

Category 5e Communication Cable Requirements

as specified in ISO/IEC, IEC, CENELEC and TIA standards and draft specifications

per 8th February 2011

1. Applicable standards and draft specifications:

- 2nd edition ISO/IEC 11801
- Amendment 2 to 2nd edition ISO/IEC 11801
- ANSI/TIA-568-C.2
- 2nd edition IEC 61156-5
- 3rd edition IEC 61156-6
- 2nd edition CENELEC EN 50288-2-1
- 2nd edition CENELEC EN 50288-2-2
- 2nd edition CENELEC EN 50288-3-1
- 2nd edition CENELEC EN 50288-3-2
- 2nd edition CENELEC EN 50441-1, draft prEN 50441-1:2009
- 2nd edition CENELEC EN 50441-2, draft prEN 50441-2:2009
- 2nd edition CENELEC EN 50173-1
- Amendment 2 to 2nd edition EN 50173-1, draft FprAB July2010

2. Requirements for Unscreened Category 5e Horizontal Cables

Parameter	ISO/IEC	IEC	CENELEC	TIA/EIA	3P Requirements
Standards	* 2 nd edition ISO/IEC 11801 * Amendment 2 to 2 nd edition ISO/IEC 11801	2 nd edition IEC 61156-5	•2 nd edition EN 50288-3-1 •2 nd edition EN 50441-1, draft prEN 50441-1:2009 •2 nd edition EN 50173-1 •Amendment 2 to 2 nd edition EN 50173-1, draft FprAB July2010	ANSI/TIA 568-C.2	
Current carrying capacity	Not specified	Not specified	Not specified	Not specified	Not measured
dc resistance	Max. 95,0 Ω/km @ 20°C	Max. 95,0 Ω/km @ 20°C	Not specified	Max. 93,8 Ω/km @ 20°C	Max. 93,8 Ω/km @ 20°C
dc loop resistance	Not specified	Not specified	Max. 190 Ω/km	Not specified	Max. 190 Ω/km

Resistance unbalance within a pair	Max. 2 %	Max. 2 %	Max. 2,0 %	Max. 2,5 %	Max. 2,0 %
Resistance unbalance between pairs	Today outdated requirement is 4 %	Today outdated requirement is 4 %	Not specified	Not specified	Not measured
Mutual capacitance	Not specified	Not specified	Not specified	Max. 56 nF /km @ 1 kHz (for information)	Max. 56 nF /km @ 1 kHz (for information)
Capacitance unbalance	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km	Max. 3300 pF/km @ 1 kHz	Max. 1600 pF/km
Insulation resistance	Min. 5000 M Ω km	Min. 5000 M Ω km	Min. 5000 M Ω km	Not specified	Min. 5000 M Ω km
Dielectric strength	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Not specified	2,5 kVdc for 2 secs.
Input impedance	For information when return loss requirements are passed. Alternatively complex equation in the 2 nd edition IEC 61156-5 standard	For information when return loss requirements are passed. Alternatively complex equation in the standard	Not specified	Not specified	1-125 MHz: 100+/-15 Ω (for information)
Mean input impedance	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	Not specified	100+/-5 Ω @ 100 MHz
Return loss	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for long cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-125 MHz: 25-7log($\frac{f}{20}$) dB for long cable (100-125 MHz for information)

Attenuation (insertion loss) 20°C	4-100 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,0}{\sqrt{f}}$ dB/km	4-100 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,0}{\sqrt{f}}$ dB/km Optional for special use is 19,67 \sqrt{f} + 0,230 f+ $\frac{1,00}{\sqrt{f}}$ dB/km	4-100 MHz: 19,108 \sqrt{f} + 0,222 f+ $\frac{2,0}{\sqrt{f}}$ dB/km	1-100 MHz: 19,67 \sqrt{f} + 0,230 f+ $\frac{0,50}{\sqrt{f}}$ dB/km	1-2,6 MHz: 19,67 \sqrt{f} + 0,230 f+ $\frac{0,50}{\sqrt{f}}$ dB/km 2,6-125 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,0}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 40°C	4-100 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km	4-100 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km Optional for special use is 21,244 \sqrt{f} + 0,248 f+ $\frac{1,08}{\sqrt{f}}$ dB/km	4-100 MHz: 20,637 \sqrt{f} + 0,240 f+ $\frac{2,16}{\sqrt{f}}$ dB/km	1-100 MHz: 21,244 \sqrt{f} + 0,248 f+ $\frac{0,54}{\sqrt{f}}$ dB/km	1-2,6 MHz: 21,244 \sqrt{f} + 0,248 f+ $\frac{0,54}{\sqrt{f}}$ dB/km 1-125 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 60°C	4-100 MHz: 22,920 \sqrt{f} + 0,264 f+ $\frac{2,4}{\sqrt{f}}$ dB/km	4-100 MHz: 22,920 \sqrt{f} + 0,264 f+ $\frac{2,4}{\sqrt{f}}$ dB/km Optional for special use is 23,604 \sqrt{f} + 0,276 f+ $\frac{1,20}{\sqrt{f}}$ dB/km	4-100 MHz: 22,930 \sqrt{f} + 0,266 f+ $\frac{2,4}{\sqrt{f}}$ dB/km	1-100 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km	1-2,6 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km 2,6-125 MHz: 22,920 \sqrt{f} + 0,264 f+ $\frac{2,4}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Temperature correction factor for attenuation	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C
Near end crosstalk	4-100 MHz: 65,3-15log(f) dB	4-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-125 MHz: 65,3-15log(f) dB (100-125 MHz for information)
Power sum near end crosstalk	4-100 MHz: 62,3-15log(f) dB	4-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-125 MHz: 62,3-15log(f) dB (100-125 MHz for information)
ACR	Not specified	Not specified	Not specified	Not specified	1-125 MHz: NEXT- attenuation dB (100-125 MHz for information)

Power sum ACR	Not specified	Not specified	Not specified	Not specified	1-100 MHz: Power sum NEXT-attenuation dB
ELFEXT (ACR-F)	1-100 MHz: 63,8-20log(f) dB, and not specified when FEXT is over 70 dB	4-100 MHz: 64,0-20log(f) dB, and not specified when FEXT is over 90 dB	1-100 MHz: 63,8-20log(f) dB	1-100 MHz: 63,8-20log(f) dB	1-125 MHz: 64,0-20log(f) dB (100-125 MHz for information)
Power sum ELFEXT (PSACR-F)	1-100 MHz: 60,8-20log(f) dB, and not specified when power sum FEXT is over 67 dB	4-100 MHz: 61,0-20log(f) dB, and not specified when FEXT is over 90 dB	1-100 MHz: 60,8-20log(f) dB	1-100 MHz: 60,8-20log(f) dB	1-125 MHz: 61,0-20log(f) dB (100-125 MHz for information)
Power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Near end balance (TCL)	1-100 MHz: 50,0-10log(f)	Level 1: 1-100 MHz: 40,0-10log(f) Level 2: 1-100 MHz: 50,0-10log(f)	1-100 MHz: 40,0-10log(f)	Not specified	Level 2: 1-125 MHz: 50,0-10log(f) (100-125 MHz for information)
Far end balance (ELTCTL)	1-30 MHz: 35,0-20log(f)	1-30 MHz: 35,0-20log(f)	Not specified	Not specified	1-30 MHz: 35,0-20log(f)
Propagation delay	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-125 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km (100-125 MHz for information)

Velocity of propagation	Not specified	Not specified	Not specified	Not specified	Measured (for information)
Delay skew 20°C	4-100 MHz: Max. 450 ns/km	4-100 MHz: Max. 450 ns/km	Max. 400 ns/km @ 100 MHz	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 40°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 60°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew variation with temperature	Not specified	Not specified	Not specified	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C
Coupling attenuation	Not specified	Type III: 30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB Type II: 30- 1000 MHz: 55- $20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: 85- $20\log(\frac{f}{100})$ dB, max. 85 dB	30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB	Not specified	Type III: 30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB Type II: 30- 1000 MHz: 55- $20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: 85- $20\log(\frac{f}{100})$ dB, max. 85 dB
“EMC performance”	Not specified	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB	Min. 40 dB	Not specified	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB

3. Requirements for Unscreened Category 5e Flexible Cables

Parameter	ISO/IEC	IEC	CENELEC	TIA/EIA	3P Requirements
Standards	* 2 nd edition ISO/IEC 11801 * Amendment 2 to 2 nd edition ISO/IEC 11801	3 rd edition IEC 61156-6	•2 nd edition EN 50288-3-2 •2 nd edition EN 50173-1 •Amendment 2 to 2 nd edition EN 50173-1, draft FprAB July2010	ANSI/TIA 568-C.2	
Current carrying capacity	Not specified	Not specified	Not specified	Not specified	Not measured
dc resistance	Max. 145 Ω/km @ 20°C	Max. 145 Ω/km @ 20°C	Not specified	Max. 140 Ω/km @ 20°C	Max. 140 Ω/km @ 20°C
dc loop resistance	Not specified	Not specified	Max. 290 Ω/km	Not specified	Max. 290 Ω/km
Resistance unbalance within a pair	Max. 2 %	Max. 2 %	Max. 2,0 %	Max. 2,5 %	Max. 2,0 %
Resistance unbalance between pairs	Today outdated requirement is 4 %	Today outdated requirement is 4 %	Not specified	Not specified	Not measured
Mutual capacitance	Not specified	Not specified	Not specified	Max. 56 nF /km @ 1 kHz (for information)	Max. 56 nF /km @ 1 kHz (for information)
Capacitance unbalance	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km	Max. 3300 pF/km @ 1 kHz	Max. 1600 pF/km
Insulation resistance	Min. 5000 MΩ km	Min. 5000 MΩ km	Min. 500 MΩ km	Not specified	Min. 5000 MΩ km
Dielectric strength	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Not specified	2,5 kVdc for 2 secs.

Input impedance	For information when return loss requirements are passed. Alternatively complex equation in the 2 nd edition IEC 61156-6 standard	For information when return loss requirements are passed. Alternatively complex equation in the standard	Not specified	Not specified	1-125 MHz: 100+/-15 Ω (for information)
Mean input impedance	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	Not specified	100+/-5 Ω @ 100 MHz
Return loss	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for long cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-125 MHz: 25-7log($\frac{f}{20}$) dB for long cable (100-125 MHz for information)
Attenuation (insertion loss) 20°C	4-100 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	4-100 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	4-100 MHz: 28,662 \sqrt{f} + 0,333 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	1-100 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km Optional for speci- al use is 29,505 \sqrt{f} + 0,345 f+ $\frac{0,75}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: 29,505 \sqrt{f} + 0,345 f+ $\frac{0,75}{\sqrt{f}}$ dB/km 2,6-125 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km (100-125 MHz for information)

Attenuation (insertion loss) 40°C	4-100 MHz: $30,953\sqrt{f}+0,356 f+$ $\frac{3,24}{\sqrt{f}}$ dB/km	4-100 MHz: $30,953\sqrt{f}+0,356 f+$ $\frac{3,24}{\sqrt{f}}$ dB/km	4-100 MHz: $30,955\sqrt{f}+0,360 f+$ $\frac{3,24}{\sqrt{f}}$ dB/km	1-100 MHz: $25,493\sqrt{f}+0,298 f+$ $\frac{0,65}{\sqrt{f}}$ dB/km Optional for special use is $31,866\sqrt{f}+0,372 f+$ $\frac{0,81}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: $25,493\sqrt{f}+0,298 f+$ $\frac{0,65}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: $31,866\sqrt{f}+0,372 f+$ $\frac{0,81}{\sqrt{f}}$ dB/km 2,6-125 MHz: $30,953\sqrt{f}+0,356 f+$ $\frac{3,24}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 60°C	4-100 MHz: $34,392\sqrt{f}+0,396 f+$ $\frac{3,60}{\sqrt{f}}$ dB/km	4-100 MHz: $34,392\sqrt{f}+0,396 f+$ $\frac{3,60}{\sqrt{f}}$ dB/km	4-100 MHz: $33,990\sqrt{f}+0,400 f+$ $\frac{3,60}{\sqrt{f}}$ dB/km	1-100 MHz: $28,325\sqrt{f}+0,331 f+$ $\frac{0,72}{\sqrt{f}}$ dB/km Optional for special use is $35,406\sqrt{f}+0,414 f+$ $\frac{0,90}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: $28,325\sqrt{f}+0,331 f+$ $\frac{0,72}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: $35,406\sqrt{f}+0,414 f+$ $\frac{0,90}{\sqrt{f}}$ dB/km 2,6-125 MHz: $34,392\sqrt{f}+0,396 f+$ $\frac{3,60}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Temperature correction factor for attenuation	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C	20-40°C: 0,4 %/°C 40-60°C: 0,6 %/°C
Near end crosstalk	4-100 MHz: 65,3-15log(f) dB	4-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-125 MHz: 65,3-15log(f) dB (100-125 MHz for information)
Power sum near end crosstalk	4-100 MHz: 62,3-15log(f) dB	4-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-125 MHz: 62,3-15log(f) dB (100-125 MHz for information)

ACR	Not specified	Not specified	Not specified	Not specified	<i>1-125 MHz:</i> NEXT- attenuation dB (100-125 MHz for information)
Power sum ACR	Not specified	Not specified	Not specified	Not specified	<i>1-100 MHz:</i> Power sum NEXT- attenuation dB
ELFEXT (ACR-F)	<i>1-100 MHz:</i> 63,8-20log(f) dB, and not specified when FEXT is over 70 dB	<i>4-100 MHz:</i> 64,0-20log(f) dB, and not specified when FEXT is over 70 dB	<i>1-100 MHz:</i> 63,8-20log(f) dB	<i>1-100 MHz:</i> 63,8-20log(f) dB	<i>1-125 MHz:</i> 64,0-20log(f) dB (100-125 MHz for information)
Power sum ELFEXT (PSACR-F)	<i>1-100 MHz:</i> 60,8-20log(f) dB, and not specified when power sum FEXT is over 67 dB	<i>4-100 MHz:</i> 61,0-20log(f) dB, and not specified when FEXT is over 70 dB	<i>1-100 MHz:</i> 60,8-20log(f) dB	<i>1-100 MHz:</i> 60,8-20log(f) dB	<i>1-125 MHz:</i> 61,0-20log(f) dB (100-125 MHz for information)
Near end balance (TCL)	<i>1-100 MHz:</i> 50,0-10log(f)	Level 1: <i>1-100 MHz:</i> 40,0-10log(f) Level 2: <i>1-100 MHz:</i> 50,0-10log(f)	<i>1-100 MHz:</i> 40,0-10log(f)	Not specified	Level 2: <i>1-125 MHz:</i> 50,0-10log(f) (100-125 MHz for information)
Far end balance (ELTCTL)	<i>1-30 MHz:</i> 35,0-20log(f)	<i>1-30 MHz:</i> 35,0-20log(f)	Not specified	Not specified	<i>1-30 MHz:</i> 35,0-20log(f)
Power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured

Propagation delay	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-125 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km (100-125 MHz for information)
Velocity of propagation	Not specified	Not specified	Not specified	Not specified	Measured (for information)
Delay skew 20°C	4-100 MHz: Max. 450 ns/km	4-100 MHz: Max. 450 ns/km	Max. 400 ns/km @ 100 MHz	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 40°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 60°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew variation with temperature	Not specified	Not specified	Not specified	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C
Coupling attenuation	Not specified	Type III: 30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB Type II: 30- 1000 MHz: 55- $20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: 85- $20\log(\frac{f}{100})$ dB, max. 85 dB	30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB	Not specified	Type III: 30- 1000 MHz: 40- $20\log(\frac{f}{100})$ dB, max. 40 dB Type II: 30- 1000 MHz: 55- $20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: 85- $20\log(\frac{f}{100})$ dB, max. 85 dB
“EMC performance”	Not specified	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB	Min. 40 dB	Not specified	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB

4. Requirements for Screened Category 5e Horizontal Cables

Parameter	ISO/IEC	IEC	CENELEC	TIA/EIA	3P Requirements
Standards	* 2 nd edition ISO/IEC 11801 * Amendment 2 to 2 nd edition ISO/IEC 11801	2 nd edition IEC 61156-5	•2 nd edition EN 50288-2-1 •2 nd edition EN 50441-2, draft prEN 50441-2 :2009 •2 nd edition EN 50173-1 •Amendment 2 to 2 nd edition EN 50173-1, draft FprAB July2010	ANSI/TIA 568-C.2	
Current carrying capacity	Not specified	Not specified	Not specified	Not specified	Not measured
dc resistance	Max. 95,0 Ω/km @ 20°C	Max. 95,0 Ω/km @ 20°C	Not specified	Max. 93,8 Ω/km @ 20°C	Max. 93,8 Ω/km @ 20°C
dc loop resistance	Not specified	Not specified	Max. 190 Ω/km	Not specified	Max. 190 Ω/km
Resistance unbalance within a pair	Max. 2 %	Max. 2 %	Max. 2,0 %	Max. 2,5 %	Max. 2,0 %
Resistance unbalance between pairs	Today outdated requirement is 4 %	Today outdated requirement is 4 %	Not specified	Not specified	Not measured
Mutual capacitance	Not specified	Not specified	Not specified	Max. 56 nF /km @ 1 kHz (for information)	Max. 56 nF /km @ 1 kHz (for information)
Capacitance unbalance	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km	Max. 3300 pF/km @ 1 kHz	Max. 1600 pF/km
Insulation resistance	Min. 5000 MΩ km	Min. 5000 MΩ km	Min. 5000 MΩ km	Not specified	Min. 5000 MΩ km
Dielectric strength	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Not specified	2,5 kVdc for 2 secs.

Input impedance	For information when return loss requirements are passed. Alternatively complex equation in the 2 nd edition IEC 61156-5 standard	For information when return loss requirements are passed. Alternatively complex equation in the standard	Not specified	Not specified	1-125 MHz: 100+/-15 Ω (for information)
Mean input impedance	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	Not specified	100+/-5 Ω @ 100 MHz
Return loss	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for long cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for 100 m cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-125 MHz: 25-7log($\frac{f}{20}$) dB for long cable (100-125 MHz for information)
Attenuation (insertion loss) 20°C	4-100 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,00}{\sqrt{f}}$ dB/km	4-100 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,00}{\sqrt{f}}$ dB/km Optional for special use is 19,67 \sqrt{f} + 0,230 f+ $\frac{1,00}{\sqrt{f}}$ dB/km	4-100 MHz: 19,108 \sqrt{f} + 0,222 f+ $\frac{2,0}{\sqrt{f}}$ dB/km	1-100 MHz: 19,67 \sqrt{f} + 0,230 f+ $\frac{0,50}{\sqrt{f}}$ dB/km	1-2,6 MHz: 19,67 \sqrt{f} + 0,230 f+ $\frac{0,50}{\sqrt{f}}$ dB/km 2,6-125 MHz: 19,10 \sqrt{f} + 0,22 f+ $\frac{2,0}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 40°C	4-100 MHz: 19,864 \sqrt{f} + 0,229 f+ $\frac{2,08}{\sqrt{f}}$ dB/km	4-100 MHz: 19,864 \sqrt{f} + 0,229 f+ $\frac{2,08}{\sqrt{f}}$ dB/km Optional for special use is 20,457 \sqrt{f} + 0,239 f+ $\frac{1,04}{\sqrt{f}}$ dB/km	4-100 MHz: 19,872 \sqrt{f} + 0,231 f+ $\frac{2,08}{\sqrt{f}}$ dB/km	1-100 MHz: 20,457 \sqrt{f} + 0,239 f+ $\frac{0,52}{\sqrt{f}}$ dB/km	1-2,6 MHz: 20,457 \sqrt{f} + 0,239 f+ $\frac{0,52}{\sqrt{f}}$ dB/km 1-125 MHz: 19,864 \sqrt{f} + 0,229 f+ $\frac{2,08}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 60°C	4-100 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km	4-100 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km Optional for special use is 21,244 \sqrt{f} + 0,248 f+ $\frac{1,08}{\sqrt{f}}$ dB/km	4-100 MHz: 20,637 \sqrt{f} + 0,240 f+ $\frac{2,16}{\sqrt{f}}$ dB/km	1-100 MHz: 21,244 \sqrt{f} + 0,248 f+ $\frac{0,54}{\sqrt{f}}$ dB/km	1-2,6 MHz: 21,244 \sqrt{f} + 0,248 f+ $\frac{0,54}{\sqrt{f}}$ dB/km 2,6-125 MHz: 20,628 \sqrt{f} + 0,238 f+ $\frac{2,16}{\sqrt{f}}$ dB/km (100-125 MHz for information)

Temperature correction factor for attenuation	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C
Near end crosstalk	4-100 MHz: 65,3-15log(f) dB	4-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-125 MHz: 65,3-15log(f) dB (100-125 MHz for information)
Power sum near end crosstalk	4-100 MHz: 62,3-15log(f) dB	4-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-125 MHz: 62,3-15log(f) dB (100-125 MHz for information)
ACR	Not specified	Not specified	Not specified	Not specified	1-125 MHz: NEXT-attenuation dB (100-125 MHz for information)
Power sum ACR	Not specified	Not specified	Not specified	Not specified	1-100 MHz: Power sum NEXT-attenuation dB
ELFEXT (ACR-F)	1-100 MHz: 63,8-20log(f) dB, and not specified when FEXT is over 70 dB	4-100 MHz: 64,0-20log(f) dB, and not specified when FEXT is over 90 dB	1-100 MHz: 63,8-20log(f) dB	1-100 MHz: 63,8-20log(f) dB	1-125 MHz: 64,0-20log(f) dB (100-125 MHz for information)
Power sum ELFEXT (PSACR-F)	1-100 MHz: 60,8-20log(f) dB, and not specified when power sum FEXT is over 67 dB	4-100 MHz: 61,0-20log(f) dB, and not specified when FEXT is over 90 dB	1-100 MHz: 60,8-20log(f) dB	1-100 MHz: 60,8-20log(f) dB	1-125 MHz: 61,0-20log(f) dB (100-125 MHz for information)
Power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured

Average power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Near end balance (TCL)	Level 1: 1-250 MHz: 40,0-10log(f) Level 2: 1-250 MHz: 50,0-10log(f)	Level 1: 1-250 MHz: 40,0-10log(f) Level 2: 1-250 MHz: 50,0-10log(f)	1-100 MHz: 40,0-10log(f)	Not specified	Level 2: 1-125 MHz: 50,0-10log(f) (100-125 MHz for information)
Far end balance (ELTCTL)	1-30 MHz: 35,0-20log(f)	1-30 MHz: 35,0-20log(f)	Not specified	Not specified	1-30 MHz: 35,0-20log(f)
Propagation delay	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-125 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km (100-125 MHz for information)
Velocity of propagation	Not specified	Not specified	Not specified	Not specified	Measured (for information)
Delay skew 20°C	4-100 MHz: Max. 450 ns/km	4-100 MHz: Max. 450 ns/km	Max. 400 ns/km @ 100 MHz	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 40°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 60°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew variation with temperature	Not specified	Not specified	Not specified	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C

Coupling attenuation	30- 1000 MHz: 55-20log($\frac{f}{100}$) dB, max. 55 dB	Type III: 30- 1000 MHz: 40- 20log($\frac{f}{100}$) dB, max. 40 dB Type II: 30- 1000 MHz: 55- 20log($\frac{f}{100}$) dB, max. 55 dB Type I: 30- 1000 MHz: 85- 20log($\frac{f}{100}$) dB, max. 85 dB	30- 1000 MHz: 55- 20log($\frac{f}{100}$) dB, max. 55 dB	30-100 MHz: 55 dB	Type II: 30- 1000 MHz: 55- 20log($\frac{f}{100}$) dB, max. 55 dB Type I: 30- 1000 MHz: 85- 20log($\frac{f}{100}$) dB, max. 85 dB
“EMC performance”	Type II: Min. 55 dB	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB	Min. 55 dB	Min. 55 dB	Type II: Min. 55 dB Type I: Min. 85 dB
Transfer impedance	Max. 50 mΩ/m @1 MHz Max. 100 mΩ/m @10 MHz Max. 200 mΩ/m @30 MHz Max. 1000 mΩ/m @100 MHz	Grade 1: Max. 10 mΩ/m @1 MHz Max. 10 mΩ/m @10 MHz Max. 30 mΩ/m @30 MHz Max. 100 mΩ/m @100 MHz Grade 2: Max. 50 mΩ/m @1 MHz Max. 100 mΩ/m @10 MHz Max. 200 mΩ/m @30 MHz Max. 1000 mΩ/m @100 MHz	Max. 50 mΩ/m @1 MHz Max. 100 mΩ/m @10 MHz Max. 200 mΩ/m @30 MHz	1-100 MHz: 10 f mΩ/m, min. 50 mΩ/m	Grade 1: Max. 10 mΩ/m @1 MHz Max. 10 mΩ/m @10 MHz Max. 30 mΩ/m @30 MHz Max. 100 mΩ/m @100 MHz Grade 2: Max. 50 mΩ/m @1 MHz Max. 100 mΩ/m @10 MHz Max. 200 mΩ/m @30 MHz Max. 1000 mΩ/m @100 MHz
Screening attenuation	Not specified	Not specified	Today outdated requirement is 30- 100 MHz: Min. 40 dB	Not specified	Not measured

5. Requirements for Screened Category 5e Flexible Cables

Parameter	ISO/IEC	IEC	CENELEC	TIA/EIA	3P Requirements
Standards	* 2 nd edition ISO/IEC 11801 * Amendment 2 to 2 nd edition ISO/IEC 11801	3 rd edition IEC 61156-6	•2 nd edition EN 50288-2-2 •2 nd edition EN 50173-1 •Amendment 2 to 2 nd edition EN 50173-1, draft FprAB July2010	ANSI/TIA 568-C.2	
Current carrying capacity	Not specified	Not specified	Not specified	Not specified	Not measured
dc resistance	Max. 145 Ω/km @ 20°C	Max. 145 Ω/km @ 20°C	Not specified	Max. 140 Ω/km @ 20°C	Max. 140 Ω/km @ 20°C
dc loop resistance	Not specified	Not specified	Max. 290 Ω/km	Not specified	Max. 290 Ω/km
Resistance unbalance within a pair	Max. 2 %	Max. 2 %	Max. 2,0 %	Max. 2,5 %	Max. 2,0 %
Resistance unbalance between pairs	Today outdated requirement is 4 %	Today outdated requirement is 4 %	Not specified	Not specified	Not measured
Mutual capacitance	Not specified	Not specified	Not specified	Max. 56 nF /km @ 1 kHz (for information)	Max. 56 nF /km @ 1 kHz (for information)
Capacitance unbalance	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km @ 0,8 or 1 kHz	Max. 1600 pF/km	Max. 3300 pF/km @ 1 kHz	Max. 1600 pF/km
Insulation resistance	Min. 5000 MΩ km	Min. 5000 MΩ km	Min. 500 MΩ km	Not specified	Min. 5000 MΩ km
Dielectric strength	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVdc for 1 min. or 2,5 kVdc or 1,7 kVdc for 2 secs.	Min. 1,0 kVdc or 0,7 kVac for 1 min. or 2,5 kVdc or 1,7 kVac for 2 secs.	Not specified	2,5 kVdc for 2 secs.

Input impedance	For information when return loss requirements are passed. Alternatively complex equation in the 2 nd edition IEC 61156-6 standard	For information when return loss requirements are passed. Alternatively complex equation in the standard	Not specified	Not specified	1-125 MHz: 100+/-15 Ω (for information)
Mean input impedance	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	100+/-5 Ω @ 100 MHz	Not specified	100+/-5 Ω @ 100 MHz
Return loss	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	4-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-7log($\frac{f}{20}$) dB for long cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-100 MHz: 25-8,6log($\frac{f}{20}$) dB for 100 m cable	1-20 MHz: 20+5log(f) dB, max. 25,0 dB 20-125 MHz: 25-7log($\frac{f}{20}$) dB for long cable (100-125 MHz for information)
Attenuation (insertion loss) 20°C	4-100 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	4-100 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	4-100 MHz: 28,662 \sqrt{f} + 0,333 f+ $\frac{3,0}{\sqrt{f}}$ dB/km	1-100 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km Optional for special use is 29,505 \sqrt{f} + 0,345 f+ $\frac{0,75}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: 23,604 \sqrt{f} + 0,276 f+ $\frac{0,60}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: 29,505 \sqrt{f} + 0,345 f+ $\frac{0,75}{\sqrt{f}}$ dB/km 2,6-125 MHz: 28,66 \sqrt{f} + 0,33 f+ $\frac{3,0}{\sqrt{f}}$ dB/km (100-125 MHz for information)

Attenuation (insertion loss) 40°C	4-100 MHz: 29,806 \sqrt{f} + 0,343 f+ $\frac{3,12}{\sqrt{f}}$ dB/km	4-100 MHz: 29,806 \sqrt{f} + 0,343 f+ $\frac{3,12}{\sqrt{f}}$ dB/km	4-100 MHz: 29,808 \sqrt{f} + 0,346 f+ $\frac{3,12}{\sqrt{f}}$ dB/km	1-100 MHz: 24,548 \sqrt{f} + 0,287 f+ $\frac{0,62}{\sqrt{f}}$ dB/km Optional for speci- al use is 30,686 \sqrt{f} + 0,359 f+ $\frac{0,78}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: 24,548 \sqrt{f} + 0,287 f+ $\frac{0,62}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: 30,686 \sqrt{f} + 0,359 f+ $\frac{0,78}{\sqrt{f}}$ dB/km 2,6-125 MHz: 29,806 \sqrt{f} + 0,343 f+ $\frac{3,12}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Attenuation (insertion loss) 60°C	4-100 MHz: 30,953 \sqrt{f} + 0,356 f+ $\frac{3,24}{\sqrt{f}}$ dB/km	4-100 MHz: 30,953 \sqrt{f} + 0,356 f+ $\frac{3,24}{\sqrt{f}}$ dB/km	4-100 MHz: 30,955 \sqrt{f} + 0,360 f+ $\frac{3,24}{\sqrt{f}}$ dB/km	1-100 MHz: 25,493 \sqrt{f} + 0,298 f+ $\frac{0,65}{\sqrt{f}}$ dB/km Optional for speci- al use is 31,866 \sqrt{f} + 0,372 f+ $\frac{0,81}{\sqrt{f}}$ dB/km	24 AWG: 1-125 MHz: 25,493 \sqrt{f} + 0,298 f+ $\frac{0,65}{\sqrt{f}}$ dB/km (100-125 MHz for information) 26AWG: 1-2,6 MHz: 31,866 \sqrt{f} + 0,372 f+ $\frac{0,81}{\sqrt{f}}$ dB/km 2,6-125 MHz: 30,953 \sqrt{f} + 0,356 f+ $\frac{3,24}{\sqrt{f}}$ dB/km (100-125 MHz for information)
Temperature correction factor for attenuation	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C	20-60°C: 0,2 %/°C
Near end crosstalk	4-100 MHz: 65,3-15log(f) dB	4-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-100 MHz: 65,3-15log(f) dB	1-125 MHz: 65,3-15log(f) dB (100-125 MHz for information)
Power sum near end crosstalk	4-100 MHz: 62,3-15log(f) dB	4-100 MHz: 62,3-15log(f) dB	4-100 MHz: 62,3-15log(f) dB	1-100 MHz: 62,3-15log(f) dB	1-125 MHz: 62,3-15log(f) dB (100-125 MHz for information)

ACR	Not specified	Not specified	Not specified	Not specified	<i>1-125 MHz:</i> NEXT- attenuation dB (100-125 MHz for information)
Power sum ACR	Not specified	Not specified	Not specified	Not specified	<i>1-100 MHz:</i> Power sum NEXT- attenuation dB
ELFEXT (ACR-F)	<i>1-100 MHz:</i> 63,8-20log(f) dB, and not specified when FEXT is over 70 dB	<i>4-100 MHz:</i> 64,0-20log(f) dB, and not specified when FEXT is over 90 dB	<i>4-100 MHz:</i> 63,8-20log(f) dB	<i>1-100 MHz:</i> 63,8-20log(f) dB	<i>1-125 MHz:</i> 64,0-20log(f) dB (100-125 MHz for information)
Power sum ELFEXT (PSACR-F)	<i>1-100 MHz:</i> 60,8-20log(f) dB, and not specified when power sum FEXT is over 67 dB	<i>4-100 MHz:</i> 61,0-20log(f) dB, and not specified when FEXT is over 90 dB	<i>4-100 MHz:</i> 60,8-20log(f) dB	<i>1-100 MHz:</i> 60,8-20log(f) dB	<i>1-125 MHz:</i> 61,0-20log(f) dB (100-125 MHz for information)
Near end balance (TCL)	Level 1: <i>1-250 MHz:</i> 40,0-10log(f) Level 2: <i>1-250 MHz:</i> 50,0-10log(f)	Level 1: <i>1-250 MHz:</i> 40,0-10log(f) Level 2: <i>1-250 MHz:</i> 50,0-10log(f)	<i>1-100 MHz:</i> 40,0-10log(f)	Not specified	Level 2: <i>1-125 MHz:</i> 50,0-10log(f) (100-125 MHz for information)
Far end balance (ELTCTL)	<i>1-30 MHz:</i> 35,0-20log(f)	<i>1-30 MHz:</i> 35,0-20log(f)	Not specified	Not specified	<i>1-30 MHz:</i> 35,0-20log(f)
Power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien near end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured
Average power sum alien equal level far end crosstalk	Not specified	Not specified	Not specified	Not specified	Not measured

Propagation delay	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	4-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-100 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km	1-125 MHz: 5340+ $\frac{360}{\sqrt{f}}$ ns/km
Velocity of propagation	Not specified	Not specified	Not specified	Not specified	Measured (for information)
Delay skew 20°C	4-100 MHz: Max. 450 ns/km	4-100 MHz: Max. 450 ns/km	Max. 400 ns/km @ 100 MHz	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 40°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew 60°C	Not specified	Not specified	Not specified	1-100 MHz: Max. 450 ns/km	1-125 MHz: Max. 400 ns/km (100-125 MHz for information)
Delay skew variation with temperature	Not specified	Not specified	Not specified	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C	1-100 MHz: Max. +/- 100 ns/km of value at 20°C when measured at 40°C and 60°C
Coupling attenuation	30- 1000 MHz: $55-20\log(\frac{f}{100})$ dB, max. 55 dB	Type III: 30- 1000 MHz: $40-20\log(\frac{f}{100})$ dB, max. 40 dB Type II: 30- 1000 MHz: $55-20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: $85-20\log(\frac{f}{100})$ dB, max. 85 dB	30- 1000 MHz: $55-20\log(\frac{f}{100})$ dB, max. 40 dB	30-100 MHz: 55	Type II: 30- 1000 MHz: $55-20\log(\frac{f}{100})$ dB, max. 55 dB Type I: 30- 1000 MHz: $85-20\log(\frac{f}{100})$ dB, max. 85 dB
“EMC performance”	Type II: Min. 55 dB	Type III: Min. 40 dB Type II: Min. 55 dB Type I: Min. 85 dB	Min. 55 dB	Min. 55 dB	Type II: Min. 55 dB Type I: Min. 85 dB

Transfer impedance	Max. 50 mΩ/m @ 1 MHz Max. 100 mΩ/m @ 10 MHz Max. 200 mΩ/m @ 30 MHz Max. 1000 mΩ/m @ 100 MHz	Grade 1: Max. 10 mΩ/m @ 1 MHz Max. 10 mΩ/m @ 10 MHz Max. 30 mΩ/m @ 30 MHz Max. 100 mΩ/m @ 100 MHz Grade 2: Max. 50 mΩ/m @ 1 MHz Max. 100 mΩ/m @ 10 MHz Max. 200 mΩ/m @ 30 MHz Max. 1000 mΩ/m @ 100 MHz	Max. 50 mΩ/m @ 1 MHz Max. 100 mΩ/m @ 10 MHz Max. 200 mΩ/m @ 30 MHz	1-100 MHz: 10 f mΩ/m, min. 50 mΩ/m	Grade 1: Max. 10 mΩ/m @ 1 MHz Max. 10 mΩ/m @ 10 MHz Max. 30 mΩ/m @ 30 MHz Max. 100 mΩ/m @ 100 MHz Grade 2: Max. 50 mΩ/m @ 1 MHz Max. 100 mΩ/m @ 10 MHz Max. 200 mΩ/m @ 30 MHz Max. 1000 mΩ/m @ 100 MHz
Screening attenuation	Not specified	Not specified	Today outdated requirement is 30- 100 MHz: Min. 40 dB	Not specified	Not measured