



CAT 7

RAIL NETWORKING CABLE

TE Connectivity (TE) introduces the new high performance, networking cables for railway Ethernet applications. This new cable reaches data rates up to 10Gbps, expanding design capabilities into broader bandwidth Ethernet applications. The enhanced design enables designers to balance performance requirements with installation time, lowering total costs and assuring system performance. Currently Cat5e is the predominant cable type used in the Rail industry but with ever increasing data rate demands this technology allows future proofing to be built in whenever cables are installed or replaced.

Description

- Obtain data rates of up to 10Gbps
- Expand design capabilities for broader bandwidth Ethernet connections with increased speed
- Stranded conductors for flexible cable application use
- Improve EMI shielding effectiveness, prevent external interference to signals and reduce noise
- High performance rail approved to EN45545-2

Applications

- Railway CCTV/Passenger Information
- Trackside control cabinets
- Industrial Switches, routers, servers, hubs
- Entertainment systems
- Sensor Systems
- Video link
- Sensor Systems

iS Rayfast

CAT 7 Rail Networking Cable Technical Characteristics.

Physical Characteristics		22 AWG	24 AWG	26 AWG
Structure	Construction	S/FTP	S/FTP	S/FTP
	Number of pairs	4 Pairs	4 Pairs	4 Pairs
Conductor	AWG	22 AWG	24 awg	26 AWG
	Conductor material	Stranded Tinned Copper	Stranded Tinned Copper	Stranded Tinned Copper
	Conductor dimension (mm)	0.73mm (19/0.15)	7/0.20 ± 0.02mm	0.48mm (7/0.16)
Insulation	Insulation material	Foamed PE	Foamed PE	Foamed PE
	Insulation dimension (mm)	1.57 ± 0.05 mm	1.32 ± 0.05mm	1.03 ± 0.05mm
	Nom. thickness (mm)	0.42mm	0.36mm	0.28mm
Cabling	Twisting lay length	≤ 30mm	≤ 30mm	≤ 30mm
	Cabling lay length	≤ 200mm	≤ 200mm	≤ 200mm
Shield	Individual shield and material	AL-Foil	AL-Foil	AL-Foil
	Primary overall shield & material	Stranded Tinned Copper	Tinned Copper Wire	Stranded Tinned Copper
	Shield nom. coverage	35% Nom.	35% Nom.	35% Nom.
Outer Jacket	Outer jacket material	LSFRZH	LSFRZH	LSFRZH
	Outer jacket thickness (mm)	1.0mm Nom.	1.0mm Nom.	1.0mm Nom.
	Overall nom dimension (mm)	9.70± 0.30mm	8.4 ± 0.30mm	7.00± 0.30mm
	Outer jacket colour	TE Blue	TE Blue	TE Blue
Mechanical Characteristics		22 AWG	24 AWG	26 AWG
Outer Jacket	Operating temp range	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
	Bulk cable weight	94kg/km	70kg/km	53kg/km
	Max. recommended pulling tension	80 N	80 N	80 N
	Min. bend radius (Install)	8 x O.D.	8 x O.D.	8 x O.D.
	Tensile strength	≥9 Mpa	≥9 Mpa	≥9 Mpa
	Elongation	≥100%	≥100%	≥100%
	Ageing condition	100°C x 168hrs	100°C x 168hrs	100°C x 168hrs
	After ageing tensile strength	≥70% of Unaging	≥70% of Unaging	≥70% of Unaging
	After ageing elongation	≥50% of Unaging	≥50% of Unaging	≥50% of Unaging
Cold bend	No cracks (-20°C/4hrs)	No cracks (-20°C x 4hrs)	No cracks (-20°C x 4hrs)	
Electrical Characteristics		22 AWG	24 AWG	26 AWG
Finished Cable	Nom. mutual capacitance	≤ 56 pF/m (@1kHz)	≤56 nF/100m (@1kHz)	≤56 nF/100m (@1kHz)
	Pair-ground capacitance unbalance	≤160 pF/100m	≤160 pF/100m	≤160 pF/100m
	Nominal velocity of propagation	65%	65%	65%
	Max. delay skew	25 ns/100m	25 ns/100m	25 ns/100m
	Max. conductor DC resistance	57.4 Ω/km (@ 20°C)	90.9 Ω/km (@ 20°C)	145 Ω/km (@ 20°C)
	Max. conductor resistance unbalance	2%	2%	2%
	Min. insulation resistance	5000 MΩ·km	5000 MΩ·km	5000 MΩ·km
	Max. operating voltage - UL	300 V	300V	300V

ELECTRICAL CHARACTERISTICS CONTINUED 22AWG								
Frequency	Characteristic	Characteristic	ATT	RL	NEXT	PS NEXT	FEXT	PD
	Impedance	Impedance						
	Upper limit	Lower limit						
(MHz)	Zu (Ω)	Zl (Ω)	(dB/100m)	(dB Min)	(dB Min)	(dB Min)	(dB Min)	(ns/100m Max)
4	115.2	86.8		23.0	78.0	75.0	70.0	552.0
8	112.6	88.8		24.5	78.0	75.0	70.0	546.7
10	111.9	89.4		25.0	78.0	75.0	70.0	545.4
16	111.9	89.4		25.0	78.0	75.0	70.0	543.0
20	111.9	89.4		25.0	78.0	75.0	70.0	542.0
25	113.2	88.3		24.2	78.0	75.0	70.0	541.2
31.25	114.6	87.2		23.3	78.0	75.0	70.0	540.4
62.5	120.2	83.2		20.7	75.5	72.5	70.0	538.6
100	125.3	79.8		19.0	72.4	69.4	70.0	537.6
200	135.7	73.7		16.4	67.9	64.9	70.0	536.5
250	140.0	71.4		15.6	66.4	63.4	70.0	536.3
300	139.8	71.5		15.6	65.2	62.2	70.0	536.1
600	139.8	71.5		15.6	60.7	57.7	70.0	535.5

ELECTRICAL CHARACTERISTICS CONTINUED 24AWG								
Frequency	Characteristic	Characteristic	ATT	RL	NEXT	PS NEXT	FEXT	PD
	Impedance	Impedance						
	Upper limit	Lower limit						
(MHz)	Zu (Ω)	Zl (Ω)	(dB/100m)	(dB Min)	(dB Min)	(dB Min)	(dB Min)	(ns/100m Max)
4	115.2	86.8	5.6	23.0	78.0	75.0	70.0	552.0
8	112.6	88.8	7.9	24.5	78.0	75.0	70.0	546.7
10	111.9	89.4	8.8	25.0	78.0	75.0	70.0	545.4
16	111.9	89.4	11.1	25.0	78.0	75.0	70.0	543.0
20	111.9	89.4	12.4	25.0	78.0	75.0	70.0	542.0
25	113.2	88.3	13.	24.2	78.0	75.0	70.0	541.2
31.25	114.6	87.2	15.6	23.3	78.0	75.0	70.0	540.4
62.5	120.2	83.2	22.3	20.7	75.5	72.5	70.0	538.6
100	125.3	79.8	28.5	19.0	72.4	69.4	70.0	537.6
200	135.7	73.7	41.2	16.4	67.9	64.9	70.0	536.5
250	140.0	71.4	46.5	15.6	66.4	63.4	70.0	536.3
300	139.8	71.5	51.3	15.6	65.2	62.2	70.0	536.1
600	139.8	71.5	75.1	15.6	60.7	57.7	70.0	535.5

ELECTRICAL CHARACTERISTICS CONTINUED 26AWG								
Frequency	Characteristic	Characteristic	ATT	RL	NEXT	PS NEXT	FEXT	PD
	Impedance	Impedance						
	Upper limit	Lower limit						
(MHz)	Zu (Ω)	Zl (Ω)	(dB/100m)	(dB Min)	(dB Min)	(dB Min)	(dB Min)	(ns/100m Max)
4	115.2	86.8		23.0	78.0	75.0	70.0	552.0
8	112.6	88.8		24.5	78.0	75.0	70.0	546.7
10	111.9	89.4		25.0	78.0	75.0	70.0	545.4
16	111.9	89.4		25.0	78.0	75.0	70.0	543.0
20	111.9	89.4		25.0	78.0	75.0	70.0	542.0
25	113.2	88.3		24.2	78.0	75.0	70.0	541.2
31.25	114.6	87.2		23.3	78.0	75.0	70.0	540.4
62.5	120.2	83.2		20.7	75.5	72.5	70.0	538.6
100	125.3	79.8		19.0	72.4	69.4	70.0	537.6
200	135.7	73.7		16.4	67.9	64.9	70.0	536.5
250	140.0	71.4		15.6	66.4	63.4	70.0	536.3
300	139.8	71.5		15.6	65.2	62.2	70.0	536.1
600	139.8	71.5		15.6	60.7	57.7	70.0	535.5

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