

3M™ Cable

Cable Properties — Internal Wiring

		Internal Wiring					
		Round Conductor Flat Cable					
	Typical Cable Properties	3447 Series	3749 Series	3754 Series	2049 Series	3604 Series	3756 Series
1	Jacket Material	—	—	—	—	—	—
2	Jacket Color	—	—	—	—	—	—
3	Shield	—	—	—	—	—	—
4	Primary Insulation Material	PVC	TPE	PVC	PO	FEP	TPE
5	Primary Color	Gray	Gray	Gray	Off-White	Opaque White	Gray
6	First Conductor Marking	Red	Blue	Red	Blue	Blue	Blue
7	Conductor Spacing inch (mm)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)
8	Conductor Size	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG
9	Conductor Stranding	Solid (0.254)	Solid (0.254)	7 × 38 (7 × 0.102)	Solid (0.254)	Solid (0.254)	7 × 38 (7 × 0.102)
10	Conductor Material	Copper	Copper	Copper	Copper	Copper	Copper
11	Conductor Resistance @ 20C Ohms / 1000 ft. [Ohms / km]						
		112 (366)	112 (366)	101 (333)	112 (366)	104 (341)	101 (333)
12	Conductor Quantity (For others, contact your sales representative)	20, 26, 34,36,40,50, 60, 68, 80, 100	20, 26, 34, 36, 40, 50, 60, 68, 80, 100	20, 26, 34, 36, 40, 50, 60, 68, 80, 100	20, 26, 34, 36, 40, 50, 60, 68, 80, 100	20, 26, 36, 40, 50, 60, 68, 80, 100	20, 26, 34, 36, 40, 50, 60, 68, 80, 100
13	Impedance (Ohms) Unbalanced Balanced						
		81 136	90 —	73 122	83 137	99 165	82 138
14	Capacitance pF / ft [pF / m] Unbalanced Balanced						
		19.1 (62.7) 11.0 (36.1)	16.5 (54.1) —	20.8 (68.2) 12.0 (39.4)	19.0 (62.3) 11.1 (36.4)	13.8 (45.3) 8.2 (26.9)	17.3 (56.8) 10.0 (32.8)
15	Inductance μH / ft [μH / m] Unbalanced Balanced						
		.13 (0.43) .20 (0.66)	.13 (0.43) —	.11 (0.36) .18 (0.59)	.13 (0.43) .21 (0.69)	.14 (0.46) .23 (0.75)	.12 (0.39) .19 (0.62)
16	Signal Speed Propagation Delay ns / ft. [ns / m] Unbalanced Balanced Velocity of Propagation % Unbalanced Balanced						
		1.55 (5.09) 1.49 (4.89)	1.48 (4.86) —	1.51 (4.95) 1.45 (4.76)	1.58 (5.18) 1.52 (4.99)	1.38 (4.53) 1.36 (4.46)	1.42 (4.66) 1.38 (4.53)
		66 68	69 —	67 70	64 67	74 75	72 74
17	Insulation Resistance Ohms / 10 ft. [3 m]	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰
18	Voltage Rating US Canada Europe						
		30	150	30	30	150	150
		30	150	30	—	—	150
19	Temperature Rating US Canada	-20C to +105C	-40C to +105C	-20C to +105C	-40C to +105C	-55C to +150C	-40C to +105C
		-20C to +105C	-40C to +105C	-20C to +105C	-40C to +105C	—	-40C to +105C
20	UL Listing - US	AWM	AWM	AWM	AWM	AWM	AWM
		Style 20596	Style 20297	Style 20596	Style 20930	Style 20726	Style 20297
21	UL Listing - Canada	Optional	Optional	Optional			Optional
		IA	IA	IA	—	—	IA
		105C 30V FT1	105C 150V FT1	105C 30V FT1			105C 150V FT1
22	Catalog Tech Sheets	TS-0830	TS-0068	TS-0875	TS-0886	TS-0653	TS-0508

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3M™ Cable

Cable Properties - Internal Wiring

Internal Wiring									
Round Conductor Flat Cable									
	3609 Series	3849 Series	3625 Series	3709 Series	3365 Series	3667 Series	3355 Series	2010 Series	3601 Series
1	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—
4	FEP	PVC	PVC	PVC	PVC	PVC	TPE	PO	FEP
5	Opaque White	Gray	Gray	Gray	Gray/Black	Gray	Gray	Off-white	Opaque White
6	Blue	Red	Red	Red	Red	Red	Blue	Blue	Blue
7	.025 (0.64)	.033 (0.85)	1.0mm (.039 in.)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)
8	30 AWG	30 AWG	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG
9	7 × 38 (7 × 0.102)	7 X 38 (7 × 0.102)	7 × 36 (7 × 0.127)	Solid (0.32)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)
10	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper
11	94	101	65	69	65	65	65	65	60
	(310)	(333)	(213)	(228)	(213)	(213)	(213)	(213)	(198)
12	20, 26, 36, 40, 50, 60, 68, 80, 100	96	06, 08, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	06, 08, 09, 10, 12, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 44, 50, 60, 64	10, 14, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 44, 50, 60, 64	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	10, 15, 20, 25, 26, 34, 40, 50, 60
13	91	89	92	114	108	112	117	107	131
	—	144	146	188	—	—	—	176	—
14	14.7 (48.2)	17.5 (57.4)	54.5 (16.6)	12.8 (42.0)	12.8 (42.0)	12.7 (41.5)	11.7 (38.4)	14.0 (45.93)	9.9 (32.5)
	—	10.5 (34.5)	32.2 (9.8)	7.4 (24.3)	—	—	—	8.2 (26.95)	—
15	.12 (0.39)	.14 (0.46)	0.46 (.14)	.17 (0.56)	.15 (0.50)	.16 (0.52)	.16 (0.52)	.16 (0.53)	.17 (0.56)
	—	.22 (0.72)	0.69 (.21)	.26 (0.85)	—	—	—	.25 (0.84)	—
16	1.34 (4.40)	1.56 (5.12)	4.86 (1.48)	1.45 (4.76)	1.40 (4.59)	1.42 (4.66)	1.37 (4.49)	1.50 (4.92)	1.29 (4.23)
	—	1.51 (4.95)	4.69 (1.43)	1.40 (4.59)	—	—	—	1.45 (4.76)	—
	76	65	69	70	73	72	74	68	79
	—	67	71	73	—	—	—	70	—
	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰
18	150	300	300	300	300	300	300	30	300
	—	300	300	300	300	300	—	—	—
	<50	<50	<50	<50	<50	<50	<50	<50	<50
19	-55C to +150C	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +105C	-40C to +105C	-40C to +105C	-55C to +200C
	—	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +105C	—	—	—
20	AWM	AWM	AWM	AWM	AWM	AWM	AWM	AWM	AWM
	Style 20726	Style 2651	2651	Style 2651	Style 2651	Style 2651	Style 20297	Style 20930	Style 20424
21	Optional	Optional	Optional	Optional	Optional	Optional	—	—	—
	—	IA	IA	IA	IA	IA	—	—	—
22	TS-0654	TS-0573	TS-0452	TS-0419	TS-0080	TS-0247	TS-0317	TS-0722	TS-0553

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Cable Properties — Internal Wiring

		Internal Wiring					
		Round Conductor Flat Cable					
	Typical Cable Properties	3306 Series	3801 Series	3770 Series	8125 Series	8124 Series	8132 Series
1	Jacket Material	—	—	—	—	—	—
2	Jacket Color	—	—	—	—	—	—
3	Shield	—	—	—	—	—	—
4	Primary Insulation Material	PVC	PVC	TPE	PVC	PVC	PVC
5	Primary Color	Gray	Gray/Black	Gray	Dark Gray	Dark Gray	Dark Gray
6	First Conductor Marking	Red	Red	Blue	Red	Red	Red
7	Conductor Spacing inch (mm)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.100 (2.54)	.100 (2.54)	.156 (3.96)
8	Conductor Size	26 AWG	26 AWG	26 AWG	24 AWG	22 AWG	18 AWG
9	Conductor Stranding	Solid (0.404)	7 × 34 (7 × 0.160)	7 × 34 (7 × 0.160)	7 × 32 (7 × 0.203)	7 × 30 (7 × 0.254)	19 × 30 (19 × 0.254)
10	Conductor Material	Copper	Copper	Copper	Copper	Copper	Copper
11	Conductor Resistance @ 20C Ohms / 1000 ft. [Ohms / km]						
		41	41	41	25	16	6
		(135)	(134)	(134)	(83)	(53)	(20)
12	Conductor Quantity (For others, contact your sales representative)	10, 14, 16, 20, 24, 26, 34, 40, 50, 60	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 44, 50, 60, 64	09, 10, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	06, 08, 10, 12, 14, 15, 17, 20, 30	05 Through 40	04 Through 24
13	Impedance (Ohms) Unbalanced Balanced						
		103 171	89 —	104 —	136 —	119 —	127 —
14	Capacitance pF / ft [pF / m] Unbalanced Balanced						
		13.6 (44.62) 7.9 (25.91)	16.2 (53.1) —	13.1 (42.98) —	9.6 (31.5) —	11.0 (36.1) —	9.6 (31.5) —
15	Inductance μH / ft [μH / m] Unbalanced Balanced						
		.15 (0.49) .23 (0.75)	.13 (0.43) —	.14 (0.46) —	.18 (0.59) —	.15 (0.49) —	.15 (0.49) —
16	Signal Speed						
	Propagation Delay						
	ns / ft [ns / m] Unbalanced	1.40 (4.59)	1.44 (4.72)	1.36 (4.46)	1.30 (4.27)	1.30 (4.27)	1.22 (4.00)
	Balanced	1.35 (4.43)	—	—	—	—	—
	Velocity of Propagation %						
	Unbalanced Balanced	73 75	71 —	75 —	78 —	78 —	83 —
17	Insulation Resistance Ohms / 10 ft. [3 m]	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰
18	Voltage Rating						
	US	300	300	300	300	300	300
	Canada	300	300	—	150	150	150
	Europe	<50	<50	<50	<50	<50	<50
19	Temperature Rating US	-20C to +105C	-20C to +105C	-40C to +105C	-20C to +105C	-20C to +105C	-20C to +105C
	Canada	-20C to +105C	-20C to +105C	—	-20C to +80C	-20C to +80C	-20C to +80C
20	UL Listing - US	AWM	AWM	AWM	AWM	AWM	AWM
		Style 2651	Style 2651	Style 20297	Style 20462	Style 20462	Style 20462
21	UL Listing - Canada	Optional	Optional		Optional	Optional	Optional
		IA	IA	—	IA	IA	IA
		105C 300V FT1	105C 300V FT1		80C 150V FT1	80C 150V FT1	80C 150V FT1
22	Catalog Tech Sheets	TS-0066	TS-0063	TS-0342	TS-0259	TS-0084	TS-0057

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3M Cable

Cable Properties - Internal Wiring

Internal Wiring								
Extended Flex Life Cable			Color Coded Flat Cable			Twisted Pair Flat Cable		
	3539 Series	3319 Series	3302 Series	3811 Series	3391 Series	1700 Series	2100 Series	3782 Series
1	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—
4	PVC	PVC	PVC	PVC	PVC	PVC	PO	PVC
5	Gray	Black	Multi	Multi	Multi	Multi	Blue/White	Multi
6	Red	Red	Brown	Brown	Brown	Brown	Blue	Brown
7	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.156 (3.96)	.050 (1.27)	.050 (1.27)	.050 (1.27)
8	28 AWG	28 AWG	28 AWG	26 AWG	22 AWG	28 AWG	28 AWG	28 AWG
9	19 × 40 (19 × 0.079)	19 × 40 (19 × 0.079)	7 × 36 (7 × 0.127)	7 × 34 (7 × 0.160)	7 × 30 (7 × 0.254)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)
10	Copper	Copper Alloy	Copper	Copper	Copper	Copper	Copper	Copper
11								
	62	65	65	41	16	65	65	65
	(204)	(214)	(213)	(134)	(53)	(213)	(213)	(213)
12	09, 10, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	09, 10, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	09, 10, 14, 15, 16, 18, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	04, 06, 08, 10, 12, 15, 18, 22	10 (5 pair), 14 (7 pair), 16 (8 pair), 20 (10 pair), 26 (13 pair), 34 (17 pair), 36 (18 pair), 40 (20 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)	10 (5 pair), 14 (7 pair), 16 (8 pair), 20 (10 pair), 24 (12 pair), 26 (13 pair), 34 (17 pair), 40 (20 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)	10 (5 pair), 14 (7 pair), 16 (8 pair), 20 (10 pair), 26 (13 pair), 34 (17 pair), 40 (20 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)
13								
	106	107	105	95	153	101	102	115
	—	—	—	—	—	122	119	139
14								
	13.3 (43.8)	13.3 (43.6)	14.1 (46.3)	14.8 (48.6)	8.4 (27.5)	15.9 (52.2)	16.9 (55.4)	43.6 (13.3)
	—	—	—	—	—	13.3 (43.6)	14.6 (47.9)	36.1 (11.0)
15								
	.15 (0.49)	.15 (0.49)	.15 (0.49)	.13 (0.43)	.20 (0.65)	.16 (0.52)	.18 (0.59)	.59 (.18)
	—	—	—	—	—	.20 (0.66)	.21 (0.69)	.69 (.21)
16								
	1.42 (4.66)	1.42 (4.66)	1.47 (4.82)	1.41 (4.63)	1.29 (4.22)	1.61 (5.28)	1.74 (5.71)	5.0 (1.53)
	—	—	—	—	—	1.63 (5.35)	1.73 (5.68)	5.0 (1.53)
	72	72	69	72	79	63	58	66
	—	—	—	—	—	62	59	66
17	>1 × 10 [^] 10	>1 × 10 [^] 10	>1 × 10 [^] 9	>1 × 10 [^] 9	>1 × 10 [^] 9	>1 × 10 [^] 9	>1 × 10 [^] 10	>1 × 10 [^] 10
18								
	300	300	300	300	600	300	150	300
	300	300	150	150	150	150	—	—
	<50	<50	<50	<50	<50	<50	<50	<50
19	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +105C	-20C to +80C	-20C to +105C	-40C to +80C	-20C to +80C
	-20C to +105C	-20C to +105C	-20C to +80C	-20C to +80C	-20C to +80C	-20C to +80C	—	—
20	AWM	AWM	AWM	AWM	AWM	AWM	AWM	AWM
	Style 2651	Style 2651	Style 20462	Style 20462	Style 20122	Style 20462	Style 21008	Style 20488
21	Optional	Optional	Optional	Optional	Optional	Optional	—	—
	IA	IA	IA	IA	IA	IA		
	105C 300V FT1	105C 300V FT1	80C 150V FT1	80C 150V FT1	80C 150V FT1	80C 150V FT1		
22	TS-0058	TS-0059	TS-0123	TS-0122	TS-0079	TS-0115	TS-0762	TS-0999

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3M™ Cable

Cable Properties — External Wiring

		Internal Wiring			External Wiring		
		Ground Plane Cable			Round, Jacketed, Discrete, Twisted Pair Cable		
	Typical Cable Properties	3469 Series	3476 Series	3353 Series	3600X Series	3647B Series	3644 Series
1	Jacket Material	—	—	—	PVC	PVC	PVC
2	Jacket Color	—	—	—	Beige/Gray/Black	Beige	Beige
3	Shield	—	—	—	Film Foil & Braid	Film Foil & Braid	Film Foil & Braid
4	Primary Insulation Material	PVC	PVC	PVC	PVC	PO	PO
5	Primary Color	Gray	Gray	Gray	Multi	Multi	Multi
6	First Conductor Marking	Red	Red	Red	N/A	N/A	N/A
7	Conductor Spacing inch (mm)	.050 (1.27)	.050 (1.27)	.050 (1.27)	N/A	N/A	N/A
8	Conductor Size	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG
9	Conductor Stranding	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)
10	Conductor Material	Copper	Copper	Copper	Copper	Copper	Copper
11	Conductor Resistance Ohms / 1000 ft. (Ohms / km) @ 20C						
		65	65	65	65	65	65
		(213)	(213)	(213)	(213)	(213)	(213)
12	Conductor Quantity (For others, contact your sales representative)	10, 14, 15, 16, 20, 25, 26, 34, 37, 40, 50, 60, 64	10, 14, 15, 16, 20, 24, 25, 26, 34, 37, 40, 50, 60, 64	26, 34, 40, 50, 60, 64	14 (7 pair), 20 (10 pair), 26 (13 pair), 36 (18 pair), 40 (20 pair), 50 (25 pair), 68 (34 pair), 80 (40 pair), 100 (50 pair)	36 (18 pair)	14 (7 pair), 16 (8 pair), 20 (10 pair), 26 (13 pair), 36 (18 pair), 40 (20 pair), 50 (25 pair), 68 (34 pair), 80 (40 pair), 100 (50 pair)
13	Impedance (Ohms) Unbalanced Balanced						
		65	65	65	58	63	63
		—	—	—	91	100	100
14	Capacitance pF / ft. [pF / m] Unbalanced Balanced						
		25.1 (82.3)	25.1 (82.3)	25.1 (82.3)	29.2 (95.8)	24.2 (79.4)	24.2 (79.4)
		—	—	—	18.5 (60.7)	15.3 (50.2)	15.3 (0.49)
15	Inductance μH / ft. [μH / m] Unbalanced Balanced						
		.11 (0.36)	.11 (0.36)	.11 (0.36)	.10 (0.33)	.10 (0.33)	.10 (0.33)
		—	—	—	.15 (0.49)	.15 (0.49)	.15 (0.49)
16	Signal Speed						
	Propagation Delay						
	ns / ft [ns / m] Unbalanced	1.64 (5.38)	1.64 (5.38)	1.64 (5.38)	1.69 (5.54)	1.54 (5.05)	1.54 (5.05)
	Balanced	--	—	—	1.69 (5.54)	1.54 (5.05)	1.54 (5.05)
	Velocity of Propagation %						
	Unbalanced	62	62	62	60	66	66
17	Insulation Resistance Ohms / 10 ft. [3 m]						
		>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰
18	Voltage Rating				N.E.C.	N.E.C.	N.E.C.
	US	300	300	300	Article 725, CL2	Article 725, CL2	Article 725, CL2
	Canada	150	150	150	150	150	150
	Europe	<50	<50	<50	<50	<50	<50
19	Temperature Rating US	-20C to +105C	-20C to +105C	-20C to +105C	75C	75C	75C
	Canada	-20C to +105C	-20C to +105C	-20C to +105C	80C	80C	80C
20	UL Listing - US	AWM	AWM	AWM			
	Style 2682	Style 2682	Style 2682	Style 2682	CL2	CL2	CL2
21	UL Listing - Canada	Optional	Optional	Optional			
	IA	IA	IA	IA	IIA/B	IIA/B	IIA/B
	105C 150V FT1	105C 150V FT1	105C 150V FT1	105C 150V FT1	80C 150V FT1	80C 150V FT1	80C 150V FT1
22	Catalog Tech Sheets	TS-0077	TS-0071	TS-0078	TS-0388	TS-0582	TS-0826

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Cable Properties - External Wiring

	External Wiring						
	Round, Jacketed, Discrete, Twisted Pair Cable		Round, Jacket Mass-Terminated Cable		Flat Jacketed Cables		
	3560 Series	3750 Series	3759 Series	3659 Series	3603 Series	3517 Series	1785 Series
1	PVC	PVC	PVC	PVC	PVC	PVC	PVC
2	Gray	Gray	Black	Black	Black	Black	Black
3	Film Foil & Braid	Film Foil & Braid	N/A	Film Foil & Braid	N/A	Expanded Copper	Expanded Copper
4	PVC	PVC	PVC	PVC	PVC	PVC	PVC
5	Multi	Multi	Gray	Gray	Gray	Gray	Multi
6	N/A	N/A	Red	Red	Red	Red	Brown
7	N/A	N/A	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)	.050 (1.27)
8	26 AWG	26 AWG	28 AWG	28 AWG	28 AWG	28 AWG	28 AWG
9	Solid (0.404)	7 × 34 (7 × 0.160)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)
10	Copper	Copper	Copper	Copper	Copper	Copper	Copper
11							
	44 (143)	41 (134)	65 (213)	65 (213)	65 (213)	65 (213)	65 (213)
12	10 (5 pair), 16 (8 pair), 26 (13 pair), 32 (16 pair), 38 (19 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)	10 (5 pair), 16 (8 pair), 26 (13 pair), 38 (19 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)	9, 10, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	9, 10, 14, 15, 16, 20, 24, 25, 26, 34, 36, 37, 40, 50, 60, 64	10, 16, 20, 25, 26, 34, 36, 37, 40, 50, 60, 64	9, 10, 14, 15, 16, 20, 24, 25, 26, 30, 34, 36, 37, 40, 50, 60, 64	20 (10 pair), 26 (13 pair), 34 (17 pair), 36 (18 pair), 40 (20 pair), 50 (25 pair), 60 (30 pair), 64 (32 pair)
13							
	59	51	90	62	95	70	67
	97	100	133	106	160	119	118
14							
	29.3 (96.1) 17.8 (58.4)	35.6 (116.8) 18.1 (59.4)	16.7 (54.8) 11.9 (39.0)	27.7 (90.9) 15.2 (49.9)	15.5 (50.9) 9.4 (30.8)	21.5 (70.5) 12.7 (41.7)	24.7 (81.0) 13.8 (45.3)
15							
	.10 (0.33) .17 (0.56)	.09 (0.30) .18 (0.59)	.14 (0.46) .21 (0.69)	.13 (0.43) .20 (0.66)	.14 (0.46) .24 (0.79)	.11 (0.36) .19 (0.62)	.11 (0.36) .19 (0.62)
16							
	1.73 (5.68)	1.82 (5.97)	1.50 (4.92)	1.72 (5.64)	1.47 (4.82)	1.51 (4.95)	1.65 (5.41)
	1.73 (5.68)	1.81 (5.94)	1.58 (5.18)	1.62 (5.32)	1.50 (4.92)	1.51 (4.95)	1.63 (5.35)
	59	56	68	59	69	67	62
17							
	59	56	64	62	68	67	62
18							
	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ⁹
	N.E.C.	N.E.C.	N.E.C.	N.E.C.	N.E.C.	N.E.C.	N.E.C.
	Article 725, CL2	Article 725, CL2	Article 725, CL2	Article 725, CL2	Article 725, CL2	Article 725, CL2	Article 725, CL2
19							
	150	150	300	300	300	300	150
20							
	<50	<50	<50	<50	<50	<50	<50
21							
	75C	75C	75C	75C	75C	75C	75C
22							
	80C	80C	80C	80C	80C	80C	80C
23							
	CL2	CL2	CL2	CL2	CL2	CL2	CL2
24							
	IIA/B	IIA/B	IIA/B	IIA/B	IIA/B	IIA/B	IIA/B
25							
	80C 150V FT1	80C 150V FT1	80C 300V FT1	80C 300V FT1	80C 300V FT1	80C 300V FT1	80C 150V FT1
26							
	TS-0672	TS-0072	TS-0070	TS-0083	TS-0060	TS-0069	TS-308

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3M™ Cable

Cable Properties — Pleated Foil

Typical Cable Properties		Pleated Foil Cables							
		Flat Jacketed Cables							
		90101 Series	90201 Series	93101 Series	90111 Series	90211 Series	90202 Series	90104 Series	90204 Series
1	Jacket Material	PVC	TPE	PVC	PVC	TPE	TPE	PVC	TPE
2	Jacket Color	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
3	Shield	Pleated Foil	Pleated Foil	Pleated Foil	Pleated Foil	Pleated Foil	Pleated Foil	Pleated Foil	Pleated Foil
4	Primary Insulation Material	TPE	TPE	TPE	TPE	TPE	TPE	TPE	TPE
5	Primary Color	Translucent	Translucent	Translucent	Translucent	Translucent	Translucent	Translucent	Translucent
6	First Conductor Marking	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
7	Conductor Spacing inch (mm)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.050 (1.27)	.050 (1.27)
8	Conductor Size	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	28 AWG	28 AWG
9	Conductor Stranding	Solid (0.254)	Solid (0.254)	Solid (0.254)	Solid (0.254)	Solid (0.254)	7 × 38 (7 × 0.102)	7 × 36 (7 × 0.127)	7 × 36 (7 × 0.127)
10	Conductor Material	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper
11	Conductor Resistance Ohms / 1000 ft. (Ohms / km) @ 20C								
		112 (366)	112 (366)	112 (366)	112 (366)	112 (366)	101 (333)	65 (213)	65 (213)
12	Conductor Quantity (For others, contact your sales representative)	20, 26, 36, 40, 50, 68, 80, 100	20, 26, 36, 40, 50, 60, 68, 80, 100	50, 68, 80, 100	20, 26, 36, 40, 50, 68, 80, 100	20, 26, 36, 40, 50, 68, 80, 100	20, 26, 36, 40, 50, 60, 68, 80, 100	15, 20, 25, 26, 34, 37, 40, 50, 60, 64	15, 20, 25, 26, 34, 37, 40, 50, 60, 64
13	Impedance (Ohms) Unbalanced Balanced								
		53 104	53 104	53 104	72 129	72 129	46.1 88.5	53 110	53 110
14	Capacitance pF / ft. [pF / m] Unbalanced Balanced								
		28.4 (93.2) 14.5 (47.6)	28.4 (93.2) 14.5 (47.6)	28.4 (93.2) 14.5 (47.6)	21.0 (68.9) 11.6 (38.1)	21.0 (68.9) 11.6 (38.1)	35.5 (116.0) 18.3 (60.0)	28.1 (92.2) 13.4 (44.0)	28.1 (92.2) 13.4 (44.0)
15	Inductance µH / ft. [µH / m] Unbalanced Balanced								
		.08 (0.26) .16 (0.52)	.08 (0.26) .16 (0.52)	.08 (0.26) .16 (0.52)	.11 (0.36) .19 (0.62)	.11 (0.36) .19 (0.62)	.07 (0.23) .14 (0.46)	.08 (0.26) .16 (0.52)	.08 (0.26) .16 (0.52)
16	Signal Speed Propagation Delay ns / ft [ns / m] Unbalanced Balanced Velocity of Propagation % Unbalanced Balanced								
		1.52 (4.99)	1.52 (4.99)	1.52 (4.99)	1.51 (4.95)	1.51 (4.95)	1.63 (5.35)	1.49 (4.89)	1.49 (4.89)
		1.51 (4.95)	1.51 (4.95)	1.51 (4.95)	1.50 (4.92)	1.50 (4.92)	1.62 (5.32)	1.48 (4.86)	1.48 (4.86)
		67 67	67 67	67 67	67 68	67 68	62 62	68 69	68 69
17	Insulation Resistance Ohms / 10 ft. [3 m]	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰	>1 × 10 ¹⁰
18	Voltage Rating US Canada Europe	N.E.C.		N.E.C.	N.E.C.			N.E.C.	
		Article 725, CL2	150	Article 725, CL2	Article 725, CL2	150	150	Article 725, CL2	300
		150	150	150	150	150	150	150	150
		<50	<50	<50	<50	<50	<50	<50	<50
19	Temperature Rating US Canada	75C	-20C to +105C	75C	75C	-20C to +105C	-20C to +105C	75C	-20C to +105C
		80C	-20C to +105C	80C	80C	-20C to +105C	-20C to +105C	80C	-20C to +105C
20	UL Listing - US	CL2	Style 20674	CL2	CL2	Style 20674	Style 20297	CL2	Style 20674
21	UL Listing - Canada		Optional			Optional	Optional		Optional
		IIA/B	IA	IIA/B	IIA/B	IA	IA	IIA/B	IA
		80C 150V FT1	105C 150V FT1	80C 150V FT1	80C 150V FT1	105C 150V FT1	105C 150V FT1	80C 150V FT1	105C 150V FT1
22	Catalog Tech Sheets	TS-0285	TS-0402	TS-0876	TS-0451	TS-0598	TS-0730	TS-0288	TS-0403

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3M™ Cable

Cable Properties — Testing Method Summary

Cables can be used in various conductor configurations. Our testing is performed with what we consider the most typical configuration for the cable construction. See the respective product specification page for the tested configuration for each test value.

Impedance: (Z_0) is calculated — 1000 multiplied by the propagation delay, in nanoseconds per unit length (ns), divided by capacitance, in picofarads per unit length (pF) = Ohms (Ω). This calculation is verified by using a Time Domain Reflectometer (TDR), Tektronix 11801B Digital Sampling Oscilloscope with SD-24 TDR/Sampling head.

$$\text{IMPEDANCE (}\Omega\text{)} = \frac{\left[\text{PROPAGATION DELAY (ns/ft)} \right] \times 1000}{\text{CAPACITANCE (pF/ft)}}$$

Capacitance: (C) is measured — using a digital LCR meter, HP4275A Multi-frequency LCR meter, at 1 MHz, specified in picofarads per foot pF/ft.

Inductance: (L) is calculated — square characteristic impedance (Ω), multiplied by capacitance (pF/ft), divided by 1×10^6 = Inductance (L) in $\mu\text{H/ft}$.

$$\text{INDUCTANCE (}\mu\text{H)} = \frac{\text{IMPEDANCE (}\Omega\text{)}^2 \times \text{CAPACITANCE (pF)}}{1,000,000}$$

Propagation Delay: (Pd) is measured — using a network analyzer, HP8753A, short the far end of a 10 foot cable sample, locate the null at 1 wavelength, multiplied by the reciprocal of the frequency in megahertz (MHz) by 100 = Pd in ns/ft.

$$\text{PD (ns/ft)} = \frac{1}{\text{FREQUENCY (MHz)}} \times 100$$

Insulation Resistance: is measured — at 500 volts, between conductors and water, after one hour immersion.

Please contact your 3M Sales Representative if a more detailed description of these test methods is desired. TS-0731-08
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