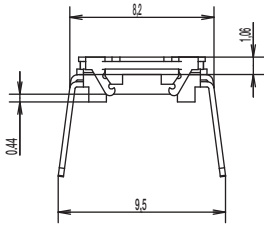


\* valid for KSFI only  
\*\* valid for KSFI MK1 series only

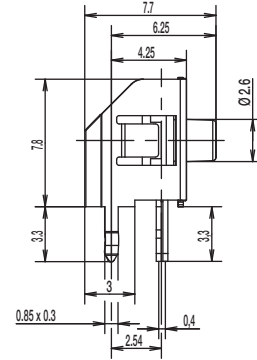
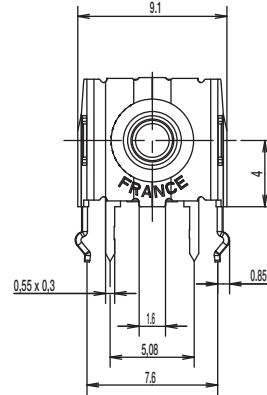
**\*NOTE:** Products must be checked according customers soldering parameters especially in terms of flux resistance.

# KSF & KSFI Series Soft Actuated Tact Switch

## KSF



## KSFI 0V



B

Tactile Switches

# KSA & KSL Series Sealed Tact Switch



## Features/Benefits

- Designed for automatic or manual insertion
- Cambered terminals to ensure self retention
- Top or side actuated
- Large choice of caps
- RoHS compliant and compatible

## Typical Applications

- Automotive
- Industrial
- Telecommunication networks

B

Tactile Switches

## Specification

CONTACT ARRANGEMENT: SPST, N.O.  
 DOUBLE OVERMOLDING ON TERMINAL  
 SEALING: IP60  
 TERMINALS: PC pins, ground pin optional

## Mechanical

Type	Actuation force N	Operating life (operations)	Travel to make
KSA0M211	1,4 ± 0,4	100,000	0,5 ± 0,2
KSA0M311	1,4 ± 0,4	1,000,000	0,5 ± 0,2
KSA0M411	3 ± 0,75	100,000	0,6 ± 0,2
KSA0M511	5 ± 1,5	100,000	0,7 ± 0,2
KSA0M911	3 ± 0,75	500,000	0,6 ± 0,2
KSL0M211	1,4 ± 0,4	100,000	0,5 ± 0,2
KSL0M311	1,4 ± 0,4	1,000,000	0,5 ± 0,2
KSL0M411	3 ± 0,75	100,000	0,6 ± 0,2
KSL0M511	5 ± 1,5	100,000	0,7 ± 0,2
KSL0M911	3 ± 0,75	500,000	0,6 ± 0,2

**NOTE:** Other versions in terms of force, termination length and corrosion protection available. Please contact your sales representative.  
 This data sheet does not provide enough information for applications which require a certain level of quality or safety such as automotive, medical systems, safety equipment. Please contact your sales representative to get contractual specification package.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	1 mA
DIELECTRIC STRENGTH: 250 Vrms		
CONTACT RESISTANCE: ≤ 100m Ω		
INSULATION RESISTANCE (100 V): ≥ 10 <sup>9</sup> Ω		
BOUNCE TIME: ≤ 1 ms		

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-40°C to 85°C	-55°C to 125°C

## Process

Wave soldering compatible with lead free soldering profile.

## Packaging

Can be delivered in tubes of 65 pieces for automatic insertion or in boxes of 500 pieces for manual insertion (250 pieces for KSL, KSLV, KSAV).

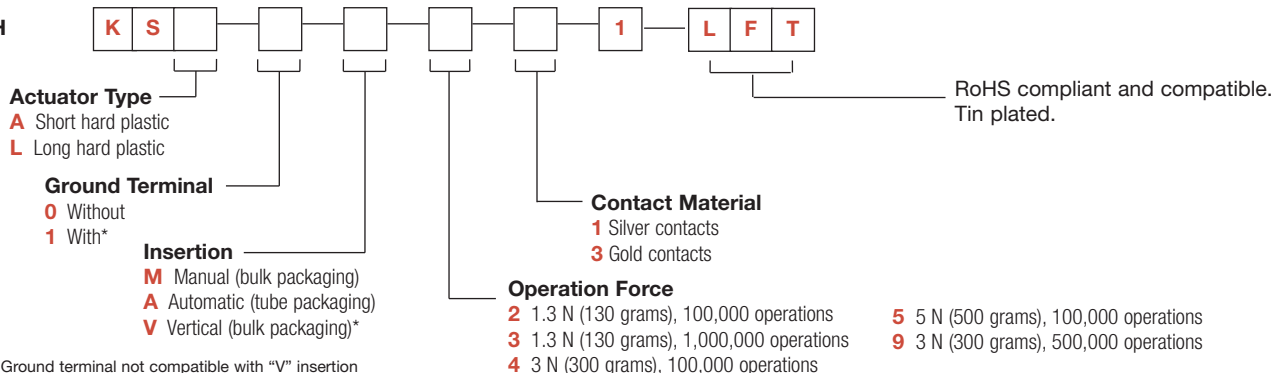
## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

However, please note that all the combinations of these options are not feasible.

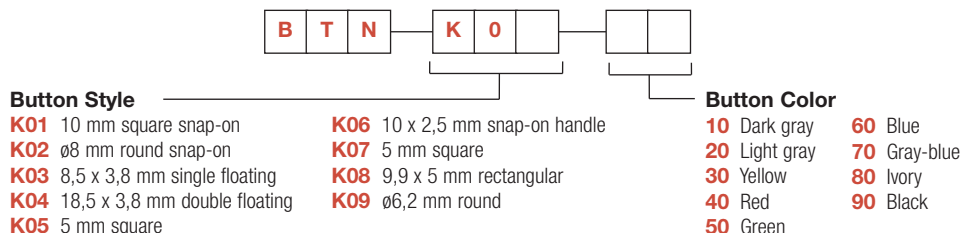
For any part number different from those listed above, please consult your local representative.

## SWITCH



\*Note: "1" Ground terminal not compatible with "V" insertion

**BUTTONS** Buttons must be ordered separately and will be supplied in bulk.



\*NOTE: Please note that all buttons are not RoHS compliant. Please check the compliance with your C&K sales representative.

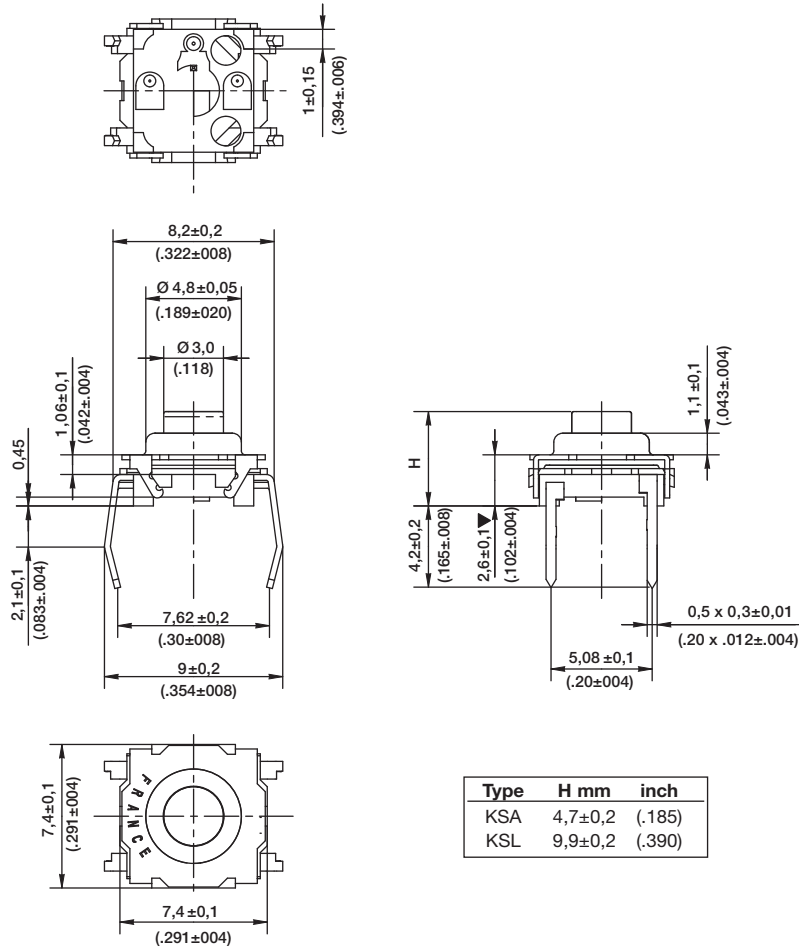


Dimensions are shown: mm (inches)  
 Specifications and dimensions subject to change

# KSA & KSL Series Sealed Tact Switch

ACTUATOR TYPE

KSA & KSL

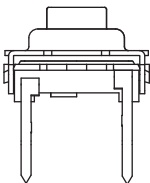


B

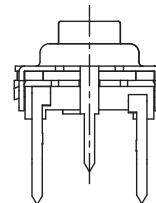
Tactile Switches

GROUND TERMINAL

0 WITHOUT



1\* WITH



\*Not compatible with "V" insertion



First Angle  
Projection

Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

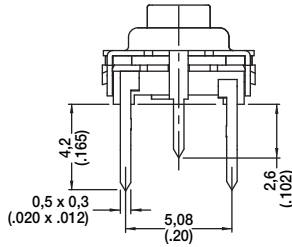
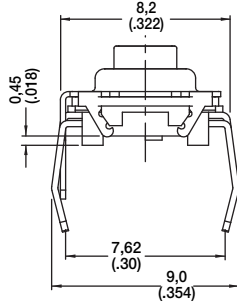
**C&K**

# KSA & KSL Series Sealed Tact Switch

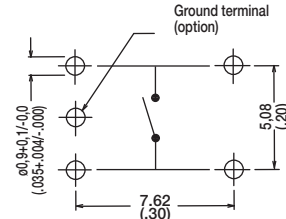
## INSERTION

Tactile Switches

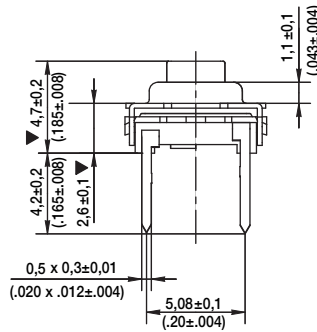
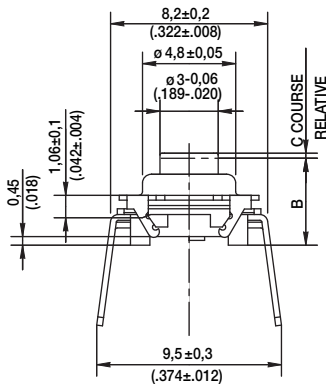
### M MANUAL (BULK PACKAGING)



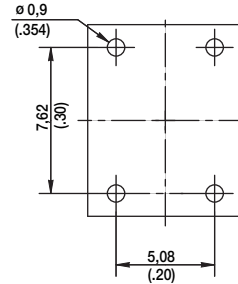
### PCB LAYOUT



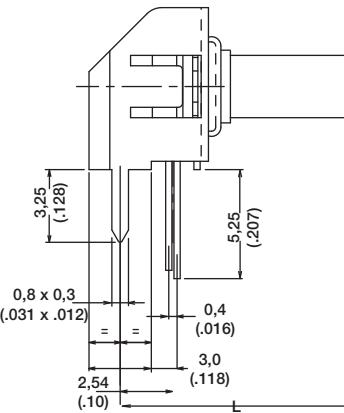
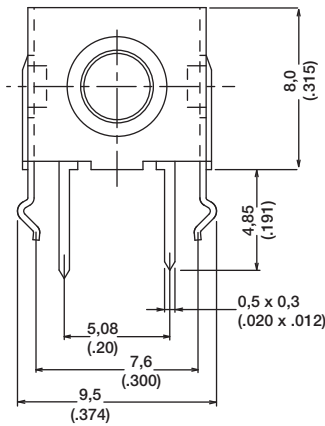
### A AUTOMATIC (TUBE PACKAGING, 65 PIECES PER TUBE)



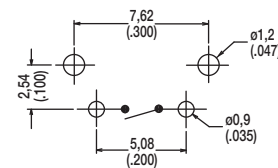
### PCB LAYOUT



### V VERTICAL



### PCB LAYOUT



### DIMENSION L

Type	L mm	inch
KSA0V	5,8	.228
KSL0V	11,1	.437

## OPERATING FORCE

OPTION CODE	OPERATING FORCE
<b>2</b>	1.3 N (130 grams) 100,000 operations
<b>3</b>	1.3 N (130 grams) 1,000,000 operations
<b>4</b>	3.0 N (300 grams) 100,000 operations
<b>5</b>	5.0 N (500 grams) 100,000 operations
<b>9</b>	3.0 N (300 grams) 500,000 operations



First Angle  
Projection

Dimensions are shown: mm (inches)

Specifications and dimensions subject to change





# KSA & KSL Series Sealed Tact Switch

## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL
<b>1</b>	Silver contacts
<b>3</b>	Gold contacts

## SEALING

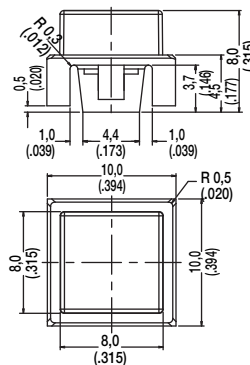
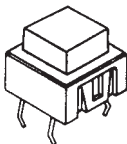
OPTION CODE	SEALING
<b>1</b>	Sealing level IP60

## BUTTONS

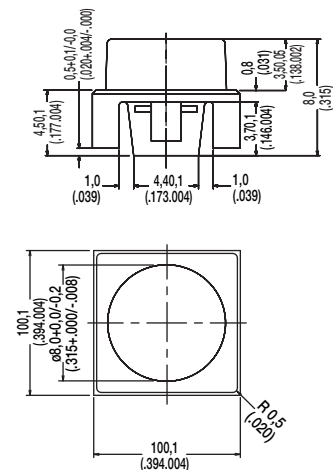
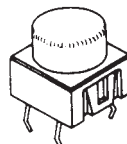
Buttons must be ordered separately and will be supplied in bulk.

BUTTON TYPE	KSA	KSL	KSAV	KSLV
<b>K01</b>	X			
<b>K02</b>	X			
<b>K03</b>	X	X	X	X
<b>K04</b>	X	X	X	X
<b>K05</b>		X		X
<b>K06</b>	X			
<b>K07</b>		X		X
<b>K08</b>		X		X
<b>K09</b>		X		X

**K01**



**K02**



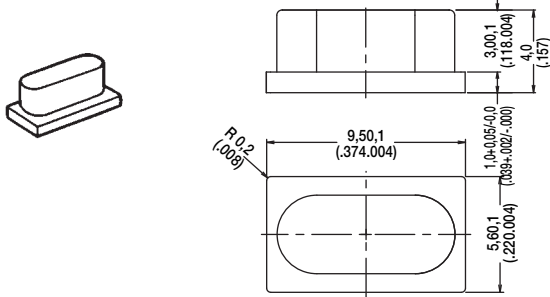
Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

# KSA & KSL Series Sealed Tact Switch

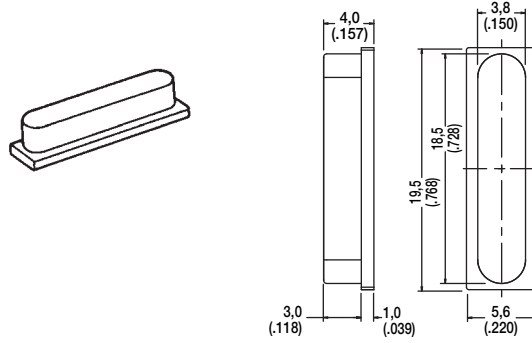
Tactile Switches

B

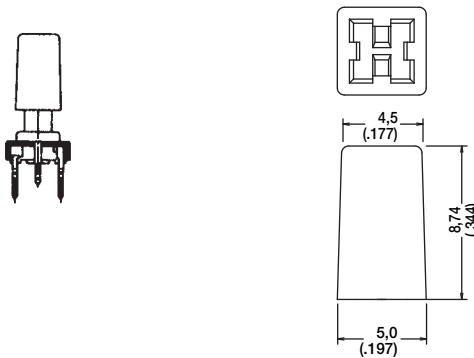
**K03**



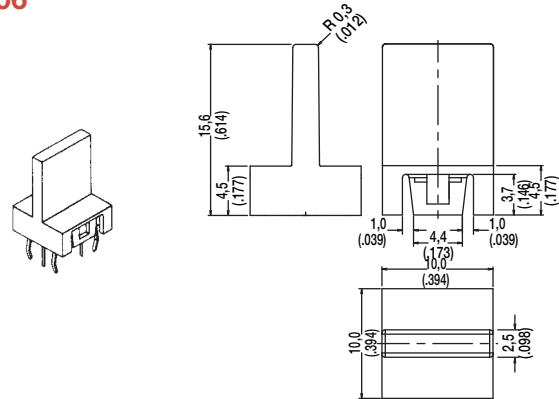
**K04**



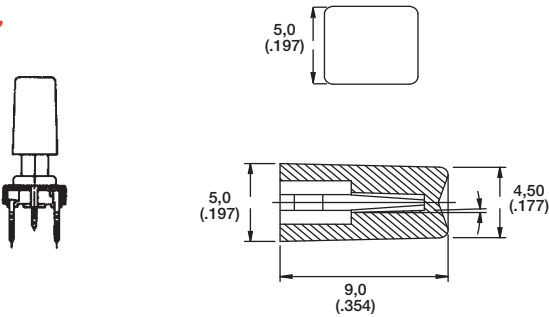
**K05**



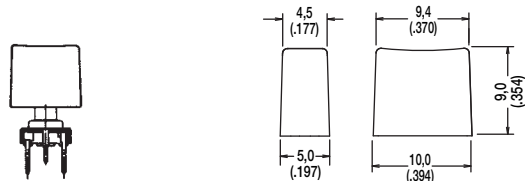
**K06**



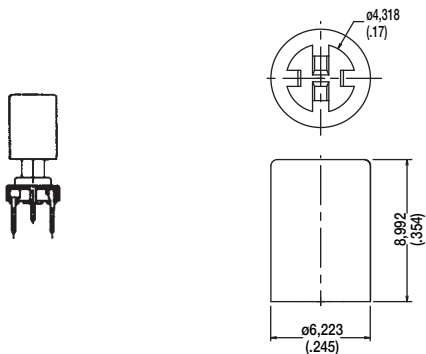
**K07**



**K08**



**K09**



First Angle  
Projection

Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

# KSA & KSL MKII Series High Performance Sealed Tact Switch

## Features/Benefits

- Highest tact switch sealing performance
- Improved sealing through a modification of the crimping technique and to a double overmolding of the terminal
- Totally sealed
- Up to 1M operations
- RoHS compliant and compatible

## Typical Applications

- Automotive
- Industrial
- Telecommunication networks
- Household appliances
- Heating control systems



B

Tactile Switches

## Specification

CONTACT ARRANGEMENT: SPST, N.O.  
TERMINALS: PC pins  
SEALING: IP65  
Double overmold on terminals

## Mechanical

Type	Actuation force N (grams)	Operating life (operations)	Travel to make
KSA0M212	1,3 ± 0,3	100,000	0,5 ± 0,15
KSA0M312	1,3 ± 0,3	1,000,000	0,5 ± 0,15
KSA0M412	3,25 ± 0,5	100,000	0,6 ± 0,25
KSA0M512	5 ± 1,25	100,000	0,7 ± 0,25

## Packaging

Delivered in boxes of 500 pieces (250 pieces for KSL)

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

Other versions in terms of force, termination length and corrosion protection available.  
Please contact your sales representative.

This data sheet does not provide enough information for applications which require a certain level of quality or safety such as automotive, medical systems, safety equipment.  
Please contact your sales representative to get contractual specification package.

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100m Ω	
INSULATION RESISTANCE (100 V):	≥ 10 <sup>9</sup> Ω	
BOUNCE TIME:	≤ 1 ms	

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-40°C to 85°C	-55°C to 125°C

## Process

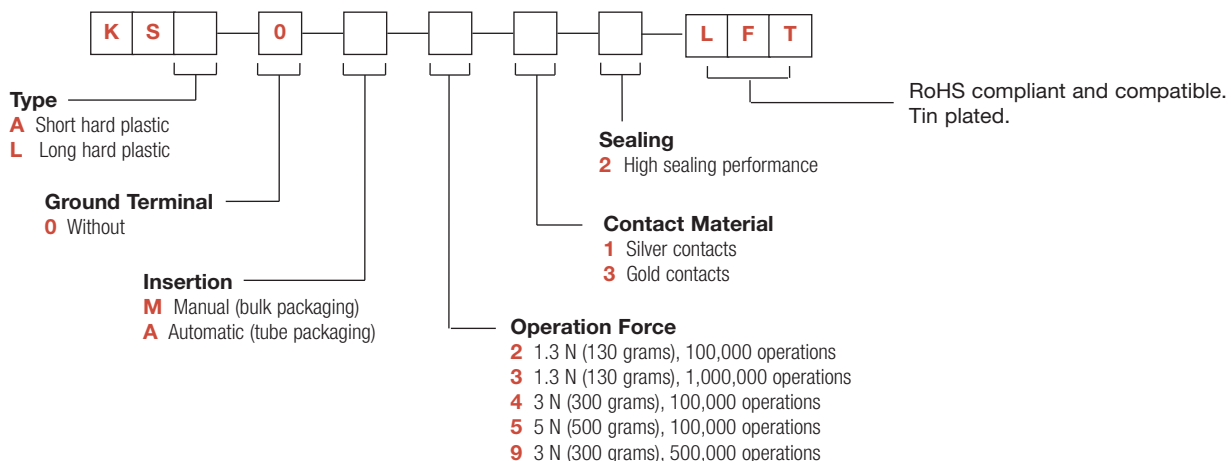
Wave soldering compatible with lead free soldering profile.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed above, please consult your local representative.**

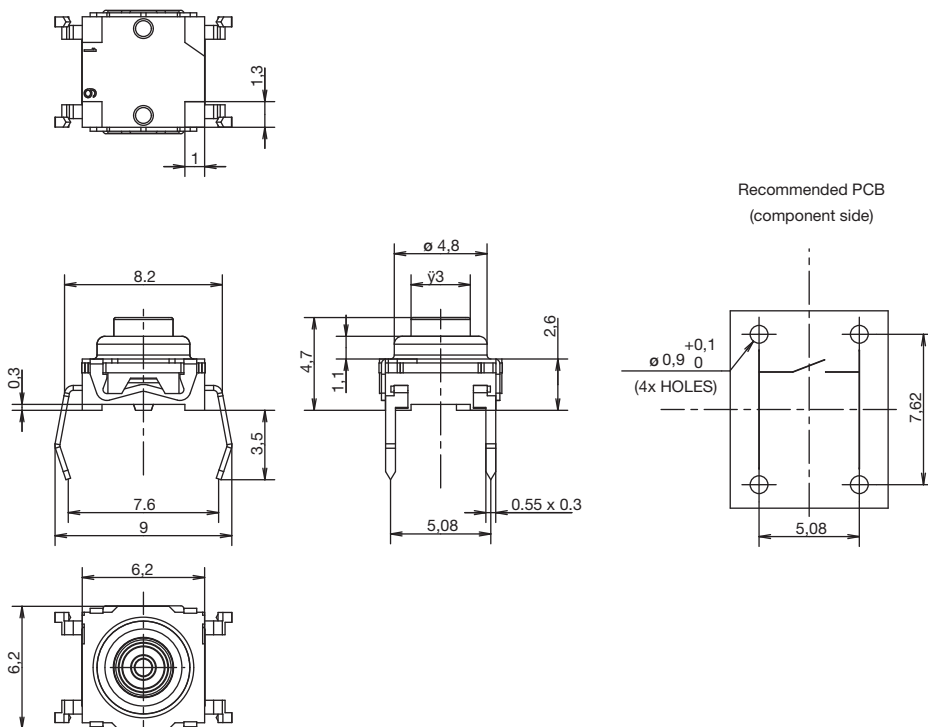


# KSA & KSL MKII Series High Performance Sealed Tact Switch

TYPE 

**KSA & KSL**

**MANUAL INSERTION**

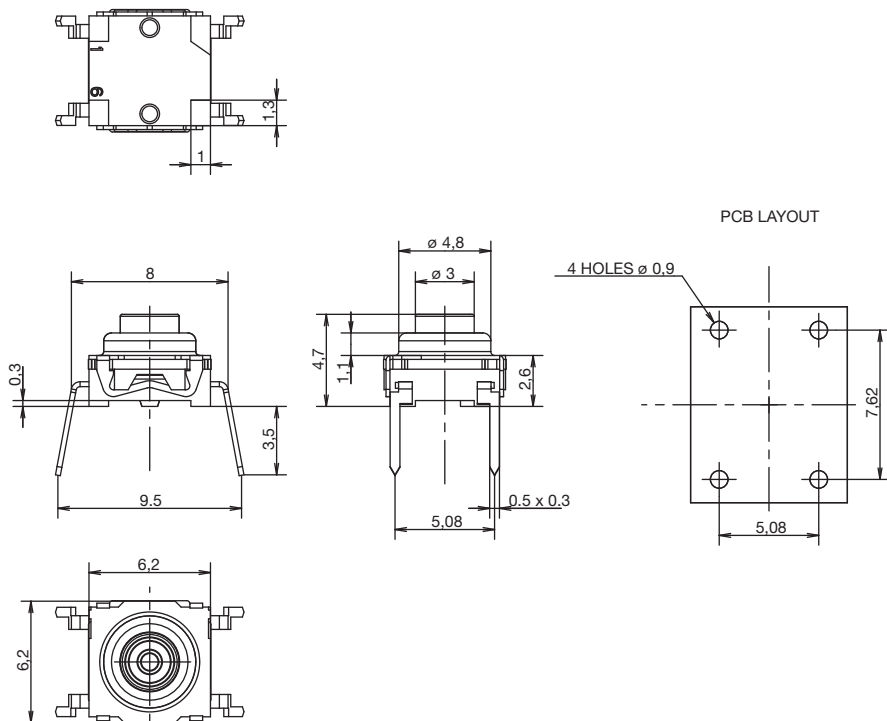


Tactile Switches

B

**KSA & KSL**

**AUTOMATIC INSERTION**



Dimensions are shown: mm  
Specifications and dimensions subject to change

# KSJ Series Spherical Actuator Tact Switches

## Features/Benefits

- Spherical actuator allows actuation force off center  $\pm 30^\circ$  with regard to vertical
- RoHS compliant and compatible
- Designed for mechanisms
- Compliant side actuation

## Typical Applications

- Automotive
- Cranes, off road, railway
- Factory automation
- Security systems



B

Tactile Switches

## Specification

FUNCTION: Momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 DISTANCE BETWEEN BUTTON CENTERS (min.): 7.62 (0.300)  
 TERMINALS: PC pins  
 SEALING: IP60

## Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-40°C to 85°C	-55°C to 125°C

## Packaging

Delivered in boxes of 250 pieces.

## Mechanical

Type	Actuation force N (grams)	Operating life (operations) axial	Operating life (operations) radial	Travel to make (mm)
KSJ0M21160SH	2 ± 0,5	100,000	30,000	0,6 ± 0,3
KSJ0M41180SH	3,0 ± 0,8	100,000	30,000	0,55 ± 0,25
KSJ0M21180SH	2 ± 0,5	100,000	30,000	0,35 ± 0,2
KSJ0M91180SH	3,9 ± 0,8	100,000	30,000	0,7 ± 0,25

## Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mV	20 mV
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA	1 mA
DIELECTRIC STRENGTH (50 Hz, 1 min.): $\geq 250$ Vrms		
CONTACT RESISTANCE: $\leq 100$ m $\Omega$		
INSULATION RESISTANCE (100V): $\geq 10^9$ ohms		
BOUNCE TIME: $\leq 1$ ms		

## Process

Wave soldering, compatible with lead free soldering profile.

**NOTE:** Specifications listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

This data sheet does not provide enough information for applications which require a certain level of quality or safety such as automotive, medical systems, safety equipment. Please contact your sales representative to get contractual specification package.

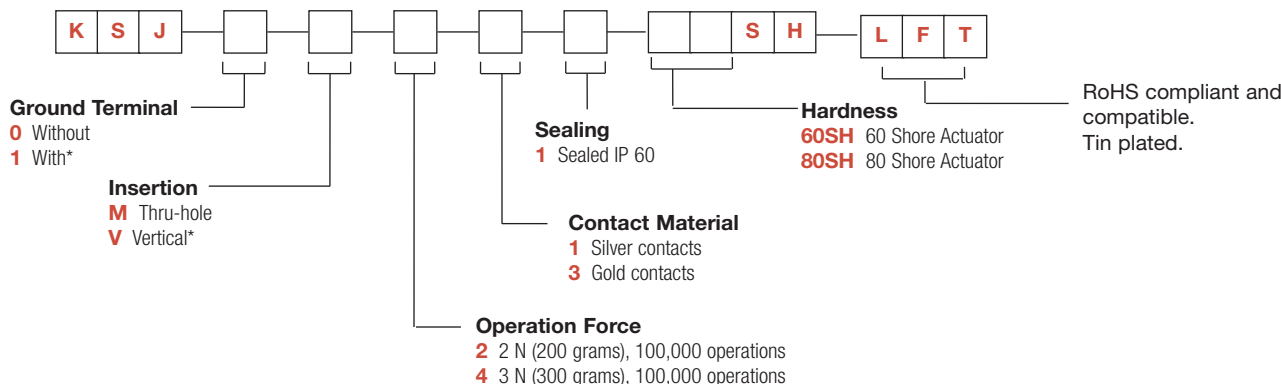
\* Please contact your C&K representative for any question regarding the product integration.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

**However, please note that all the combinations of these options are not feasible.**

**For any part number different from those listed in the table above, please consult your local representative.**



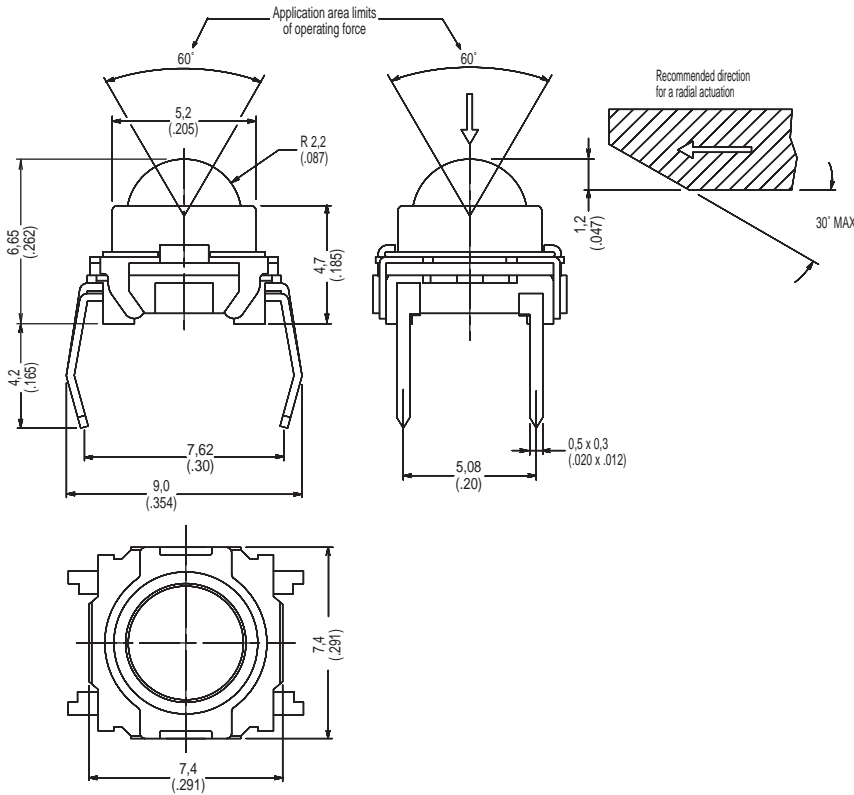
\*Note: "1" ground terminal option not available with "V" version. The bracket for the "V" version plays this role.



Dimensions are shown: mm (inches)  
 Specifications and dimensions subject to change

# KSJ Series Spherical Actuator Tact Switches

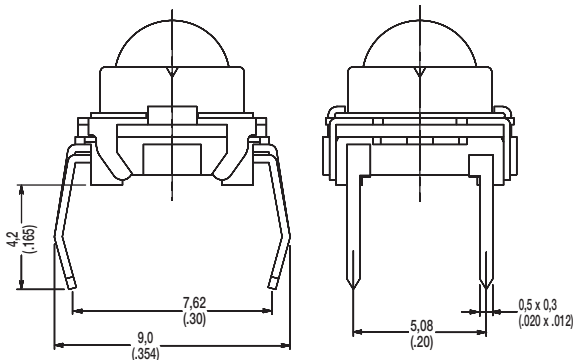
KSJ



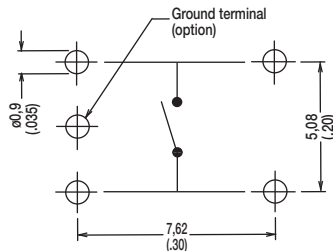
KSJ0M211

## INSERTION

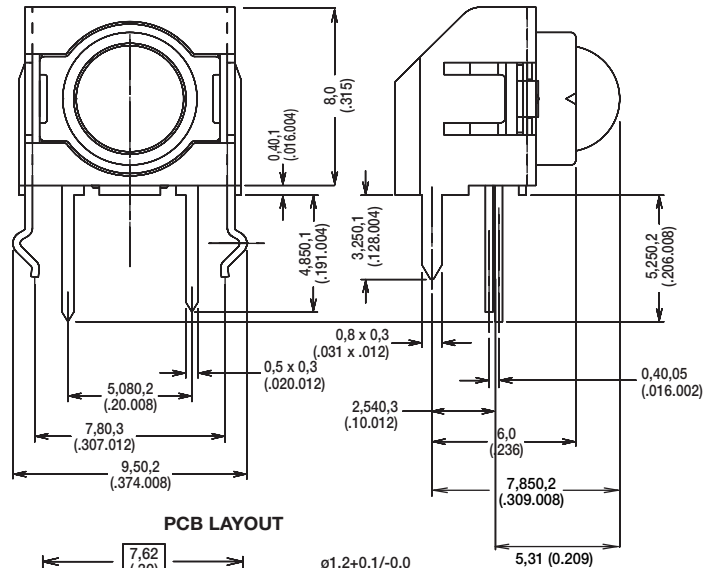
**M** THRU-HOLE



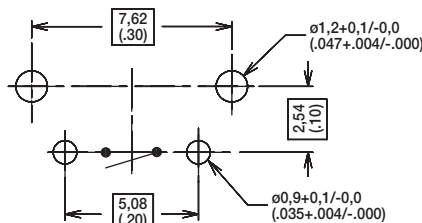
PCB LAYOUT



**V** VERTICAL



PCB LAYOUT



First Angle  
Projection

Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change



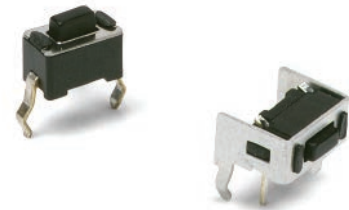
# PTS635 Series 3,5 mm Tact Switches

## Features/Benefits

- Compact size 6 x 3.5 mm
- Variety of switch heights
- Choice of actuation force
- RoHS compliant and compatible

## Typical Applications

- Consumer products
- Instrumentation
- Computer products
- Industrial



Tactile Switches

## Specification

FUNCTION: Momentary action  
CONTACT ARRANGEMENT: SPST, N.O.  
TERMINALS: PC pins

## Mechanical

ACTUATION FORCE: PTS635L models: 130 grams.  
PTS635H models: 200 grams.  
LIFE EXPECTANCY: 20,000 operations.

## Electrical

CONTACT RATING: 50 mA @ 12 V DC.  
DIELECTRIC STRENGTH: 250 V AC min.  
CONTACT RESISTANCE: 100 mΩ max. initial.  
INSULATION RESISTANCE: 10<sup>11</sup>Ω min.

## Environmental

OPERATING TEMPERATURE: -40°C to 60°C

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## Process

SOLDERING: Preheating to 100°C for 45 sec. max. Keep flux flush with top surface of PCB; do not apply to component side of PCB and area where terminals are located. Soldering to 255°C for 5 sec. max. Clean by brushing on solder surface. Do not clean switch with solvents.

## Materials

BASE: 6/6 nylon or glass filled polyester (PBT) (UL 94V-0).  
ACTUATOR: 6/6 nylon or polyacetal (UL 94HB).  
COVER PLATE: PTS635S and PTS635V models: Tin plated stainless steel  
DOME CONTACTS: Phosphor bronze, silver clad.  
STATIONARY CONTACTS: Brass, silver plated.  
TERMINALS: Brass, silver plated. Insert molded.

## Packaging

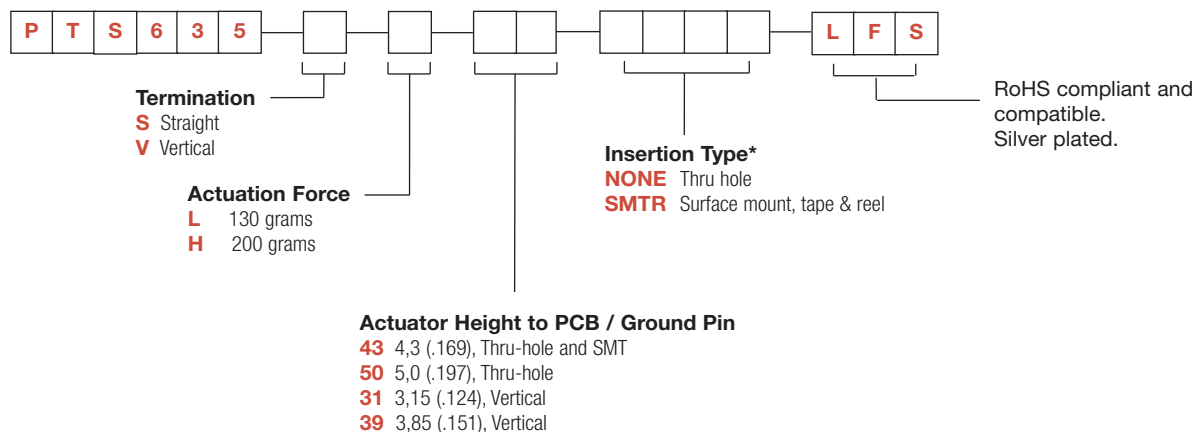
Bulk packaging.

## Tape & reel for:

PTS635Sx43SMTR, 1700 pcs per reel

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

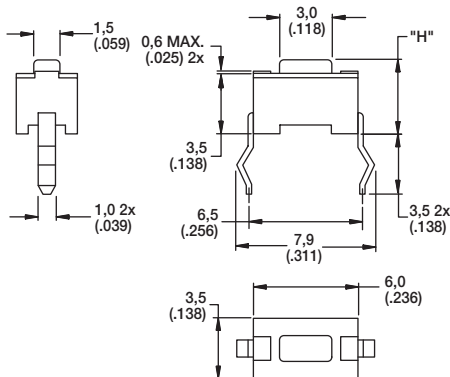


\* SMTR only available with PTS635 43 Actuator Height options.

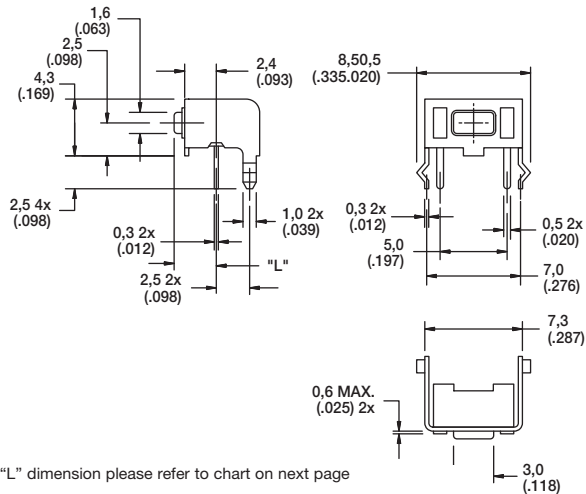
# PTS635 Series 3,5 mm Tact Switches

SERIES

## PTS635



For "H" dimension please refer to chart on next page

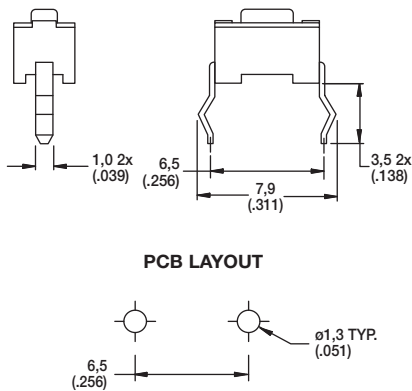


For "L" dimension please refer to chart on next page

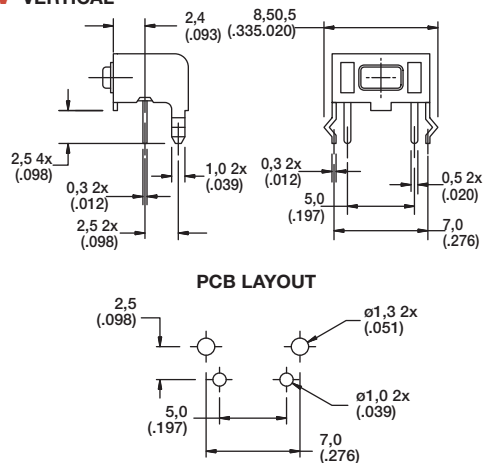
Tactile Switches

TERMINATION

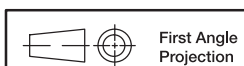
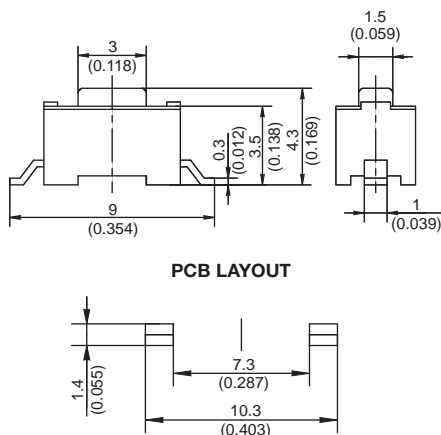
### S STRAIGHT



### V VERTICAL



### SMT 43



First Angle  
Projection

Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change





# PTS635 Series 3,5 mm Tact Switches

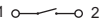

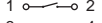
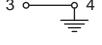
## ACTUATION FORCE



OPTION CODE	FORCE
<b>L</b>	130 grams
<b>H</b>	200 grams

## ACTUATOR HEIGHT

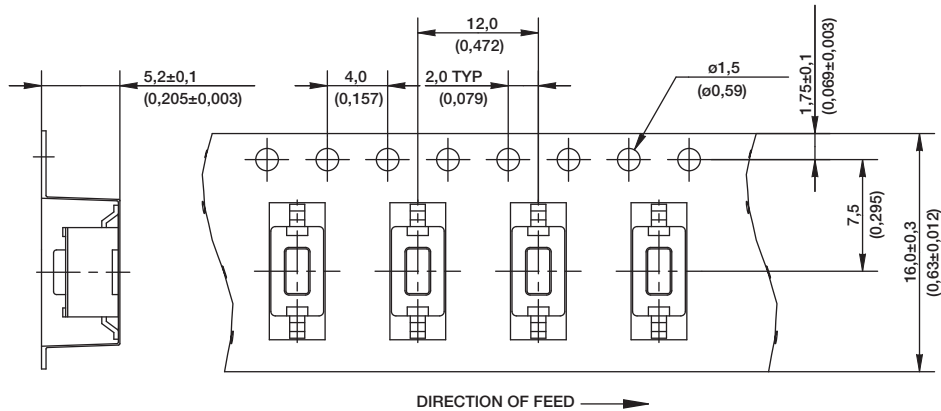


OPTION CODE	HEIGHT "H" or LENGTH "L"	TERMINATION	SCHEMATIC
<b>43</b>	4,3 (.169)	Thru-hole & SMT	1  2
<b>50</b>	5,0 (.197)	Thru-hole	1  2
<b>31</b>	3,15 (.124)	Vertical	1  2
<b>39</b>	3,85 (.151)	Vertical	3  4

## INSERTION TYPE



**SMTR** 43



**B**

Tactile Switches

# PTS641 Series SMT Top Actuated Switches



## Features/Benefits

- 6.3 x 6.3 mm footprint
- Multiple heights
- Ground pin option

## Typical Applications

- Metering
- White goods
- Home and garden equipment

B

Tactile Switches

### Specification

FUNCTION: Momentary action  
CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
TERMINALS: G type for SMT

### Mechanical

TRAVEL:  
0.20 mm ±0.15 mm for 160 & 250 gf  
0.30 mm ±0.15 mm for 320 gf  
OPERATING LIFE: 100,000 cycles  
OPERATION FORCE:  
160 gf ±50 gf blue actuator  
250 gf ±50 gf red actuator  
320 gf ±80 gf black actuator

### Packaging

Switches in reels of 1,500 pieces.  
Dimensions of reels according to EIA 481B  
External diameter 330 mm

### Electrical

MAXIMUM VOLTAGE: 12 VDC  
MAXIMUM CURRENT DC: 50 mA  
DIELECTRIC STRENGTH: 250 VA C (1mm)  
CONTACT RESISTANCE: 100 m Ω  
INSULATION RESISTANCE: ≥ 100 M Ω  
BOUNCE TIME: < 5 ms

### Environmental

OPERATING TEMPERATURE: -20°C to 85°C

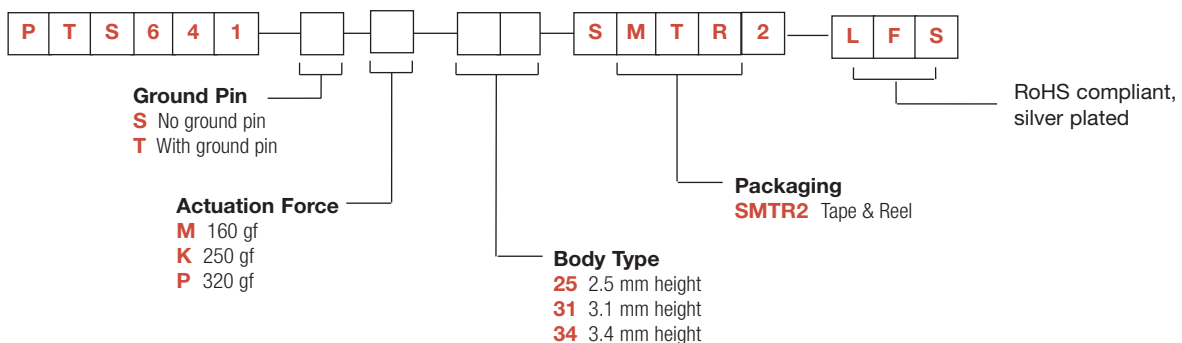
### Process

SOLDERING: This component is suited to the following methods:  
Infrared Reflow Soldering in accordance with IEC61760-1

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

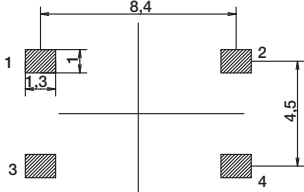
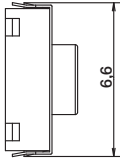
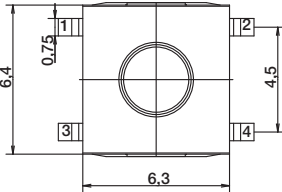
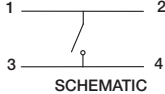
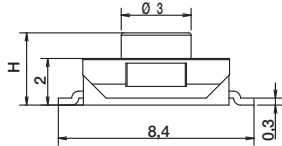
## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



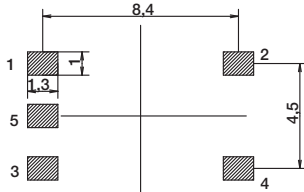
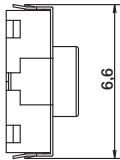
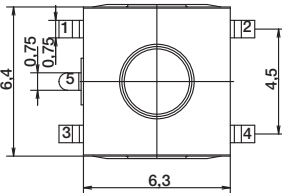
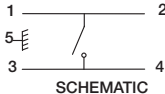
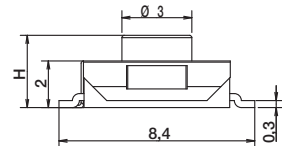
# PTS641 Series SMT Top Actuated Switches

**NO GROUND PIN** H = 2.5, 3.1, or 3.4 mm



RECOMMENDED PCB LAYOUT

**GROUND PIN** H = 2.5, 3.1, or 3.4 mm

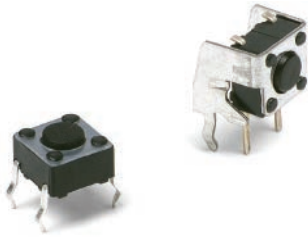


RECOMMENDED PCB LAYOUT



**B**  
Tactile Switches

# PTS645 Series 6 mm Tact Switches



## Features/Benefits

- Compact size 6 x 6 mm
- Variety of actuator lengths
- Choice of actuation force
- RoHS compliant and compatible

## Typical Applications

- Consumer products
- Instrumentation
- Computer products
- Industrial

B

Tactile Switches

### Specification

FUNCTION: Momentary action  
CONTACT ARRANGEMENT: SPST, N.O.  
TERMINALS: PC pins

### Mechanical

ACTUATION FORCE: 130 grams, 160 grams, 200 grams, 260 grams  
LIFE EXPECTANCY: 100,000 operations.

### Electrical

CONTACT RATING: 50 mA @ 12 V DC.  
DIELECTRIC STRENGTH: 250 V AC min.  
CONTACT RESISTANCE: 100 mΩ max. initial.  
INSULATION RESISTANCE: 10<sup>11</sup> Ω min.

### Environmental

OPERATING TEMPERATURE: -20°C to 60°C

### Process

SOLDERING: Preheating to 100°C for 45 sec. max. Keep flux flush with top surface of PCB; do not apply to component side of PCB and area where terminals are located. Soldering to 255°C for 5 sec. max. Clean by brushing on solder surface. Do not clean switch with solvents.

### Packaging

Bulk packaging.

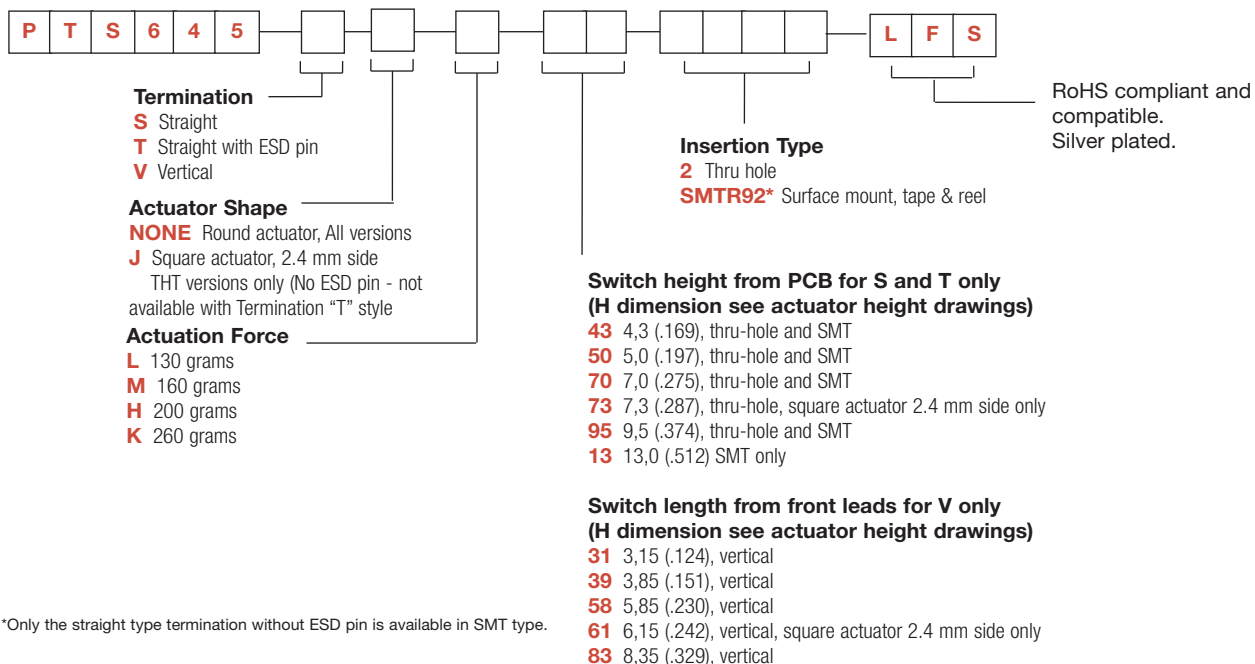
#### Tape & reel for the SMT type:

Reels of 1,000 pieces for 4,3 and 5,0 mm height  
Reels of 700 pieces for 7,0 mm height  
Reels of 500 pieces for 9,5 mm height  
Reels of 400 pieces for 13,0 mm height

**NOTE:** Specifications listed above are for switches with standard options.  
For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

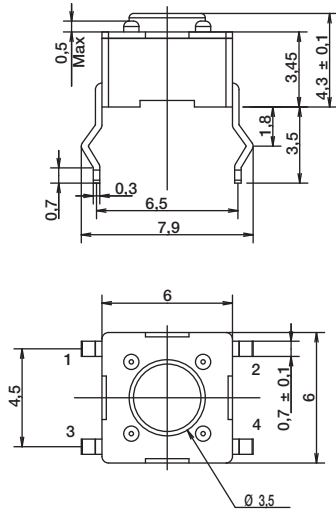


\*Only the straight type termination without ESD pin is available in SMT type.

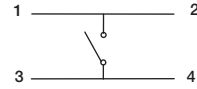
# PTS645 Series 6 mm Tact Switches

## TERMINATION

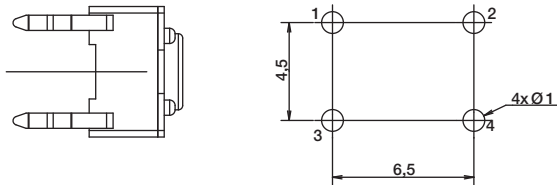
### S STRAIGHT



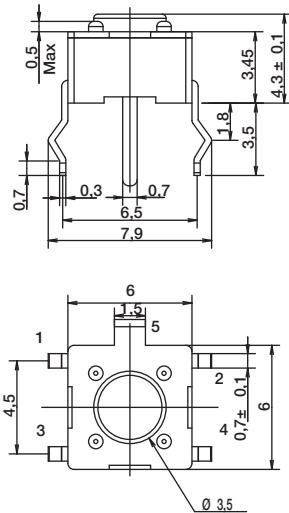
SCHEMATIC



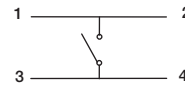
PCB LAYOUT



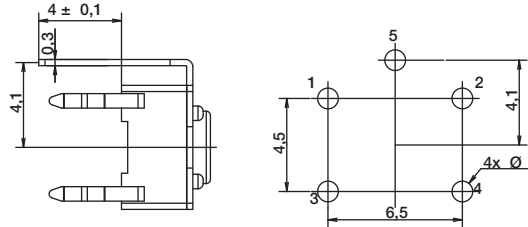
### T STRAIGHT WITH ESD PIN



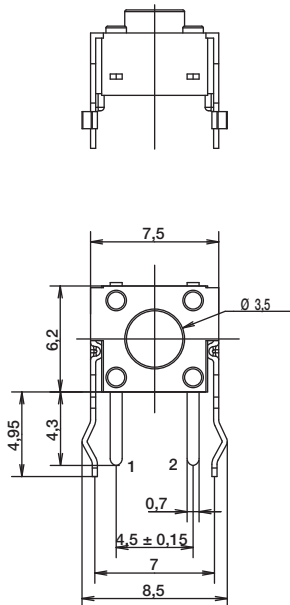
SCHEMATIC



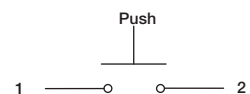
PCB LAYOUT



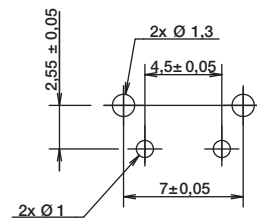
### V VERTICAL



SCHEMATIC



PCB LAYOUT



Dimensions are shown: mm  
Specifications and dimensions subject to change

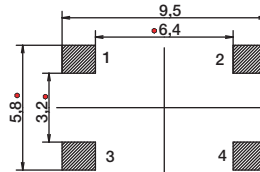
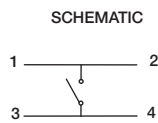
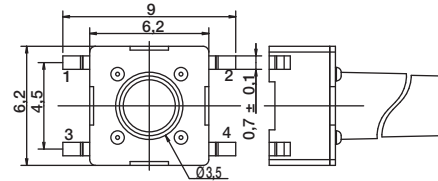
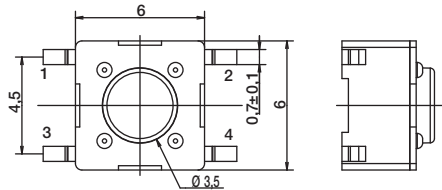
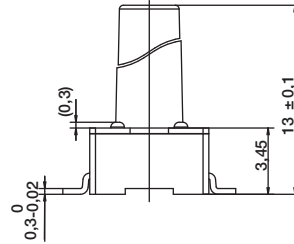
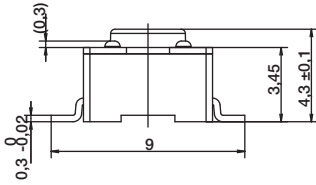
# PTS645 Series 6 mm Tact Switches

## TERMINATION

### SMT

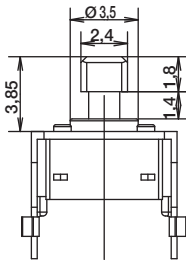
FOR 4.3, 5.0, 7.0, 9.5 MM HEIGHT

13.0 MM HEIGHT ONLY

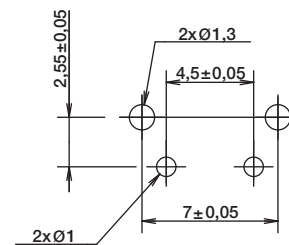
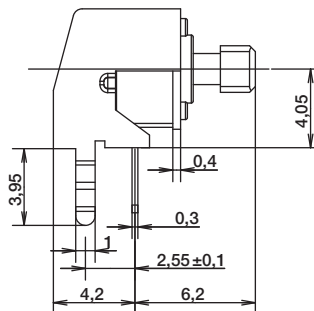
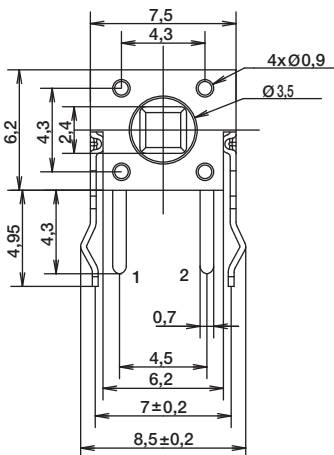
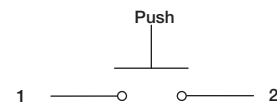


PCB LAYOUT

## ACTUATOR SHAPE



SCHEMATIC



RECOMMENDED PCB LAYOUT

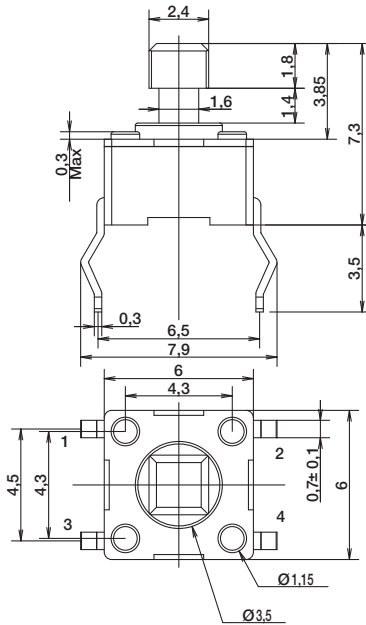


Dimensions are shown: mm  
Specifications and dimensions subject to change

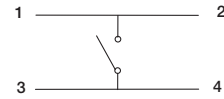


# PTS645 Series 6 mm Tact Switches

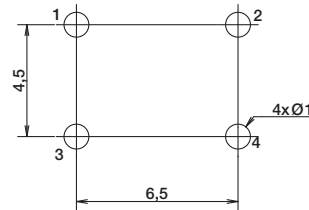
## ACTUATOR SHAPE



SCHEMATIC



RECOMMENDED PCB LAYOUT



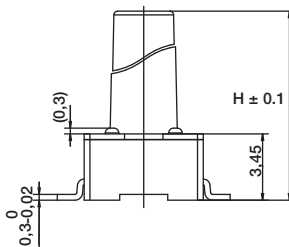
B

Tactile Switches

## ACTUATION FORCE

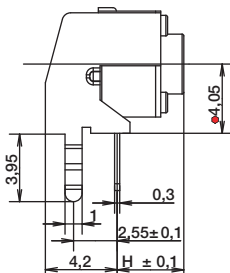
OPTION CODE	FORCE
<b>L</b>	130 grams Black
<b>M</b>	160 grams Blue
<b>H</b>	200 grams Gray
<b>K</b>	260 grams Red

## ACTUATOR HEIGHT



Switch height from PCB for S and T only

OPTION CODE	DIMENSION H	TERMINATION	SCHEMATIC	
			Without EMC pin	With EMC pin
<b>43</b>	4,3 (.169)	Thru-hole and SMT		
<b>50</b>	5,0 (.197)	Thru-hole and SMT		
<b>70</b>	7,0 (.275)	Thru-hole and SMT		
<b>95</b>	9,5 (.374)	Thru-hole and SMT		
<b>13</b>	13,0 (.512)	SMT		



Switch length from front leads for V only

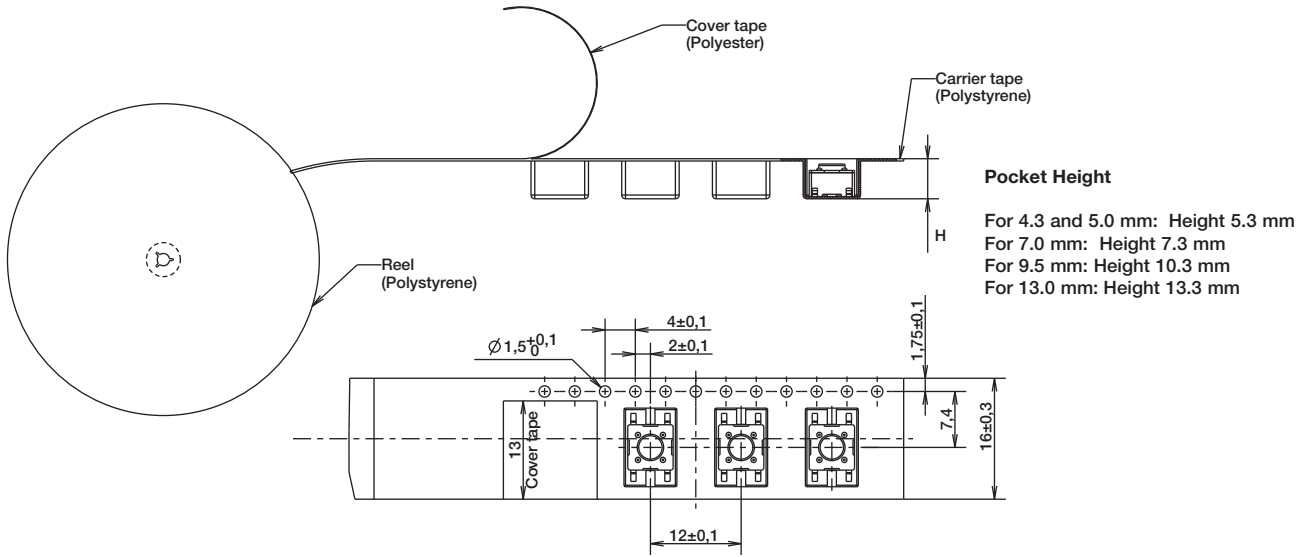
OPTION CODE	DIMENSION H	TERMINATION	SCHEMATIC	
			Without EMC pin	With EMC pin
<b>31</b>	3,15 (.124)	Vertical		
<b>39</b>	3,85 (.151)	Vertical		
<b>58</b>	5,85 (.230)	Vertical		
<b>83</b>	8,35 (.329)	Vertical		

# PTS645 Series 6 mm Tact Switches

## TAPE & REEL

B

Tactile Switches





# PTS645 V SMT Series 6 mm SMT Side Actuated Tact Switch

## Features/Benefits

- Full SMT processing
- Strong PCB soldering pads
- Compact 6 x 6 mm design

## Typical Applications

- Consumer Products
- Set Top and Access Boxes
- Instrumentation
- Home and Garden Equipment



## Specification

FUNCTION: Momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 TERMINALS: G type for SMT  
 TRAVEL: 0.25 mm +0.2/-0.1 mm  
 OPERATING LIFE: 100,000 cycles

## Mechanical

Part Number	Operating Force (gf)	Actuator Color
PTS645 VN13 SMTR92 LFS	100 ± 30	Dark grey
PTS645 VM13 SMTR92 LFS	160 ± 50	Yellow green

## Electrical

MAXIMUM VOLTAGE: 12 V DC  
 MAXIMUM CURRENT: 50 mA  
 DIELECTRIC STRENGTH: 100 V AC (1mn)  
 CONTACT RESISTANCE: ≤ 100 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

## Environmental

OPERATING TEMPERATURE: -20°C to 70°C  
 STORAGE TEMPERATURE: -30°C to 80°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

Recommended solder paste thickness is ≥ 15µm

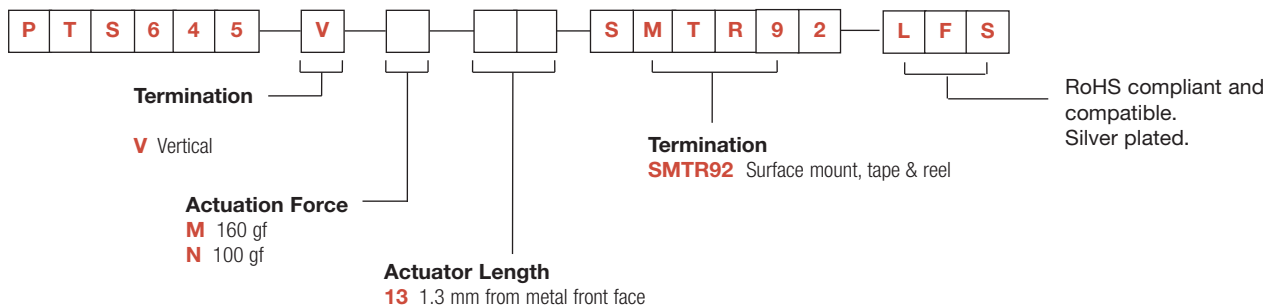
## Packaging

In reels of 650 pieces  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.





# PTS125 Series 12 mm Tact Switches



## Features/Benefits

- THT and SMT terminations
- Various heights
- Snap fit actuator option

## Typical Applications

- Consumer products
- Instrumentation
- Computer products
- Industrial



B

Tactile Switches

## Specification

FUNCTION: Momentary action  
 CONTACT ARRANGEMENT: 1 make contact SPST, N.O.  
 TERMINALS: PC pins for THT and G type for SMT  
 TRAVEL: 0.30 mm ± 0.15 mm

## Mechanical

OPERATING LIFE: 200,000 cycles  
 OPERATING FORCE: 180 gf ± 50  
 250 gf ± 50

## Electrical

MAX VOLTAGE: 12 VDC  
 MAX CURRENT: 50 mA  
 DIELECTRIC STRENGTH: 250 V AC (1mn)  
 CONTACT RESISTANCE: <100 mΩ  
 INSULATION RESISTANCE: >100MΩ  
 BOUNCE TIME: < 5 ms

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

## Environmental

OPERATING TEMPERATURE: -20°C to 70°C

## Process

SOLDERING: This component is suited to the following methods:  
 Infrared reflow soldering in accordance with IEC 61760-1 for SMT version  
 Wave soldering compatible with lead free soldering profile

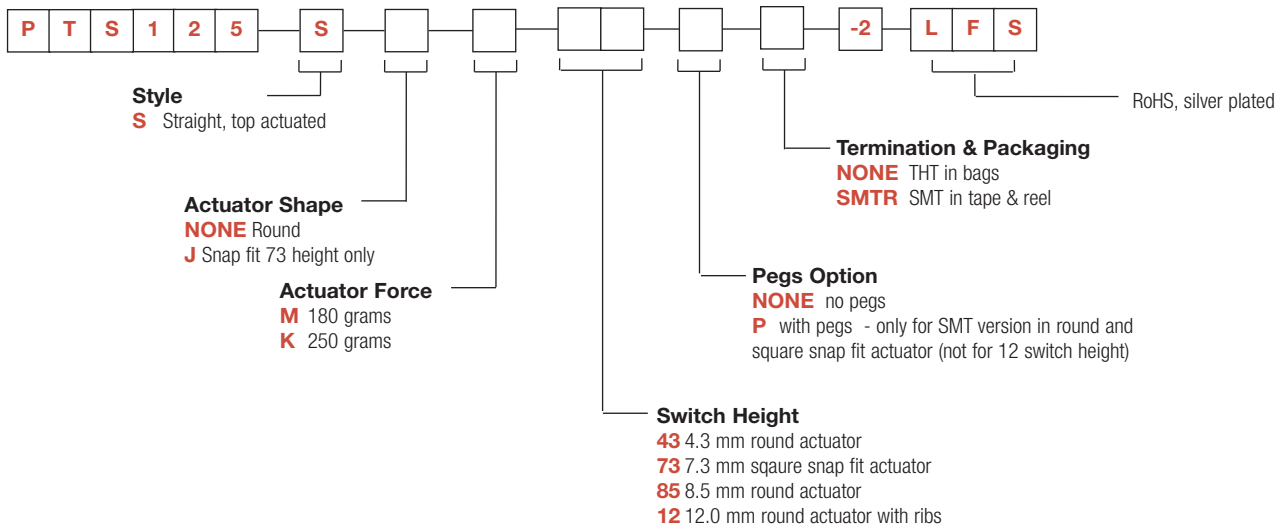
## Packaging

Soldering Style	Height	Packaging	Parts per Packaging
THT	All heights	Plastic bag	500
SMT	4.3 mm	tape & reel	900
SMT	4.3 mm with pegs	tape & reel	600
SMT	7.3 mm	tape & reel	500
SMT	7.3 mm with pegs	tape & reel	500
SMT	8.5 mm	tape & reel	500
SMT	8.5 mm with pegs	tape & reel	400
SMT	12 mm	tape & reel	250

Dimensions of reels according to EIA 481B. External diameter 330 mm.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



Other heights with the round actuator are available upon request. Different minimum order quantities than the stand may apply.



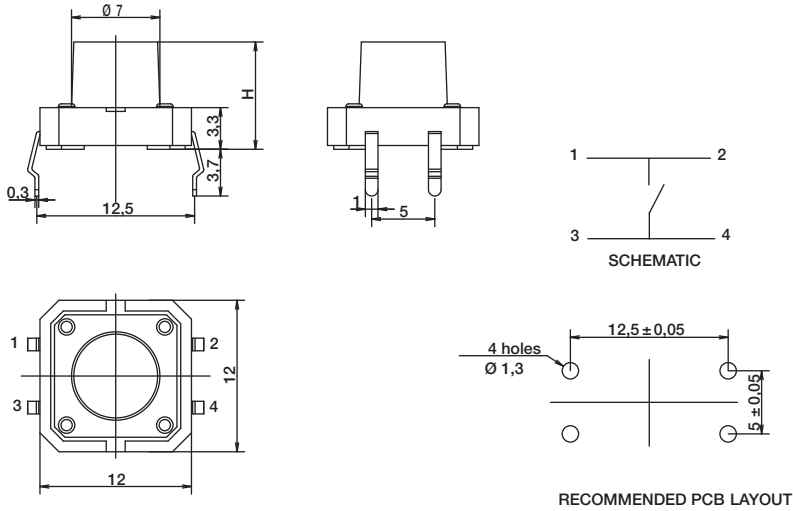
Dimensions are shown: mm  
 Specifications and dimensions subject to change

# PTS125 Series 12 mm Tact Switches

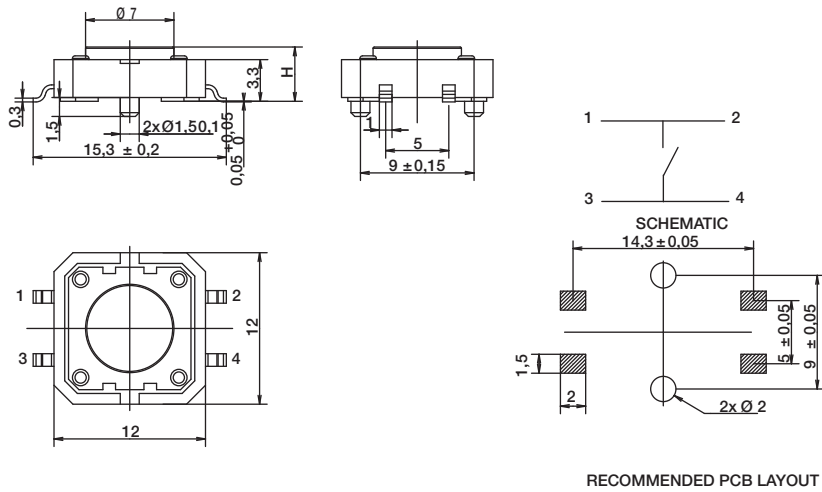
**THT** VERSION WITH ROUND ACTUATOR H= 4.3 & 8.5 MM (other height upon request)

B

Tactile Switches

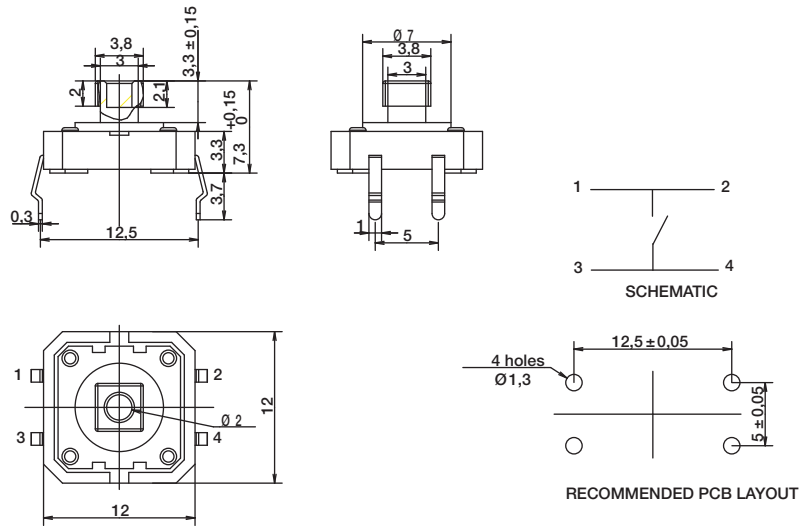


**SMT** VERSION WITH ROUND ACTUATOR AND PEGS H= 4.3 & 8.5 MM (other height upon request)

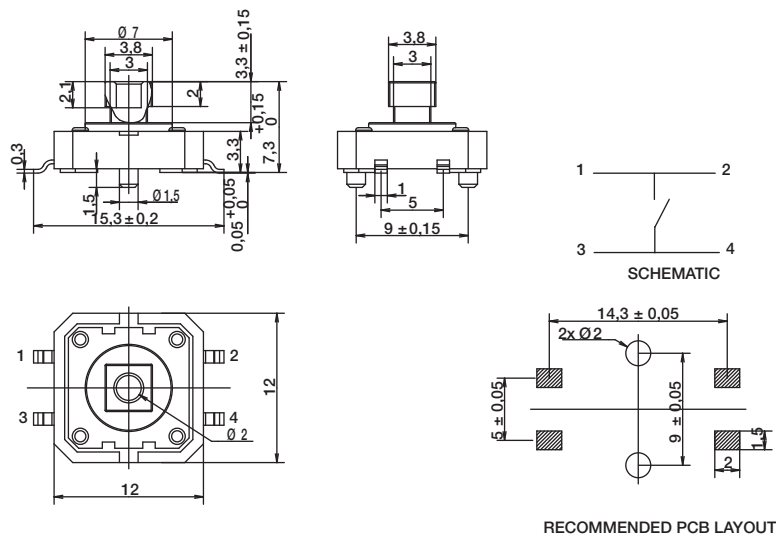


# PTS125 Series 12 mm Tact Switches

## THT VERSION WITH SQUARE SNAP FIT ACTUATOR H= 7.3 MM



## SMT VERSION WITH SQUARE SNAP FIT ACTUATOR AND PEGS H= 7.3 MM



B

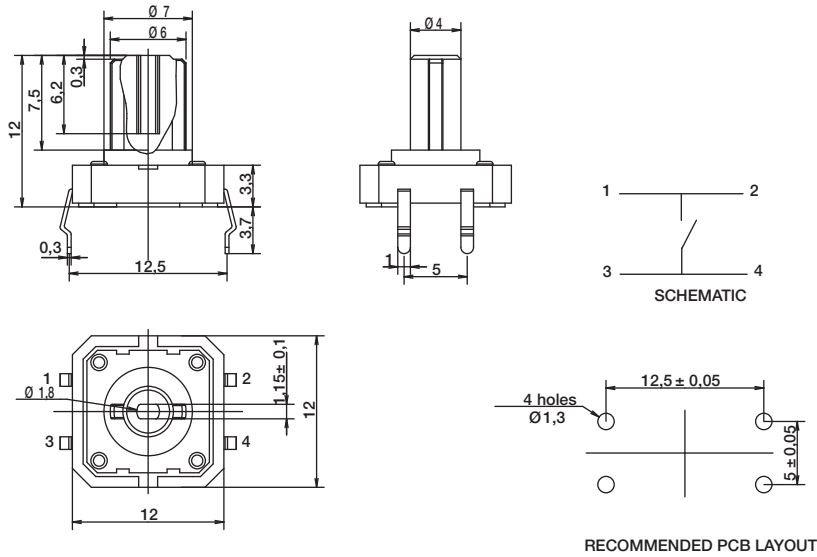
Tactile Switches

# PTS125 Series 12 mm Tact Switches

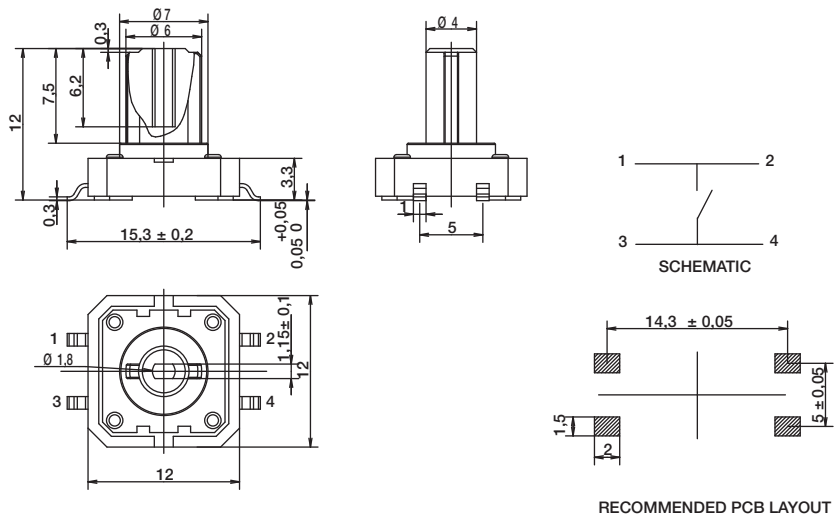
**THT** VERSION WITH ROUND RIBBED ACTUATOR H= 12.0 MM

Tactile Switches

B



**SMT** VERSION WITH ROUND RIBBED ACTUATOR H= 12.0 MM



# ITS Series Illuminated Tact Switch

## Features/Benefits

- Vertical and right angle SMT models
- Vertical and right angle thru-hole models
- Multiple caps and legends
- Several LED colors and bi-color options
- RoHS compliant /compatible

## Typical Applications

- Consumer electronics
- Server/storage
- Medical devices
- Test/Measurement/Instrumentation
- Audio/Video
- Computers/Peripherals
- Security

NEW  
Right  
Angle  
SMT



B

Tactile Switches

## Specification

FUNCTION: N.O. momentary action  
TERMINALS: SMT & Thru-hole

## Mechanical

OPERATING FORCE: 160 ± 50gf for V1; V2; V3; R1; R2 models  
220 ± 50 gf for R3 model  
OPERATING LIFE: 50,000 cycles (250m Ω max)  
RECOMMENDED OPERATING STROKE: 0.25mm ± 0.1mm

## Electrical

RATING: 50mA @ 12VDC  
CONTACT RESISTANCE: <100m Ω (initial)  
DIELECTRIC WITHSTANDING VOLTAGE:  
>250VAC (50-60 Hz) between terminals - 1 min.Ω  
INSULATION RESISTANCE: >100M Ω  
BOUNCE TIME: <10ms

## Packaging

Thru-hole: 200 pieces per tray  
SMT: tape & reel (see V2 or V3 mounting style drawings)

## Environmental

OPERATING TEMPERATURE: -25°C to +70°C  
STORAGE TEMPERATURE: -25°C to +80°C

## Process

SOLDERABILITY: Thru-hole - wave compatible  
SMT - convection or IR reflow compatible

## Materials

CONTACTS/TERMINALS: Base metal; brass  
Plating; Ag  
DOME: Base metal: Phosphor bronze  
Plating; Ag

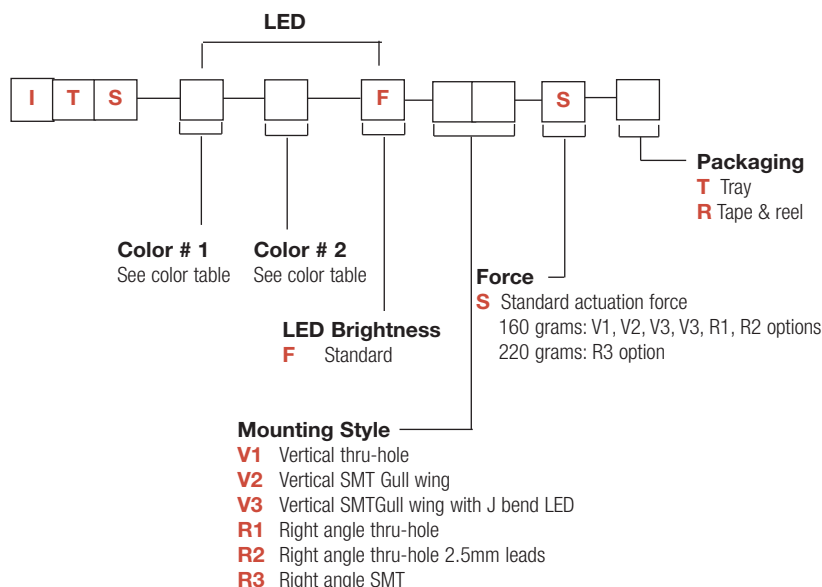
BASE: PA  
ACTUATOR: PA  
COVER: PA

## Caps

Caps are ordered separately and shipped bulk. Thru-hole versions available with caps assembled under custom part number. Contact customer service for details.

## How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.



LED Color	
00	No light
10	Red
12	Red/Yellow
13	Red/Green
14	Red/Blue
20	Yellow
21	Yellow/Red
23	Yellow/Green
30	Green
31	Green/Red
32	Green/Yellow
40	Blue
41	Blue/Red
50	White
60	True green

\* Other colors available by request

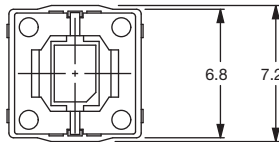
# ITS Series Illuminated Tact Switch

## LED COLOR / BRIGHTNESS

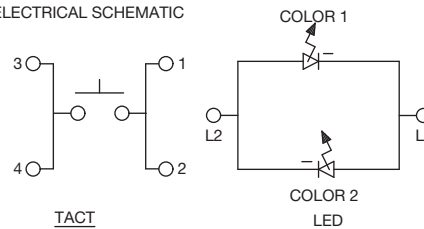
LED Characteristic	units	Standard LED Color Options					
		Red (1)	Yellow (2)	Green (3)	Blue (4)	White (5)	True Green (6)
Recommended Operating	mA @ 5VDC	20mA	20mA	20mA	20mA	20mA	20mA
Forward Current	mA	30 mA	30 mA	30 mA	30 mA	30 mA	30 mA
Peak Pulsing Current (1/8 duty @ 1kHz)	mA	125 mA	125 mA	125 mA	125 mA	125 mA	125 mA
Power Dissipation	mW	75 mW	75 mW	75 mW	108 mW	108 mW	108 mW
Forward Voltage @ 20mA	Volts	2.5 Volts Max.	2.5 Volts Max.	2.5 Volts Max.	3.6 Volts Max.	3.6 Volts Max.	3.6 Volts Max.
Dominant Wavelength @ 20mA	nm	637nm (Typical)	590nm (Typical)	570nm (Typical)	465nm (Typical)	CIE Coordinates X= 0.25 ~ 0.33 Y= 0.24 ~ 0.34	522nm (Typical)
Wavelength at Peak Emission @ 20mA	nm	645nm (Typical)	590nm (Typical)	573nm (Typical)	460nm (Typical)		515nm (Typical)
Spectral Half Bandwidth @ 20mA	nm	20nm (Typical)	20nm (Typical)	17nm (Typical)	25nm (Typical)		33nm (Typical)
Luminous Intensity @ 20mA	mcd	50mcd Minimum	125mcd Minimum	40mcd Minimum	100mcd Minimum	250mcd Minimum	500mcd Minimum
Viewing Angle at 50% LV (@10mA)	degrees	150° Typical	120° Typical	120° Typical	120° Typical	150° Typical	120° Typical

## MOUNTING STYLES

### V1 - Vertical Thru-hole



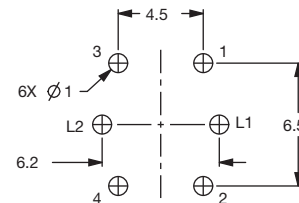
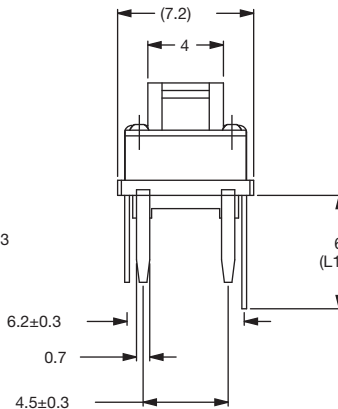
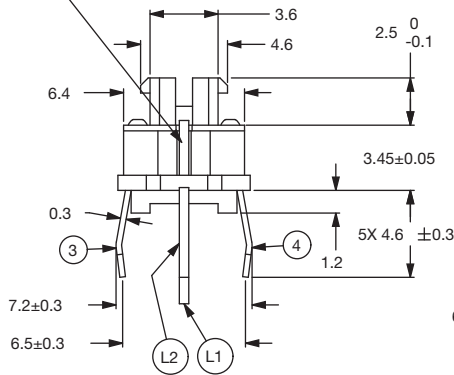
ELECTRICAL SCHEMATIC



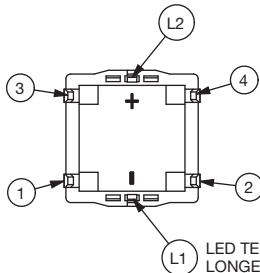
TACT

COLOR 2  
LED

DOT SHOWING LED COLOR IS MARKED FOR MINUS POLE SEE SCHEMATIC



P.C.B. LAYOUT



LED TERMINAL L1 IS TRIMMED LONGER THAN TERMINAL L2

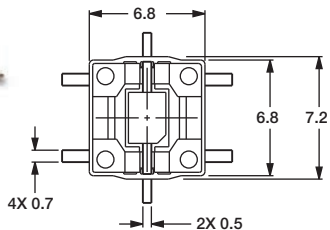
TRAY PACKAGING: 200 PIECES



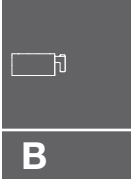
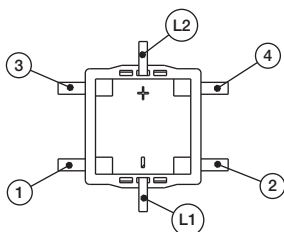
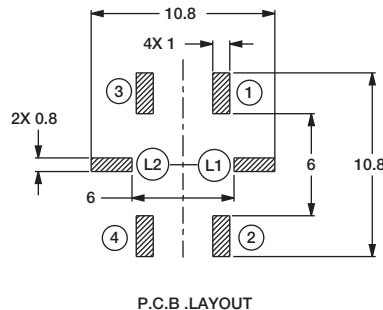
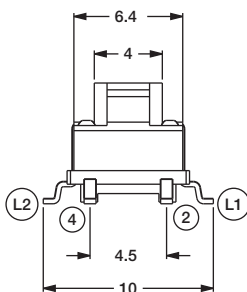
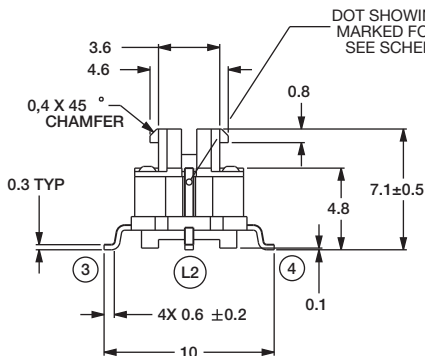
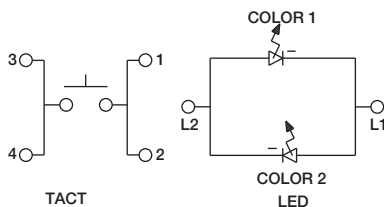
# ITS Series Illuminated Tact Switch

## MOUNTING STYLES

### V2 - Vertical SMT; Gullwing

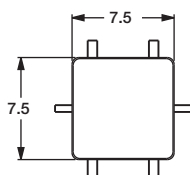


ELECTRICAL SCHEMATIC

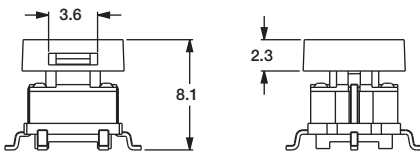


B

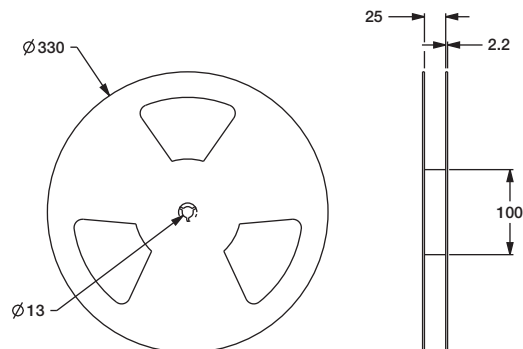
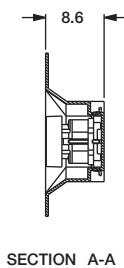
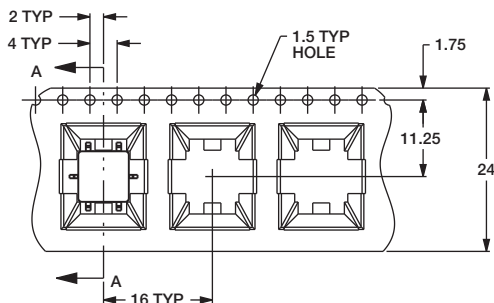
Tactile Switches



TAPE & REEL: 500 PIECES



NOTES:  
1. SWITCH WITH TEMPORARY PICK AND PLACE CAP.



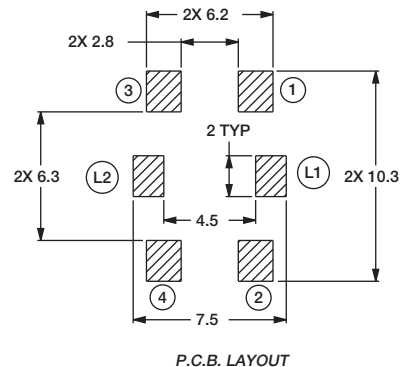
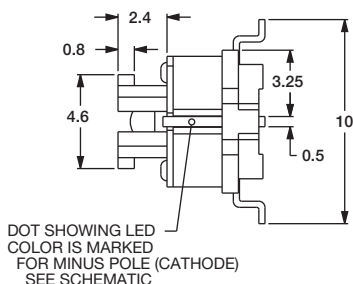
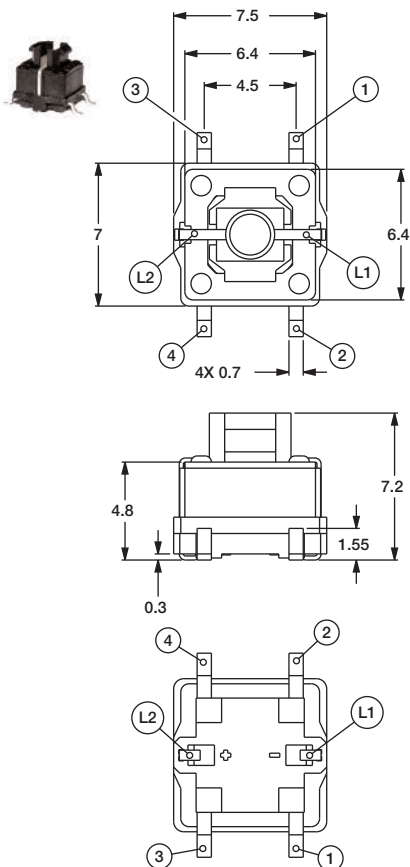
Dimensions are shown: mm  
Specifications and dimensions subject to change

# ITS Series Illuminated Tact Switch

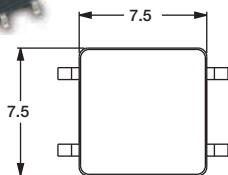
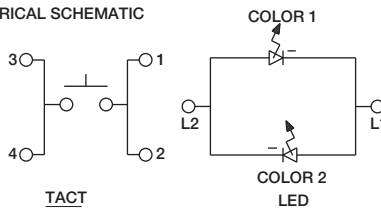
## MOUNTING STYLES

### V3 - Vertical SMT; Gull wing with J bend LED

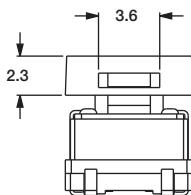
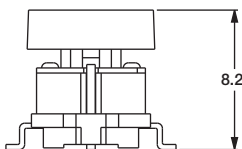
Tactile Switches



ELECTRICAL SCHEMATIC

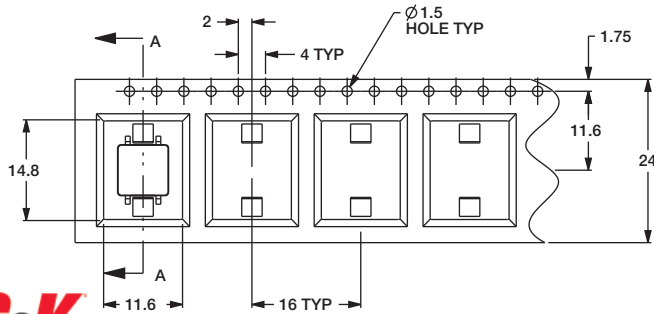


SCALE 3:1

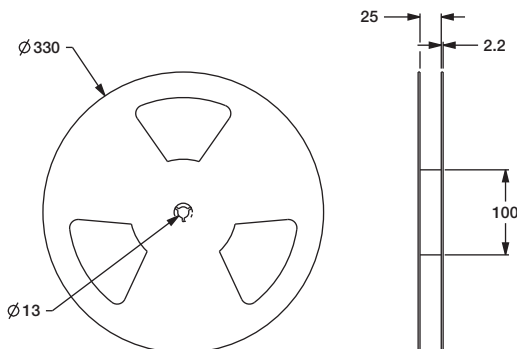
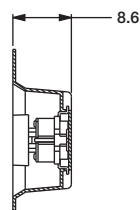


TAPE & REEL: 500 PIECES

NOTES:  
1. SWITCH WITH TEMPORARY PICK AND PLACE CAP.



SECTION A-A



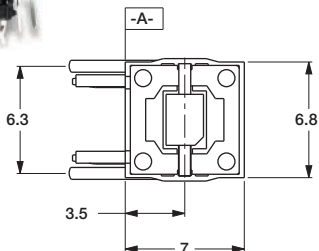
Dimensions are shown: mm  
Specifications and dimensions subject to change



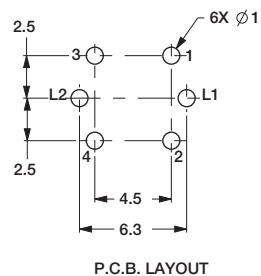
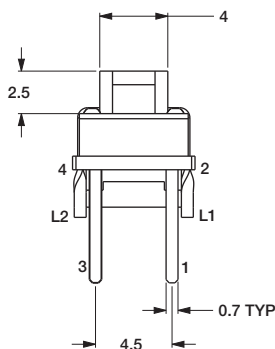
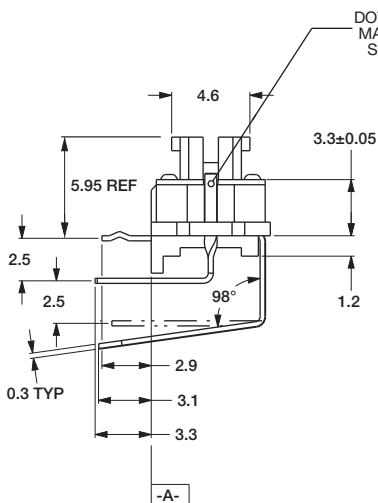
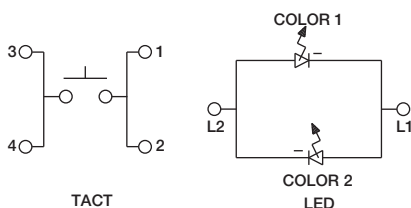
# ITS Series Illuminated Tact Switch

## MOUNTING STYLES

### R1 - Right Angle; Thru-hole

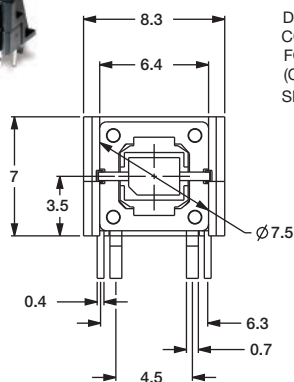


ELECTRICAL SCHEMATIC

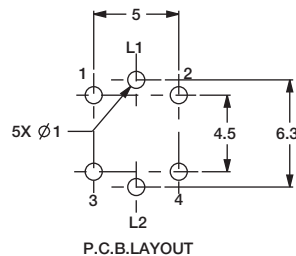
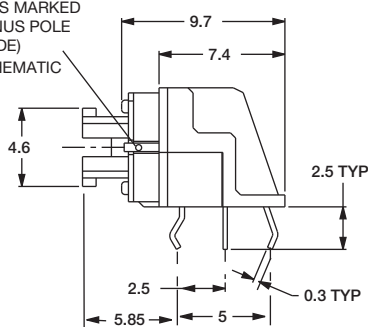


TRAY PACKAGING: 200 PIECES

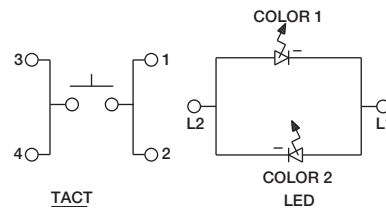
### R2 - Right Angle; Thru-hole 2.5mm leads



DOT SHOWING LED COLOR IS MARKED FOR MINUS POLE (CATHODE) SEE SCHEMATIC



ELECTRICAL SCHEMATIC



TRAY PACKAGING: 200 PIECES



Dimensions are shown: mm  
Specifications and dimensions subject to change



B

Tactile Switches

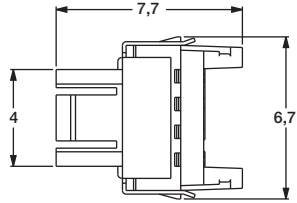
# ITS Series Illuminated Tact Switch

## MOUNTING STYLES

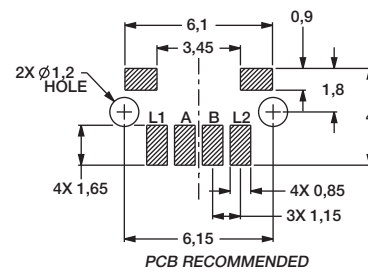
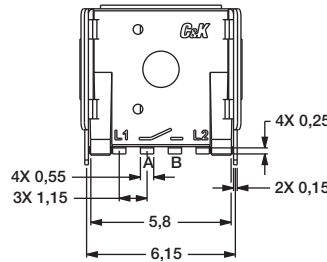
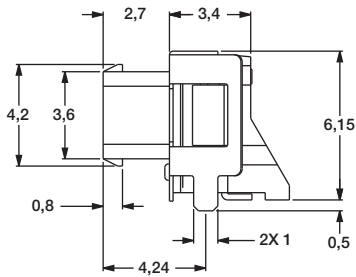
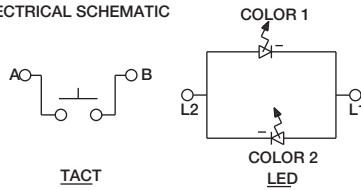
### R3 - Right Angle, SMT

B

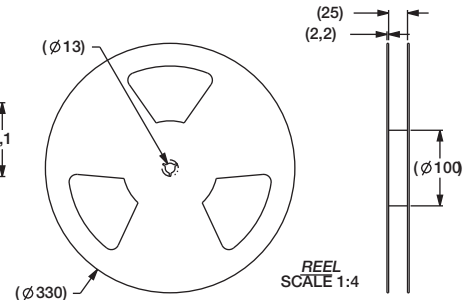
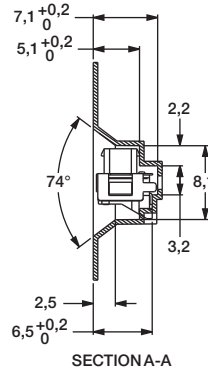
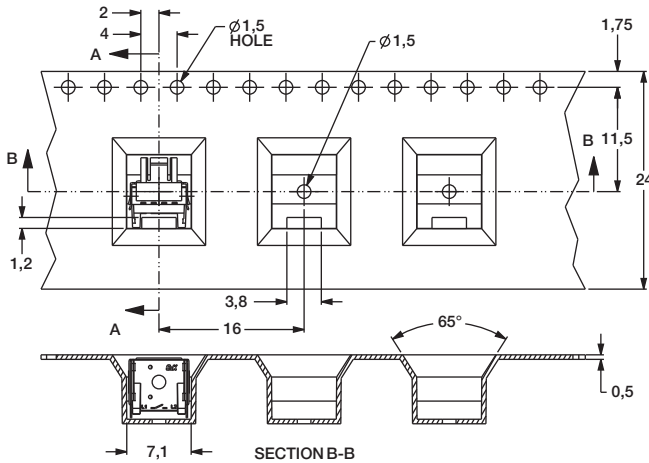
Tactile Switches



ELECTRICAL SCHEMATIC



TAPE & REEL: 500 PIECES



# ITS Series Illuminated Tact Switch

## FORCE

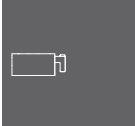
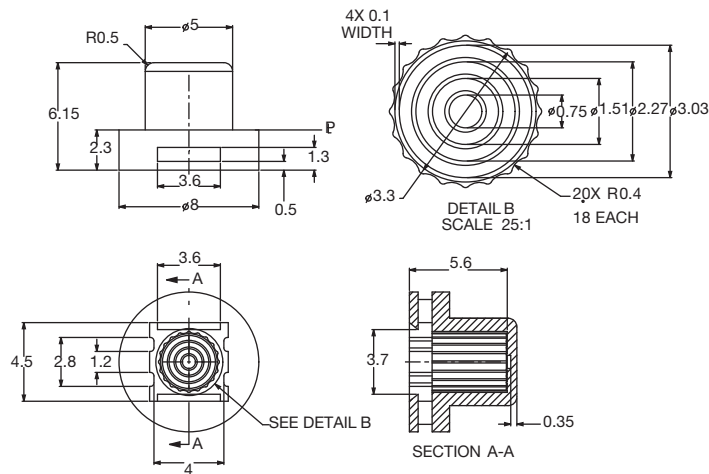
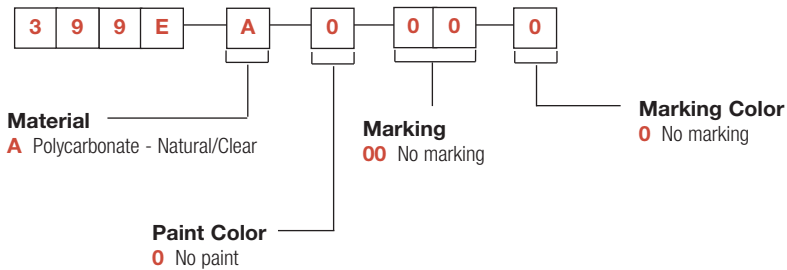
OPTION CODE	FORCE
<b>S</b>	Standard 160 gf - V1, V2, V3, R1, R2 options 220 gf - R3 option

## CAPS

Use the individual ordering code for each cap



**399EA0000**  
Round cap, clear



**B**

Tactile Switches

# ITS Series Illuminated Tact Switch

## CAPS



**400EA0000**

Natural/clear



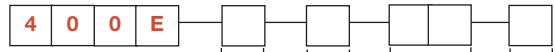
**400EB0000**

Translucent white, flat edge



**400ECA01E**

Matte silver paint laser etch, flat edge



### Material

- A** Natural/Clear - polycarbonate
- B** Translucent white - polycarbonate
- C** Silver paint laser etch - polycarbonate

### Paint Color

- 0** No paint
- A** Matte silver

### Laser Etch Marking

- 00** No marking
- 01** Power On/Off
- 04** Arrow right
- 05** Arrow left
- 06** Arrow up
- 07** Arrow down
- 09** Power
- 33** Arrow up (fill)
- 34** Arrow down (fill)
- 97** I/O



### Marking Color

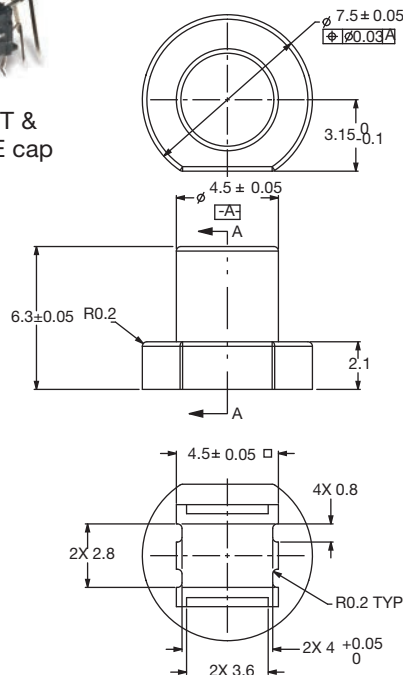
- 0** No marking
- E** Laser etch (painted caps only)

Tactile Switches

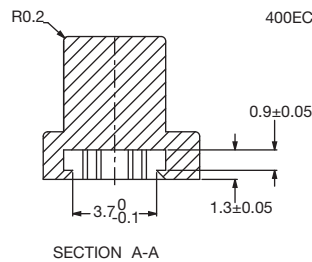
**B**



ITSXXFR1ST &  
400ECA01E cap



400ECA01E SHOWN



**400E cap dimensions shown are "as molded" (no paint).**

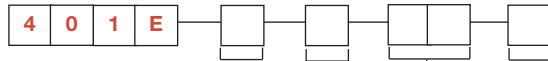
# ITS Series Illuminated Tact Switch

## CAPS



**401ECA06E**

Matte silver paint, laser etch,  
tall oval



**Material**

- A** Natural/clear - polycarbonate
- B** Translucent white - polycarbonate
- C** Paint laser etch - polycarbonate

**Paint Color**

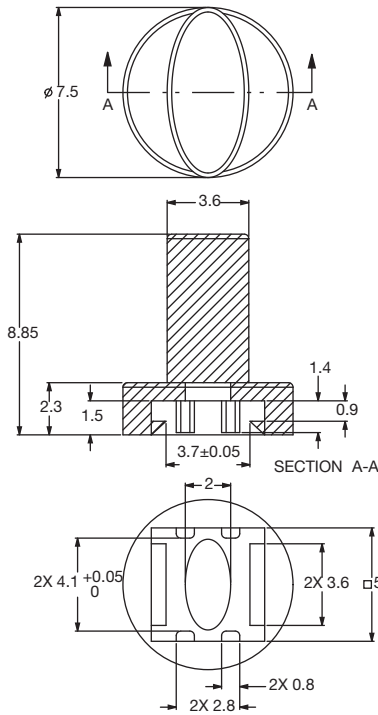
- 0** No paint
- A** Matte silver

**Laser Etch  
Marking**

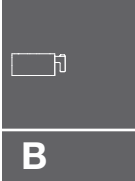
- 00** No marking
- 06** Arrow up
- 07** Arrow down
- 33** Arrow up (fill)
- 34** Arrow down (fill)

**Marking Color**

- 0** No marking
- E** Laser etch (painted caps only)



401E cap dimensions shown are "as molded" (no paint).



**B**

Tactile Switches

# KSH Series

## Soft Feeling High Tactile SMT Top Actuated

### Features/Benefits

- 6.3 x 6.3 x 5.0 mm footprint
- Low contact resistance
- High number of cycles
- 2 or 4 pin PCB layout

### Typical Applications

- Automotive Interior
- Car AV equipment
- Electronic musical instrument



### Specifications

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST N.O.  
 TERMINALS: J type for SMT  
 TRAVEL: 1.3 ± 0.2 mm

### Mechanical

Part Number	Operating Force (N)	Operating Life (operations)
KSH X11J 50 LFS	1.6 ± 0.5	200,000
KSH X21J 50 LFS	2.0 ± 0.6	200,000
KSH X31J 50 LFS	2.5 ± 0.8	200,000
KSH X41J 50 LFS	3.0 ± 1.0	200,000
KSH X51J 50 LFS	3.5 ± 1.2	100,000

### Electrical

MAXIMUM / MINIMUM VOLTAGE: 12 VDC / 2 VDC  
 MAXIMUM / MINIMUM CURRENT DC: 50 mA / 10 µA  
 DIELECTRIC STRENGTH: 250 VA C (1mm)  
 CONTACT RESISTANCE: ≤ 100 mΩ  
 INSULATION RESISTANCE: ≥ 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

### Environmental

OPERATING TEMPERATURE: -40°C to 90°C

### Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

### Packaging

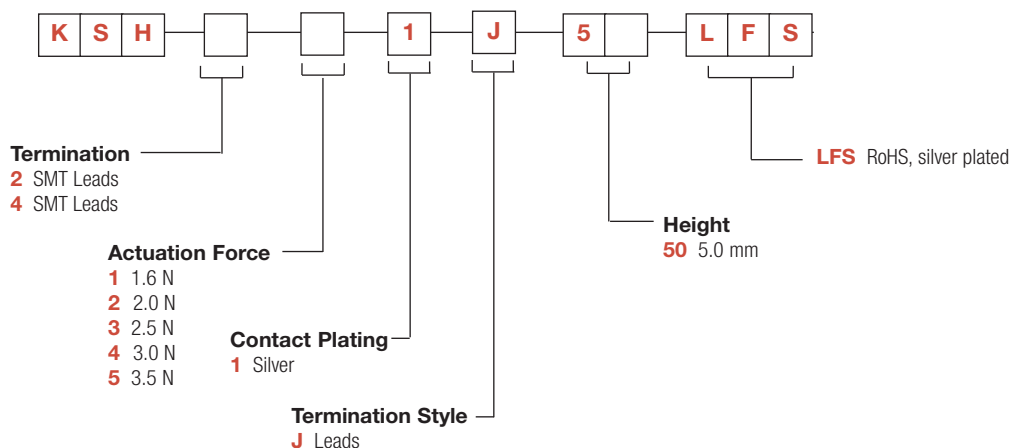
In reels of 1,000 pieces  
 Dimensions of reels according to EIA 481B  
 External diameter 330 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

### How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

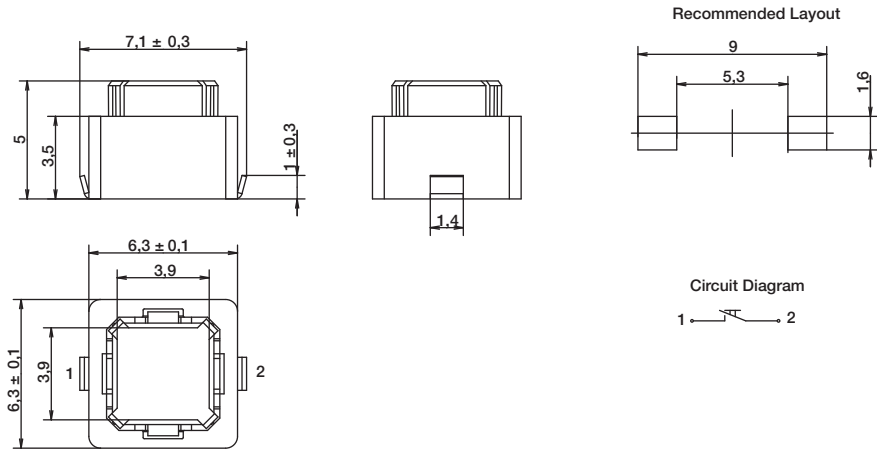
**For any part number different from those listed above, please consult your local representative.**



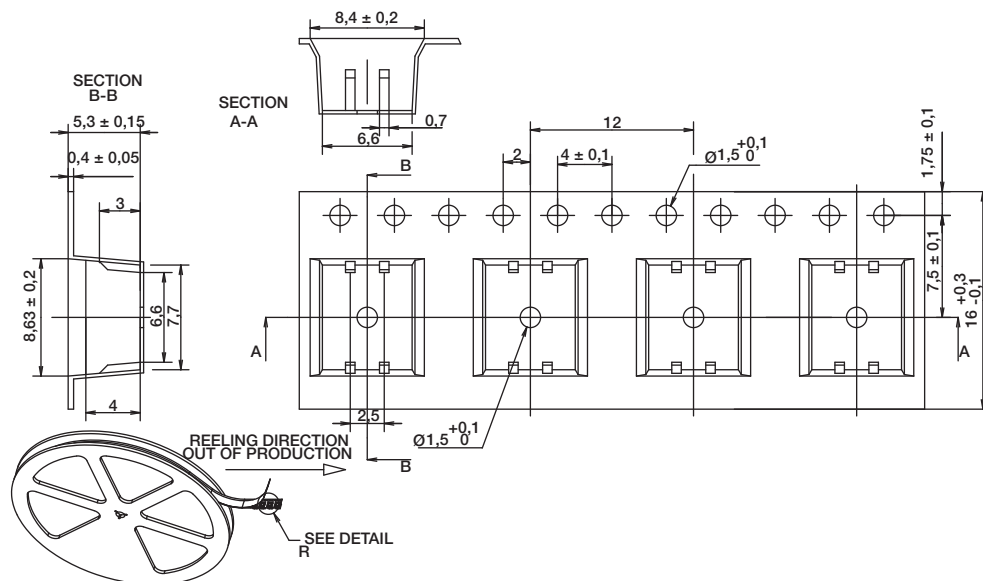
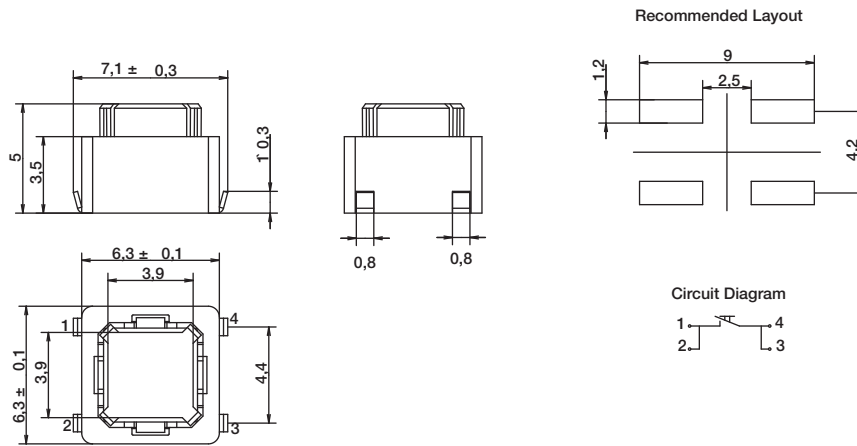


# KSH Series Soft Feeling High Tactile SMT Top Actuated

## KSH2



## KSH4



# KXT2 Series

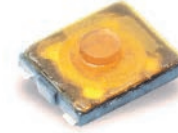
## Double Action Ultra Low Profile Top Actuated

### Features

- 3.9 x 3.0 mm footprint
- 1.05 mm thickness
- Dual action

### Typical Applications

- Wearable electronics
- Mobile Phones
- Portable Electronics



### Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: Dual action = SPDT, N.O.  
 TERMINALS: G type for SMT  
 TRAVEL: 0.1 mm ± 0.05 mm  
 TRAVEL: 0.2 mm + 0.1 / - 0.05 mm

### Mechanical

	Operating force gf		Operating Life
KXT 211 LHS	Push force 1	100 ± 40	100,000
	Push force 2	200 ± 50	

### Electrical

MAXIMUM VOLTAGE: 12 VDC  
 MAXIMUM CURRENT DC: 50 mA  
 DIELECTRIC STRENGTH: 250 V (50 Hz, 1 min.)  
 CONTACT RESISTANCE: ≤ 500 mΩ  
 INSULATION RESISTANCE: 100 MΩ  
 BOUNCE TIME: ≤ 10 ms

### Environmental

OPERATING TEMPERATURE: -40°C to 85°C  
 STORAGE TEMPERATURE: -40°C to 85°C

### Process

SOLDERING: This component is suited to the following methods:  
 Infrared Reflow Soldering in accordance with IEC61760-1

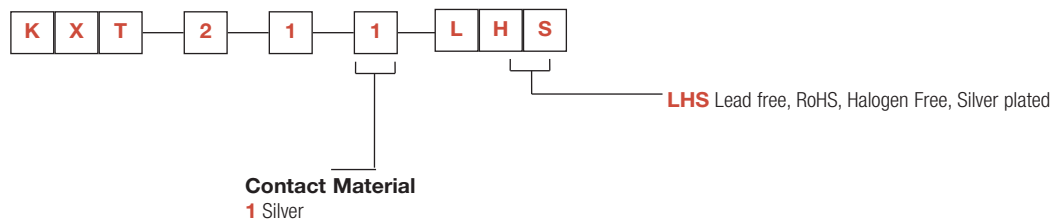
### Packaging

In reels of 6,000 pieces  
 Dimensions of reels according to EIA RS481 or IEC 2863  
 External diameter 178 mm ± 2mm

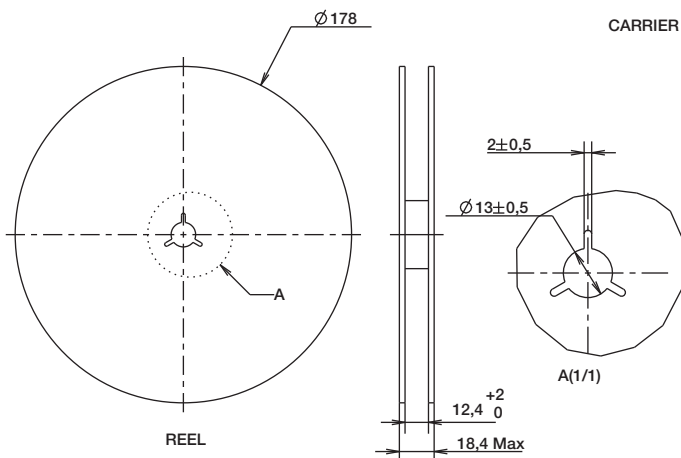
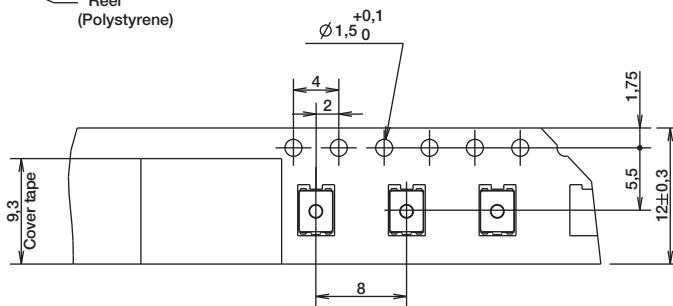
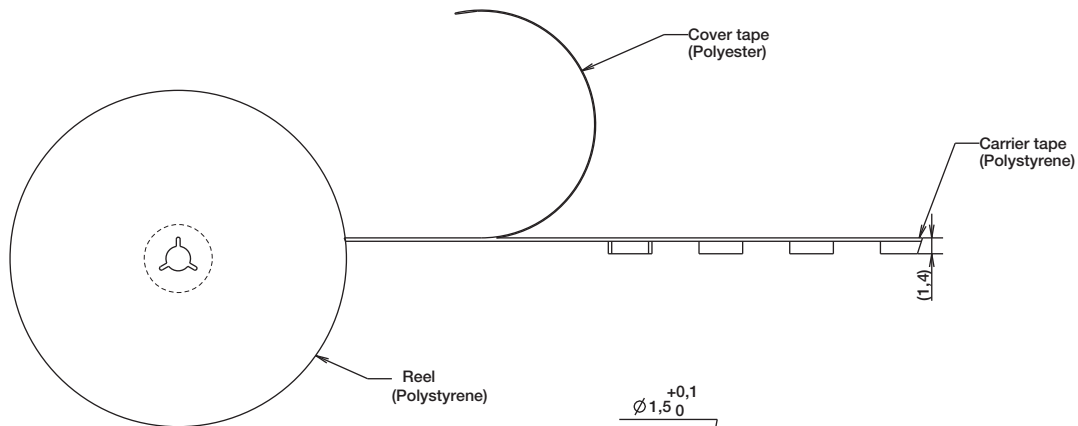
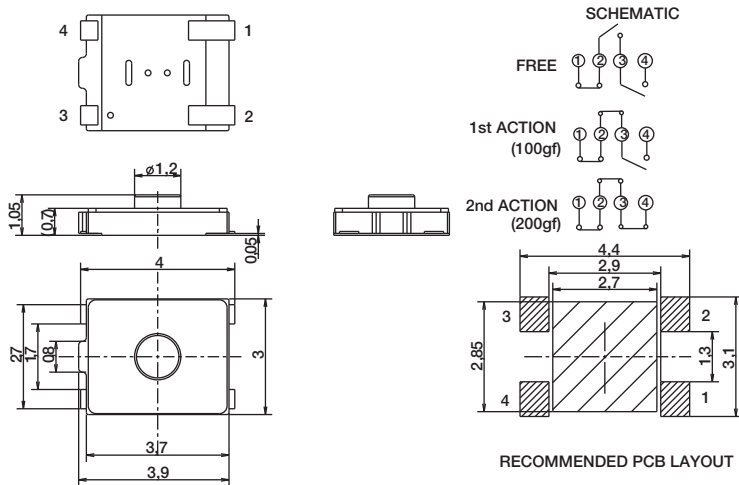
**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

### Part Number Description

For any part number different from those listed above, please consult your local representative.



# KXT2 Series Double Action Ultra Low Profile Top Actuated



Dimensions are shown: mm  
Specifications and dimensions subject to change

**B**  
Tactile Switches

# KMR 6 Series

## Microminiature SMT Top Actuated IP67

### Features/Benefits

- Watertight IP67
- Standard and long life versions
- No ground pin
- Ultra low current capabilities
- Excellent tactile feel

### Typical Applications

- Automotive
- Medical
- Consumer
- Industrial



B

Tactile Switches

### Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 TERMINALS: Gullwing type for SMT

### Mechanical

Type NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR611NG LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR611NG ULC LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR613NG LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR613NG ULC LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR621NG LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR621NG ULC LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR623NG LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR623NG ULC LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR631NG LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR631NG ULC LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR632NG LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR632NG ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR633NG LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR633NG ULC LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR641NG LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR641NG ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR642NG LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR642NG ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR643NG LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR643NG ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

### Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

\*For ULC version minimum current is 1µA at 1.8 VDC

### Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

### Process

Infrared Reflow Soldering in accordance with IEC61760-1

### Packaging

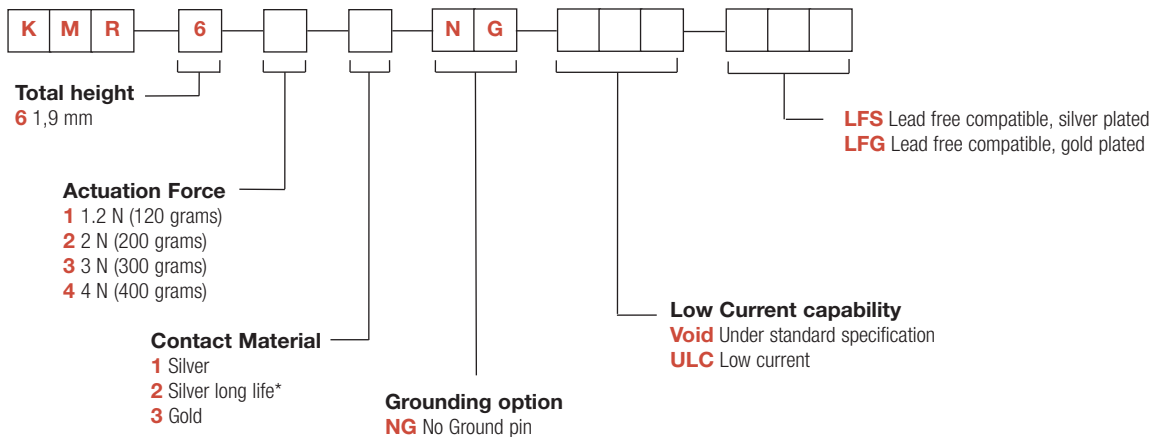
In reels of 7,000 pieces  
 External diameter 330 mm ± 2 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 6 series with actuation force in 2N - 3N - 4N: ≥ 30%  
 KMR 6 series with actuation force in 1.2N: ≥ 20%

### Part Number Description

For any part number different from those listed above, please consult your local representative.



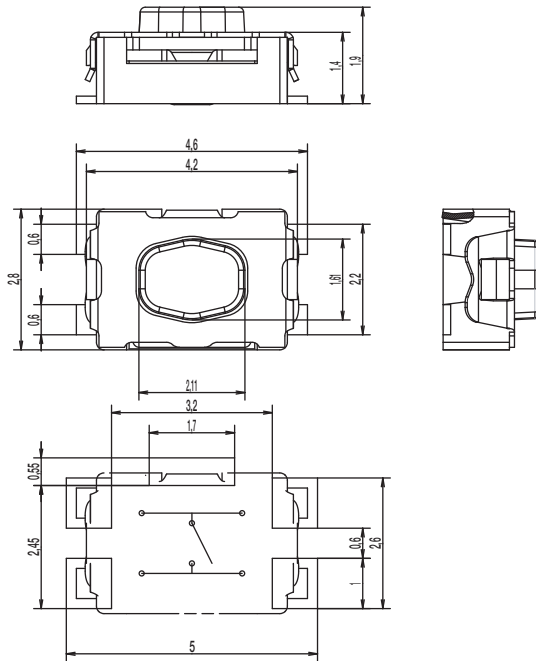
\* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.



# KMR 6 Series Microminiature SMT Top Actuated IP67

KMR 6 Series - 1.9 mm height

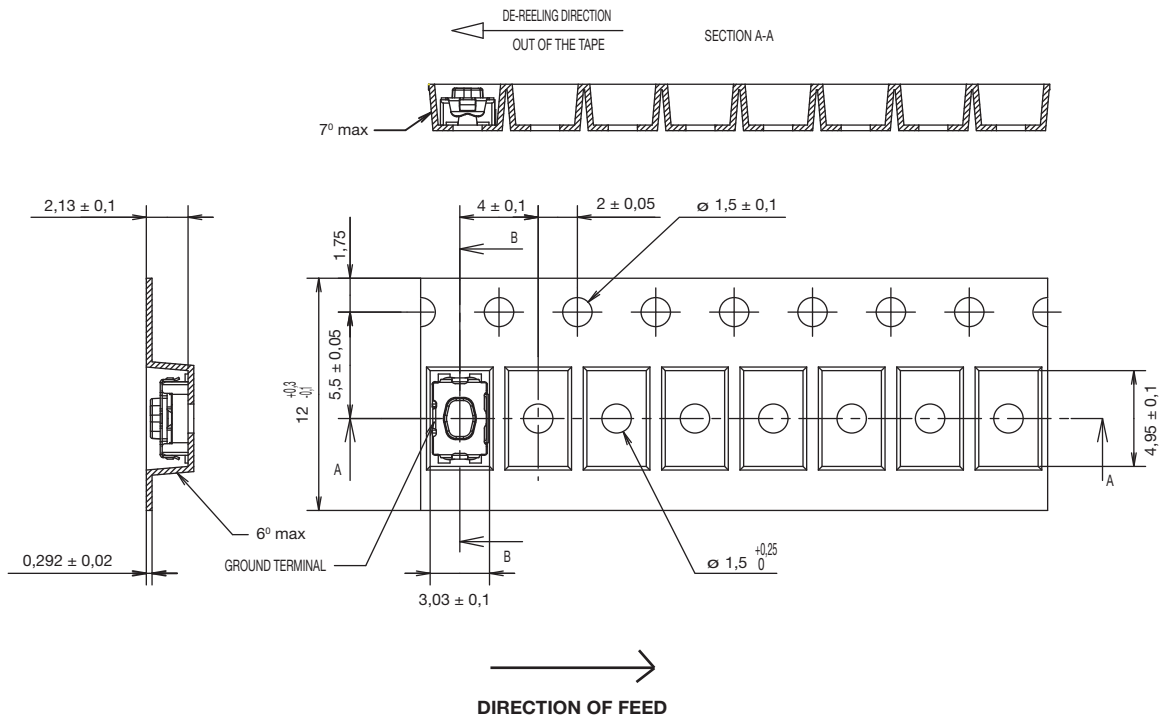
PCB layout shown with ground pin option



B

Tactile Switches

## TAPE & REEL



# KMR 7 Series

## Microminiature SMT Top Actuated IP67

### Features/Benefits

- Watertight IP67
- Standard and long life versions
- No ground pin
- Ultra low current capabilities
- Excellent tactile feel

### Typical Applications

- Automotive
- Medical
- Consumer
- Industrial



B

Tactile Switches

### Specification

FUNCTION: momentary action  
 CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.  
 TERMINALS: Gullwing type for SMT

### Mechanical

Type NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR711NG LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR711NG ULC LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR713NG LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR713NG ULC LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR721NG LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR721NG ULC LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR723NG LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR723NG ULC LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR731NG LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR731NG ULC LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR732NG LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR732NG ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR733NG LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR733NG ULC LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR741NG LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR741NG ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR742NG LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR742NG ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR743NG LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR743NG ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

### Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

\*For ULC version minimum current is 1µA at 1.8 VDC

### Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

### Process

Infrared Reflow Soldering in accordance with IEC61760-1

### Packaging

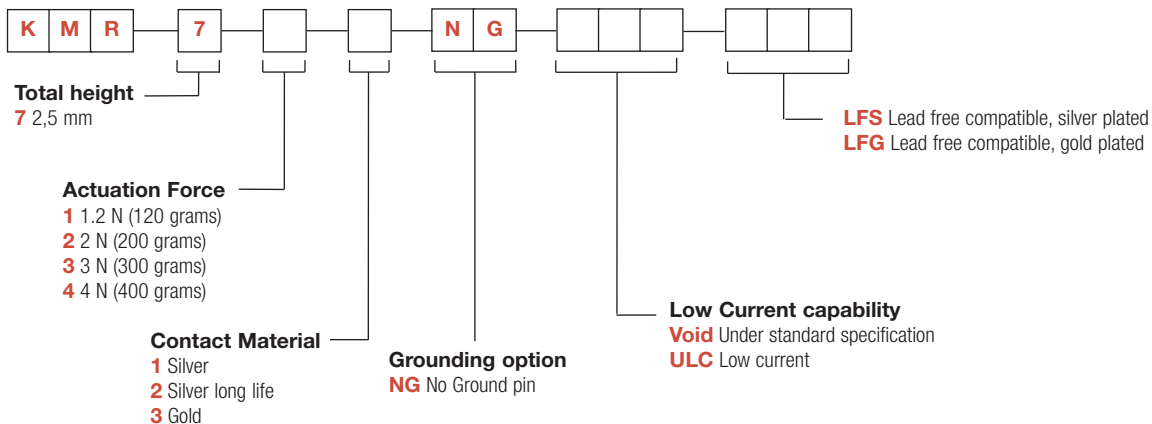
In reels of 6,000 pieces  
 External diameter 330 mm ± 2 mm

**NOTE:** Specifications listed above are for switches with standard options.  
 For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 7 series with actuation force in 2N - 3N - 4N: ≥ 25%  
 KMR 7 series with actuation force in 1.2N: ≥ 20%

### Part Number Description

For any part number different from those listed above, please consult your local representative.



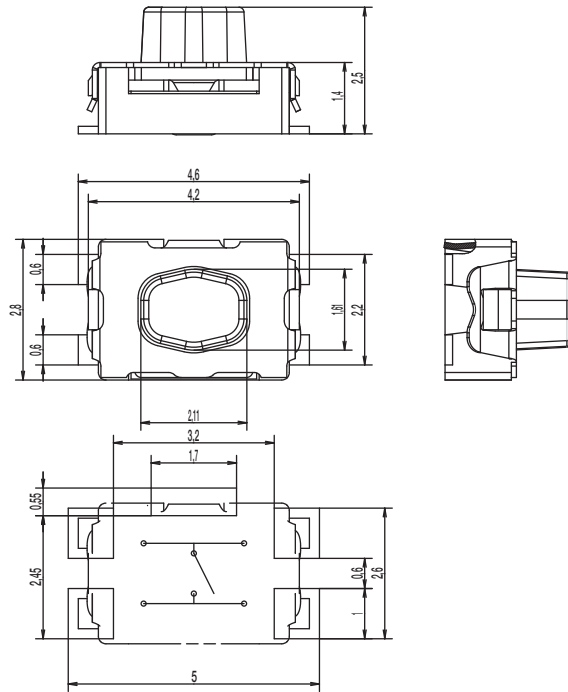
\* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.



# KMR 7 Series Microminiature SMT Top Actuated IP67

KMR 7 Series - 2.5 mm height

PCB layout shown with ground pin option



B

Tactile Switches

## TAPE & REEL

