3M™ Pleated Foil Cable Selection Guide

High Performance ″Pleated Foil Covered″ Transmission Line Cable

Innovative IDC cable offers a cost- effective option to coax and Teflon® cable for high speed applications.

A new level of performance

The 3M Pleated Foil Covered (PFC) cables offer solutions to long distance, high speed, multiple conductor data transfer. With many critical applications now demanding digital frequencies in the 100 Mhz range and lengths up to 10 meters, conventional twisted pair solutions introduce higher skew and attenuation that can result in unacceptable performance.

Low skew for accurate high-speed data transfer

The unique shielding construction of 3M™ Pleated Foil Cable 92101 Series reduces skew to under 100 ps/m, significantly less than other cables on the market. This makes the series 93101 cable ideal for applications that demand accuracy at high speeds, such as data transfer between servers and between servers and storage devices.

Pleated foil cables for 50 and 75 ohm unbalanced impedence applications

Pleated foil cables are available in 50 and 75 ohm unbalanced impedances. Both cables have low crosstalk and attenuation to support high signal density requirements. A thick cable jacket is available for outside-the-cabinet applications that require extra protection, and a thin cover is available for applications that require greater flexibility and routing.

3M™ Mini Delta Ribbon (MDR) connector with metal shells

3M™ MDR connectors are available for 20, 26, 36, 40, 50, 68, 80 and 100 conductor cables. While all the conductors can be used as signal lines, applications that require improved signal fidelity should use a ground-signal or balanced mode.

The MDR connector in combination with metal junction shells provides a durable combination for attachment to any I/O equipment. The 3M metal shell has squeeze-to-release latches in sizes 20 through 50 for easy attachment in hard-to-reach locations. For secure attachment, the metal shells for sizes 68, 80 and 100 have thumb screws. The complete 360 degree pleated copper of the cable plus the metal shell provide an extremely effective shield for noisy environments. These features result in a durable, user-friendly cable assembly that can be used in a number of high data rate cabling applications.

Performance advantage

The controlled impedance features of the PFC cable and the MDR connector allow digital data rates of up to 200 megabits per second per conductor with excellent signal fidelity. With ever-increasing clock speeds there is a continual upgrading of bandwidth requirements for all components in electronic equipment. Whether your application is in computers, telecommunications or consumer markets, PFC cables will perform in today's I/O applications as well as extended frequencies that may result from equipment upgrades or new designs.

Applications

Applications that can take full advantage of the superior performance and value of PFC cables include:

- Parallel super computers and mainframes
- Workstation servers and networks
- Digital video and graphics equipment
- Telecommunication switching

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Interconnect Solutions
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For technical, sales or ordering information call
800-225-5373

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Typical Cable Properties*	Pleated Foil Cables			Ground Plane Cables	Flat Shielded Jacketed	Round Shielded Jacketed
Cable Part Number	**90101 90201 93101 Series**	**90104 90204 Series**	**90111 90211 Series**	**3469 Series**	**3517 Series**	**3750 Series**
Impedance Ohms						
Unbalanced (GSG)	53	53	72	65	70	51
Balanced (SS)	104	110	129	—	119	100
Capacitance pF/ft. (pF/m)						
Unbalanced (GSG)	28.4 (93.2)	28.1 (92.2)	21.0 (68.9)	25.1 (82.3)	21.5 (70.5)	35.6 (116.8)
Balanced (SS)	14.5 (47.6)	13.4 (44.0)	11.6 (38.1)	—	12.7 (41.7)	18.1 (59.4)
Inductance μH/ft. (μH/m)						
Unbalanced (GSG)	.08 (0.26)	.08 (0.26)	.11 (0.36)	.11 (0.36)	.11 (0.36)	.09 (0.30)
Balanced (SS)	.16 (0.52)	.16 (0.52)	.19 (0.62)	—	.19 (0.62)	.18 (0.59)
Signal Speed						
Propagation Delay ns/ft. (ns/m)						
Unbalanced (GSG)	1.52 (4.99)	1.49 (4.89)	1.51 (4.95)	1.64 (5.38)	1.51 (4.95)	1.82 (5.97)
Balanced (SS)	1.51 (4.95)	1.48 (4.86)	1.50 (4.92)	—	1.51 (4.95)	1.81 (5.94)
Velocity of Propagation (%)						
Unbalanced (GSG)	67	68	67	62	67	56
Balanced (SS)	67	69	68	—	67	56
Attenuation						
dB/100 ft. @ 10MHz	4.9	3.8	4.9	10.0	6.5	5.0
dB/100 ft. @ 100 MHz	14.1	11.1	14.1	37.0	21.0	20.0
Rise time degradation (ns/10 ft.)	0.11	0.10	0.11	1.2	0.5	1.1
Unbalanced Crosstalk						
Pulse = 5 volt, 2.5 ns rise time						
GSG Configuration						
Forward	<1%	<1%	<1%	<10%	<2%	<10%
Back	<1%	<1%	<1%	<4%	<1%	<5%
SS Configuration						
Forward	<1%	<1%	<4%	<17%	<6%	<17%
Back	<3%	<2%	<14%	<7%	<6%	<8%
Pulse = 5 volt, 0.6 ns rise time						
GSG Configuration						
Forward	<1%	<1%	<2%	<14%	<3%	<18%
Back	<1%	<1%	<1%	<4%	<1%	<5%
SS Configuration						
Forward	<3%	<2%	<7%	<23%	<10%	<29%
(10 ft sample) Back	<3%	<2%	<14%	<7%	<6%	<8%
Balanced Crosstalk						
Pulse = 5 volt, 2.5 ns rise time						
SS Configuration						
Forward	<1%	<1%	<2%	<3%	<3%	<2%
(10 ft sample) Back	<2%	<1%	<4%	<3%	<2%	<2%
Catalog Pages	965, 967, 969	977, 979	971, 973	929	935	951

Conductor configuration: GSG = Ground-Signal-Ground, SS = Signal-Signal

*Note: Properties are typical results for cable only. Connectors, ground paths, circuit board traces, etc., will affect final circuit properties.

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