

# Multilayer Ceramic Chip Capacitors

## Low ESL, Flipped type

### C series

Type:           C0510[EIA CC0204]  
                  C0816[EIA CC0306]  
                  C1220[EIA CC0508]  
                  C1632[EIA CC0612]

Issue date:     April 2007

- All specifications are subject to change without notice.
  - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
-

# REMINDERS

Please read this before using the product.

## SAFETY REMINDERS

### REMINDERS

1. If you intend to use a product listed in this catalog for a purpose that may cause loss of life or other damage, you must contact our company's sales window.
2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
3. We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
4. If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
6. We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
7. This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.
8. The descriptions in this catalog apply as of April 2007.

# LW Flipped Type Multilayer Ceramic Chip Capacitors

Conformity to RoHS Directive

## C Series C0510 (EIA CC0204) Type

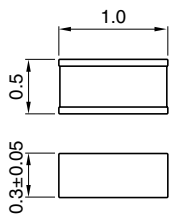
### FEATURES

- Positioning the electrodes along the length of the chip device, reduces ESR and ESL components over conventional products.
- Provides high frequency noise suppression effect because the resonating frequency is high.
- Target application : IC decoupling.

### APPLICATIONS

Personal computers, word processors, portable telephones, cordless telephones, camcorders, etc.

### SHAPES AND DIMENSIONS



Dimensions in mm



### PRODUCT IDENTIFICATION

C	0510	X6S	0G	104	M	□
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Series name

(2) Dimensions L×W

0510	0.5×1.0mm
------	-----------

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
X6S	±22%	-55 to +105°C
X5S	±22%	-55 to +85°C

(4) Rated voltage E<sub>dc</sub>

0G	4V
----	----

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

R designates a decimal point.

104	100,000pF
-----	-----------

(6) Capacitance tolerance

M	±20%
---	------

(7) Packaging style

T	Taping (reel)
B	Bulk

### CAPACITANCE RANGES: CLASS 2

#### TEMPERATURE CHARACTERISTICS: X6S(±22%), X5S(±22%)

RATED VOLTAGE E<sub>dc</sub>: 4V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: X6S	Temperature characteristics: X5S
100,000	±20%	0.30±0.05	C0510X6S0G104M	C0510X5S0G104M

- For more information about the products of other capacitance or data, please contact us.

- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

- All specifications are subject to change without notice.
- Please read the precautions before using this catalog.

# C Series C0816 (EIA CC0306) Type

Conformity to RoHS Directive

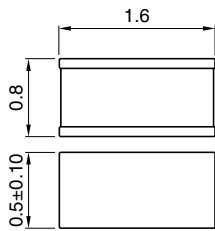
## FEATURES

- Positioning the electrodes along the length of the chip device, reduces ESR and ESL components over conventional products.
- Provides high frequency noise suppression effect because the resonating frequency is high.
- Target application : IC decoupling.

## APPLICATIONS

Personal computers, word processors, portable telephones, cordless telephones, camcorders, etc.

## SHAPES AND DIMENSIONS



Dimensions in mm



## PRODUCT IDENTIFICATION

C 0816 JB 1C 103 K □  
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

0816	0.8×1.6mm
------	-----------

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
JB	±10%	-25 to +85°C
X7R	±15%	-55 to +125°C
X5R	±15%	-55 to +85°C
X7S	±22%	-55 to +125°C

(4) Rated voltage E<sub>dc</sub>

1C	16V
1A	10V
0J	6.3V
0G	4V

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

R designates a decimal point.

104	100,000pF
-----	-----------

(6) Capacitance tolerance

K	±10%
M	±20%

(7) Packaging style

T	Taping (reel)
B	Bulk

## CAPACITANCE RANGES: CLASS 2

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)

RATED VOLTAGE E<sub>dc</sub>: 16V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
10,000	±10%	0.50±0.10	C0816JB1C103K	C0816X5R1C103K	C0816X7R1C103K
	±20%	0.50±0.10	C0816JB1C103M	C0816X5R1C103M	C0816X7R1C103M
22,000	±10%	0.50±0.10	C0816JB1C223K	C0816X5R1C223K	C0816X7R1C223K
	±20%	0.50±0.10	C0816JB1C223M	C0816X5R1C223M	C0816X7R1C223M
47,000	±10%	0.50±0.10	C0816JB1C473K	C0816X5R1C473K	C0816X7R1C473K
	±20%	0.50±0.10	C0816JB1C473M	C0816X5R1C473M	C0816X7R1C473M
100,000	±10%	0.50±0.10	C0816JB1C104K	C0816X5R1C104K	C0816X7R1C104K
	±20%	0.50±0.10	C0816JB1C104M	C0816X5R1C104M	C0816X7R1C104M

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

Please read the precautions before using this catalog.

**TEMPERATURE CHARACTERISTICS: JB( $\pm 10\%$ ), X5R( $\pm 15\%$ )**

 RATED VOLTAGE E<sub>dc</sub>: 10V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
220,000	$\pm 10\%$	0.50 $\pm$ 0.10	C0816JB1A224K	C0816X5R1A224K
	$\pm 20\%$	0.50 $\pm$ 0.10	C0816JB1A224M	C0816X5R1A224M

 RATED VOLTAGE E<sub>dc</sub>: 6.3V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
470,000	$\pm 10\%$	0.50 $\pm$ 0.10	C0816JB0J474K	C0816X5R0J474K
	$\pm 20\%$	0.50 $\pm$ 0.10	C0816JB0J474M	C0816X5R0J474M
1,000,000	$\pm 20\%$	0.50 $\pm$ 0.10	C0816JB0J105M	C0816X5R0J105M
2,200,000	$\pm 20\%$	0.50 $\pm$ 0.10	C0816JB0J225M	C0816X5R0J225M

**TEMPERATURE CHARACTERISTICS: X7S( $\pm 22\%$ )**

 RATED VOLTAGE E<sub>dc</sub>: 4V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: X7S	
470,000	$\pm 10\%$	0.50 $\pm$ 0.10	C0816X7S0G474K	
	$\pm 20\%$	0.50 $\pm$ 0.10	C0816X7S0G474M	
1,000,000	$\pm 20\%$	0.50 $\pm$ 0.10	C0816X7S0G105M	
2,200,000	$\pm 20\%$	0.50 $\pm$ 0.10	C0816X7S0G225M	

- For more information about the products of other capacitance or data, please contact us.

- All specifications are subject to change without notice.  
Please read the precautions before using this catalog.

# C Series C1220 (EIA CC0508) Type

Conformity to RoHS Directive

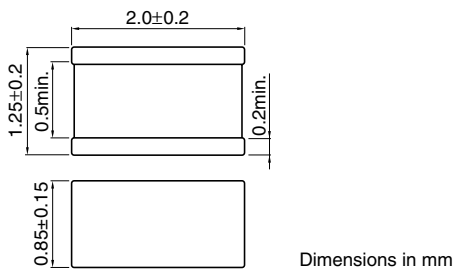
## FEATURES

- Positioning the electrodes along the length of the chip device, reduces ESR and ESL components over conventional products.
- Provides high frequency noise suppression effect because the resonating frequency is high.
- Target application : IC decoupling.

## APPLICATIONS

Personal computers, word processors, portable telephones, cordless telephones, camcorders, etc.

## SHAPES AND DIMENSIONS



## PRODUCT IDENTIFICATION

C 1220 JB 1E 104 K □  
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

1220	1.25×2.0mm
------	------------

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
JB	±10%	-25 to +85°C
X7R	±15%	-55 to +125°C
X5R	±15%	-55 to +85°C

(4) Rated voltage E<sub>dc</sub>

1H	50V
1E	25V
1C	16V
1A	10V
0J	6.3V

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

R designates a decimal point.

104	100,000pF
-----	-----------

(6) Capacitance tolerance

K	±10%
M	±20%

(7) Packaging style

T	Taping (reel)
B	Bulk

## CAPACITANCE RANGES: CLASS 2

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)

RATED VOLTAGE E<sub>dc</sub>: 50V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
10,000	±10%	0.85±0.15	C1220JB1H103K	C1220X5R1H103K	C1220X7R1H103K
	±20%	0.85±0.15	C1220JB1H103M	C1220X5R1H103M	C1220X7R1H103M
22,000	±10%	0.85±0.15	C1220JB1H223K	C1220X5R1H223K	C1220X7R1H223K
	±20%	0.85±0.15	C1220JB1H223M	C1220X5R1H223M	C1220X7R1H223M
47,000	±10%	0.85±0.15	C1220JB1H473K	C1220X5R1H473K	C1220X7R1H473K
	±20%	0.85±0.15	C1220JB1H473M	C1220X5R1H473M	C1220X7R1H473M

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.  
Please read the precautions before using this catalog.

**RATED VOLTAGE Edc: 25V**

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
100,000	±10%	0.85±0.15	C1220JB1E104K	C1220X5R1E104K	C1220X7R1E104K
	±20%	0.85±0.15	C1220JB1E104M	C1220X5R1E104M	C1220X7R1E104M

**RATED VOLTAGE Edc: 16V**

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
220,000	±10%	0.85±0.15	C1220JB1C224K	C1220X5R1C224K	C1220X7R1C224K
	±20%	0.85±0.15	C1220JB1C224M	C1220X5R1C224M	C1220X7R1C224M

**RATED VOLTAGE Edc: 6.3V**

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
470,000	±10%	0.85±0.15	C1220JB0J474K	C1220X5R0J474K	C1220X7R0J474K
	±20%	0.85±0.15	C1220JB0J474M	C1220X5R0J474M	C1220X7R0J474M
1,000,000	±20%	0.85±0.15	C1220JB0J105M	C1220X5R0J105M	C1220X7R0J105M

**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R(±15%)**
**RATED VOLTAGE Edc: 10V**

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
470,000	±10%	0.85±0.15	C1220JB1A474K	C1220X5R1A474K
	±20%	0.85±0.15	C1220JB1A474M	C1220X5R1A474M
1,000,000	±10%	0.85±0.15	C1220JB1A105K	C1220X5R1A105K
	±20%	0.85±0.15	C1220JB1A105M	C1220X5R1A105M

• For more information about the products of other capacitance or data, please contact us.

• All specifications are subject to change without notice.

Please read the precautions before using this catalog.

# C Series C1632 (EIA CC0612) Type

Conformity to RoHS Directive

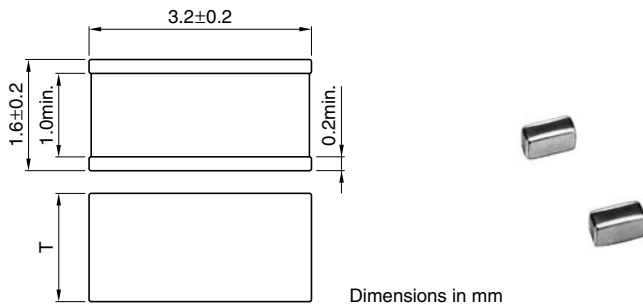
## FEATURES

- Positioning the electrodes along the length of the chip device, reduces ESR and ESL components over conventional products.
- Provides high frequency noise suppression effect because the resonating frequency is high.
- Target application : IC decoupling.

## APPLICATIONS

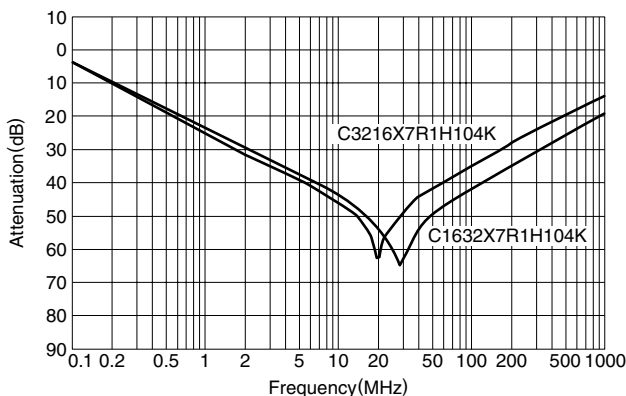
Personal computers, word processors, portable telephones, cordless telephones, camcorders, etc.

## SHAPES AND DIMENSIONS



## TYPICAL ELECTRICAL CHARACTERISTICS

### ATTENUATION vs. FREQUENCY CHARACTERISTICS



## PRODUCT IDENTIFICATION

C 1632 JB 1H 103 K □  
 (1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

1632	1.6×3.2mm
------	-----------

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
JB	±10%	-25 to +85°C
X7R	±15%	-55 to +125°C
X5R	±15%	-55 to +85°C
X7S	±22%	-55 to +125°C

(4) Rated voltage E<sub>dc</sub>

1H	50V
1E	25V
1C	16V
1A	10V
0J	6.3V
0G	4V

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

R designates a decimal point.

104	100,000pF
-----	-----------

(6) Capacitance tolerance

K	±10%
M	±20%

(7) Packaging style

T	Taping (reel)
B	Bulk

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.  
 Please read the precautions before using this catalog.



**CAPACITANCE RANGES: CLASS 2****TEMPERATURE CHARACTERISTICS: JB( $\pm 10\%$ ), X5R/X7R( $\pm 15\%$ )**RATED VOLTAGE E<sub>dc</sub>: 50V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
10,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1H103K	C1632X5R1H103K	C1632X7R1H103K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1H103M	C1632X5R1H103M	C1632X7R1H103M
22,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1H223K	C1632X5R1H223K	C1632X7R1H223K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1H223M	C1632X5R1H223M	C1632X7R1H223M
47,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1H473K	C1632X5R1H473K	C1632X7R1H473K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1H473M	C1632X5R1H473M	C1632X7R1H473M
100,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1H104K	C1632X5R1H104K	C1632X7R1H104K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1H104M	C1632X5R1H104M	C1632X7R1H104M
220,000	$\pm 10\%$	1.15 $\pm$ 0.15	C1632JB1H224K	C1632X5R1H224K	C1632X7R1H224K
	$\pm 20\%$	1.15 $\pm$ 0.15	C1632JB1H224M	C1632X5R1H224M	C1632X7R1H224M

RATED VOLTAGE E<sub>dc</sub>: 25V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
220,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1E224K	C1632X5R1E224K	C1632X7R1E224K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1E224M	C1632X5R1E224M	C1632X7R1E224M
470,000	$\pm 10\%$	1.15 $\pm$ 0.15	C1632JB1E474K	C1632X5R1E474K	C1632X7R1E474K
	$\pm 20\%$	1.15 $\pm$ 0.15	C1632JB1E474M	C1632X5R1E474M	C1632X7R1E474M

RATED VOLTAGE E<sub>dc</sub>: 16V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
470,000	$\pm 10\%$	0.7 $\pm$ 0.10	C1632JB1C474K	C1632X5R1C474K	C1632X7R1C474K
	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1C474M	C1632X5R1C474M	C1632X7R1C474M
1,000,000	$\pm 10\%$	1.15 $\pm$ 0.15	C1632JB1C105K	C1632X5R1C105K	C1632X7R1C105K
	$\pm 20\%$	1.15 $\pm$ 0.15	C1632JB1C105M	C1632X5R1C105M	C1632X7R1C105M

RATED VOLTAGE E<sub>dc</sub>: 6.3V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.		
			Temperature characteristics: JB	Temperature characteristics: X5R	Temperature characteristics: X7R
1,000,000	$\pm 20\%$	0.70 $\pm$ 0.10	C1632JB0J105M	C1632X5R0J105M	C1632X7R0J105M
2,200,000	$\pm 20\%$	1.15 $\pm$ 0.15	C1632JB0J225M	C1632X5R0J225M	C1632X7R0J225M

**TEMPERATURE CHARACTERISTICS: JB( $\pm 10\%$ ), X5R( $\pm 15\%$ )**RATED VOLTAGE E<sub>dc</sub>: 10V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
1,000,000	$\pm 20\%$	0.7 $\pm$ 0.10	C1632JB1A105M	C1632X5R1A105M
2,200,000	$\pm 20\%$	1.15 $\pm$ 0.15	C1632JB1A225M	C1632X5R1A225M

RATED VOLTAGE E<sub>dc</sub>: 6.3V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
4,700,000	$\pm 20\%$	1.30 $\pm$ 0.15	C1632JB0J475M	C1632X5R0J475M
10,000,000	$\pm 20\%$	1.30 $\pm$ 0.15	C1632JB0J106M	C1632X5R0J106M

**TEMPERATURE CHARACTERISTICS: X7S( $\pm 22\%$ )**RATED VOLTAGE E<sub>dc</sub>: 4V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.
			Temperature characteristics: X7S
4,700,000	$\pm 20\%$	1.30 $\pm$ 0.15	C1632X7S0G475M
10,000,000	$\pm 20\%$	1.30 $\pm$ 0.15	C1632X7S0G106M

- For more information about the products of other capacitance or data, please contact us.

- All specifications are subject to change without notice.  
Please read the precautions before using this catalog.