

tBL[®] - TP sample case



tBL[®] - tde Basic Link (TP)

tBL[®] tde Basic Link (TP) is a complete system solution for structured cabling in Cat6A for transfer rates of up to 10GbE in real time. The tBL[®] - cabling link corresponds to a permanent link in accordance with ISO / IEC 11801 (EN 50173). The RJ45 modules are available in the form factors Keystone (KS) and Data Center (DC). The compact design of the 6fold RJ45 DC module allows a high packing density of up to 48 RJ45 ports on 1U. The RJ45 module is connected to the tBL[®] - cable termination block by simply plugging. The slim cable termination block can be easily assembled on the cable by using the tBL[®] - crimp tool and is suitable for preterminated cables. The modular design of individual RJ45 modules are interchangeable at any time without termination. A cost effective alternative product is the RJ45 keystone module without cable termination block in the tool-less design.

The system solution is complemented by an extensive portfolio of carrier systems. These include design-capable data outlets, floor box frames, Consolidation points, DIN rail modules and patch panels in 1/2 and 1U.



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h2>tBL® - TP sample case

Technical Data

Type	tBL® - Sample case
Material	Polypropylen
Colour case	black
Colour closures	red
Dimensions	391x304x104mm
Includes	1 x tBL® - RJ45 DC 6fold Module Cat.6_A ISO/IEC
	15 x tBL® - termination block AWG 26-27, transparent white for stranded cables
	6 x tBL® - termination block AWG 22-24,transparent yellow for installation cables
	1 x tBL® - RJ45 Keystonemodul Cat.6 _A ISO/IEC tool-less, AWG 22-24
	1 x tBL® - RJ45 Keystone Module Cat.6_A ISO/IEC w/o termination block
	1 x tBL® - RJ45 Keystone Module Cat.6_A ISO/IEC, termination block AWG 22-24, angled
	1 x tBL® - Extender Cat.6 _A ISO/IEC incl. 2x Termination Block AWG 22-24
	1 x tBL® - DIN Rail Housing for 1x RJ45 Keystone Module
	1 x tBL® - wall outlet (open design) 45° for 2x Keystone Modules incl. central plate 50x50mm, RAL9010
	1 x tBL® - wall outlet 45° for 3x Keystone Modules incl. frame 80x80mm, RAL9010
	1 x tBL® - Pulling Aid for cable termination block
	1 x tBL® - Un Locking tool for opening the RJ45 modules
	1 x tBL® - Crimp tool for crimping the cable termination blocks AWG 22-27
	1 x Jokari stripping tool 30500, no. 1-Cat 4.5 - 10 mm Cat Cable
	1 x Pliers wrench 180 mm, width across flats 35 mm
	1 x Side cutter, 125mm
	0.2 x UNINET 7702 4P flex S/FTP, 4x2xAWG 26, Pimf, LSOH, Color: grey
	0.6 x Draka - UC FUTURE COMPACT AWG26/1 Cat.7 S/FTP 24P LSHF-FR
	0.6 x Draka - UC FUTURE COMPACT AWG26/1 Cat.7 S/FTP 3x4P LSHF
	0.2 x tBL® - S/FTP 4P AWG23/1 Cat.7 _A LSHF-FR

tBL® - RJ45 DC 6fold Module Cat.6_A ISO/IEC

System platforms	tML®/ tSML
	4x tBL® - 6fold Modules can be integrated in a tSML - TP Module.
	1x tBL® - 6fold Module can be integrated in a tML® - TP Module.
Equipping	6x tBL® RJ45 DC Module Cat.6 _A

tBL® - RJ45 DC-Module Cat.6_A ISO/IEC w/o termination block, GHMT certified

Mechanical properties

Type	RJ45 Jack shielded
Connector standard	IEC 60603-7-5-1
Certification	GHMT
Installation dimension	19.3 x 14.7 mm
Mating force	≤30 N
Mating cycles (RJ45 side)	≥750
Mating cycles (opposite side)	≥100
Housing material	nickel-plated die-cast zinc

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Insulation components material	PC aqua
Gold plating in contact area	30 µ"
Contacting	AWG 27-22
Cable diameter	5-10 mm

Environmental requirements

Connection class	IP20
Temperature range	-40°C to +70°C

Electrical properties

Contact resistance	≤20 mΩ
Insulation resistance between contacts	≥500 MΩ
Dielectric withstanding voltage contact – contact	≥1000 V DC/AC
Dielectric withstanding voltage contact – screen	≥1500 V DC/AC
Current-carrying capacity at 50°C	1.25 A
PoE+ per IEEE 802.3at	PoE+

Transmission characteristics

10 GbE	supported
Cat.6A	ISO/IEC 11801 AM1 and AMD2, Link length: >1 m

tBL[®] - termination block AWG 26-27, transparent white for stranded cables

Construction	plastic with insulation displacement connection
Gold plating termination block	30 µ"
Color	transparent white
Application	Flex cable AWG 26 - AWG 27, alternative AWG 26 Solid Wire
	Plug bears small flag-like installation guide with color codes for pin-out according to EIA/TIA 568 A and B.

tBL[®] - termination block AWG 22-24, transparent yellow for installation cables

Construction	plastic with insulation displacement connection
Gold plating termination block	30 µ"
Color	transparent yellow
Application	Installation cable with solid wire, AWG 22 to AWG 24 and flex.
	Plug bears small flag-like installation guide with color codes for pin-out according to EIA/TIA 568 A and B.

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tBL® - RJ45 Keystone Module Cat.6_A ISO/IEC tool-less, AWG 22-24

Mechanical properties

Type	RJ45 Jack shielded
Connector standard	IEC 60603-7-51
Installation dimension	19.3 x 14.6 mm
Mating force	≤ 30 N
Mating cycles (RJ45 side)	≥ 750
Mating cycles (opposite side)	≤ 5
Housing material	nickel-plated die-cast zinc
Insulation components material	PC aqua
Gold plating in contact area	50 μ"
Gold plating IDC	min. 3-6 μm (120-240μin) Sn
Contacting	AWG 22-24 Solid-execution
Cable diameter	5-10 mm
EC Directive 2002/95/EC (RoHS)	RoHS conform
	GHMT certified

Environmental requirements

Connection class	IP20
Temperature range	-40°C to +70°C

Electrical properties

Contact resistance	≤ 20 mΩ
Insulation resistance between contacts	≥ 500 MΩ
Dielectric withstanding voltage contact – contact	≥ 1000 V DC/AC
Dielectric withstanding voltage contact – screen	≥ 1500 V DC/AC
Current-carrying capacity at 50°C	1.25 A
PoE+ per IEEE 802.3at	PoE+
Transfer Impedance at 1 MHz	≤ 100 mΩ
Transfer Impedance at 10 MHz	≤ 200 mΩ
Transfer Impedance at 80 MHz	≤ 1600 mΩ

Transmission characteristics

10 GbE	supported
Cat.6 _A	ISO/IEC 11801 AM1 and Am02, Link length: > 5 m

tBL® - RJ45 Keystone Module Cat.6_A ISO/IEC w/o termination block

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Mechanical properties

Type	RJ45 Jack shielded
Connector standard	IEC 60603-7-5-1
Installation dimension	19.3 x 14.7 mm
Mating force	≤ 50 N
Mating cycles (RJ45 side)	≥ 750
Mating cycles (opposite side)	≥ 100
Housing material	nickel-plated die-cast zinc
Insulation components material	PC aqua opak
Gold plating in contact area	50 µ"
Gold plating IDC	30 µ"
Cable diameter	5-10 mm

Environmental requirements

Connection class	IP20
Temperature range	-40°C to +70°C

Electrical properties

Contact resistance	≤ 20 mΩ
Insulation resistance between contacts	≥ 500 MΩ
Dielectric withstanding voltage contact – contact	≥ 1000 V DC/AC
Dielectric withstanding voltage contact – screen	--
Current-carrying capacity at 50°C	1.25 A
PoE+ per IEEE 802.3at	PoE+

Transmission characteristics

10 GbE	supported
Cat.6 _A	ISO/IEC 11801 AM1 and AMD2, Link length: > 1 m

LiD Function

supply voltage	12 V DC
lightdetection	≥ 200 m
light exits	≤ 20

tBL® - RJ45 Keystone Module Cat.6_A ISO/IEC, termination block AWG 22-24, angled

tBL® - TP sample case

Mechanical properties

Type	RJ45 Jack shielded, angled
Connector standard	IEC 60603-7-5-1
Installation dimension	19.3 x 14.7 mm
Mating force	≤ 30 N
Mating cycles (RJ45 side)	≥ 750
Mating cycles (opposite side)	≥ 100
Housing material	nickel-plated die-cast zinc
Insulation components material	PC aqua opak
Gold plating in contact area	50 µ"
Gold plating IDC	30 µ"
Cable diameter	5-9.5 mm
Cable outlet	75°

Environmental requirements

Connection class	IP20
Temperature range	-40°C to +70°C

Electrical properties

Contact resistance	≤ 20 mΩ
Insulation resistance between contacts	≥ 500 MΩ
Dielectric withstanding voltage contact – contact	1000 V DC/AC peak
Dielectric withstanding voltage contact – screen	1500 V DC/AC peak
Current-carrying capacity at 50°C	1.25 A
PoE+ per IEEE 802.3at	PoE+

Transmission characteristics

10 GbE	supported
Class E _A	ISO/IEC 11801 AM1 and AMD2, Link length: > 5 m
Cat.6 _A	ISO/IEC 11801 AMD2

tBL® - Open design data outlet

TBL-UP50-2RJ45KS-RW	tBL® - wall outlet (open design) 45° for 2x Keystone Modules incl. central plate 50x50mm, RAL9010
TBL-UPD2RJ45KS	tBL® - wall outlet (open design) 45° for 2x Keystone Modules

tBL® - Extender Cat.6_A ISO/IEC with 2x termination block AWG 22-24

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Properties

Connector Standard	IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T; 1GBase-T; 10GBase-T; IEEE 802.5; 16 MB; ISDN; FDDI; ATM, Telefon
Mating force	≤30 N
Mating cycles	≥750
Housing material	nickel-plated die-cast zinc
Insulation components material	PC aqua
Gold plating in contact area	30 μ"
Cable diameter	5-10 mm
Installation	screw
EMC	360°-shielding
Electrical specifications	Cat.6 _A , the extended link class E _A
Length	Link length up 90 m

Environmental requirements

Connection class	IP20
Temperature range	-40°C to +70°C

Electrical properties

Contact resistance	≤20 mΩ
Insulation resistance between contacts	≥500 MΩ
Dielectric withstanding voltage contact – contact	≥1000 V DC/AC
Dielectric withstanding voltage contact – screen	≥1500 V DC/AC
Current-carrying capacity at 50°C	1.25 A
PoE+ per IEEE 802.3at	PoE+

Transmission characteristics

10 GbE	supported
Cat.6 _A	ISO/IEC 11801

tBL[®] - DIN Rail Housing for 1x RJ45 Keystone Module

Material	plastic
Color	grey, RAL 7035
Mounting	on DIN Rail by simple snap-in
	QS-Managementsystem ISO 9001, ISO 14001 and TL 9000

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tBL® - wall outlet (open design) 45° for 2x Keystone Modules incl. central plate 50x50mm, RAL9010

Central plate material	die-cast zinc
Color	white, similar to RAL 9010
Central plate	50 x 50mm
Application	Installation in cable conduits, flush or surface mounting
tBL® - Keystone compatibility	tBL® - RJ45 Keystone Module Cat.6 _A ISO/IEC tool-less, AWG 22-24 (P/N TBL-RJ45KS-TL)
	tBL® - RJ45 Keystone Module Cat.6 _A ISO/IEC angled, AWG 22-27 (P/N TBL-RJ45KSW, TBL-RJ45KSW/KT22, TBL-RJ45KSW/KT26)

tBL® - wall outlet 45° for 3x Keystone Modules incl. frame 80x80mm, RAL9010

Material	Central plate: die-cast zinc / Frame: plastic
Color	white, similar to RAL 9010
Components	50 x 50mm central plate, 80 x 80mm frame
Application	Installation in wall trunking, flush or surface mounting
tBL® - Keystone compatibility	tBL® - RJ45 Keystone Module Cat.6 _A ISO/IEC tool-less, AWG 22-24 (P/N TBL-RJ45KS-TL)
	tBL® - RJ45 Keystone Module Cat.6 _A ISO/IEC for termination blocks (P/N TBL-RJ45KS / TBL-RJ45KS/KT22 / TBL-RJ45KS/KT26)

tBL® - Pulling Aid for cable termination block

Material	plastic
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tBL® - Un Locking tool for opening the RJ45 modules

tBL® - Crimp tool for crimping the cable termination blocks AWG 22-27

Application	To crimp the tBL® cable termination blocks AWG 22 - AWG 27
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Jokari stripping tool 30500, no. 1-Cat 4.5 - 10 mm Cat Cable

Usage	Stripping of sheathing of round cables and stripping of shielding foils
Capacity	Ø 4.5 - 10 mm
Cable types	PVC-insulated data cables with thin sheathing, e.g. Cat5, Cat6, Cat7, Twisted-Pair-cables

Material

Body	polyamide (PA)
Blades	special steel, hardened and tempered, Titan-Nitride coated

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Dimensions

Lenght	100 mm
Width	18 mm
Height	18 mm
Marking space	31 x 5 mm
Weight	22 g

Pliers wrench 180 mm, width across flats 35 mm

Material

Head	chrome vanadium steel
	nickel-plated
Handle	with plastic coated

Capacity

Workspace	to 35 mm
Lenght	180 mm
Weight	260 g

Side cutter, 125mm

Material

Head	burnished
Handle	with two-colour mulit-component handles wrap

Capacity

Lenght	125 mm
Weight	45 g

Performance

Cutting capacity wire (hard)	0.6 mm
Cutting capacity wire (medium)	1.2 mm
Cutting capacity wire (soft)	1.6 mm

UNINET 7702 4P flex S/FTP, 4x2xAWG 26, Pimf, LSOH, Color: grey

Electrical characteristics

Category				5e	6	6 _A	7		
Frequency	1 MHz	4 MHz	10 MHz	100 MHz	250 MHz	500 MHz	600 MHz	800 MHz	862 MHz

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Attenuation	0.26 dB/10m	0.5 dB/10m	0.79 dB/10m	2.67 dB/10m	4.3 dB/10m	6.2 dB/10m	6.71 dB/10m	7.9 dB/10m	8.3 dB/10m
NEXT	100 dB	100 dB	100 dB	100 dB	95 dB	92 dB	90 dB	90 dB	90 dB
ACR-N	97 dB	97 dB	97 dB	97 dB	92 dB	89 dB	87 dB	87 dB	87 dB
PS-ACR-N	100 dB/10m	99 dB/10m	99 dB/10m	97 dB/10m	91 dB/10m	86 dB/10m	83 dB/10m	82 dB/10m	82 dB/10m
ACR-F	97 dB/10m	96 dB/10m	96 dB/10m	94 dB/10m	88 dB/10m	83 dB/10m	80 dB/10m	79 dB/10m	79 dB/10m
PS-ACR-F	100 dB/10m	99 dB/10m	99 dB/10m	97 dB/10m	95 dB/10m	91 dB/10m	88 dB/10m	87 dB/10m	87 dB/10m
PS ELFEXT	97 dB/10m	96 dB/10m	96 dB/10m	94 dB/10m	92 dB/10m	88 dB/10m	85 dB/10m	84 dB/10m	84 dB/10m
Return loss	26 dB	32 dB	35 dB	30 dB	27 dB	24 dB	23 dB	21 dB	21 dB

Electrical properties

Loop resistance at 20°C	270 Ω/km
Mutual capacitance	43 pF/m
Impedance at 100 MHz	100 Ω ± 5 Ω
Transfer impedance	10 mΩ/m
Coupling attenuation	≥ 70 dB
Near end unbalance attenuation LCL	> 40 dB
Delay Skew	4 ns/100 m
NVP	78 %

Mechanical characteristics

Bending radius	≥ 20 mm
Repeated bending	≥ 1000 cycles
Tensile strength	≤ 56 N
Crush resistance max.	600 N / 10 cm
Temperature range during installation	0°C to +50°C
Temperature range in operation	-20°C to +60°C

General Characteristics

Wire colour code	white /blue
	red/orange
	black/green
	yellow/brown
	in accordance with IEC 60189 and IEC 60708
Zero halogen, non corrosive gases	IEC 60754-1/-2, EN 50267-2-1/-2-2, (VDE 0482-267-2-1/-2-2) - applies to FRNC/LSOH
Flame propagation	IEC 60332-1-2, EN 60332-1-2 (VDE 0482-332-1-2)
Smoke density	IEC 61034-1/-2, EN 61034-1/-2, (VDE 0482-1034-1/-2) - applies to FRNC/LSOH
Reaction to fire (Euroclasses)	EN 13501-6: D _{ca} -s2,d1,a1
PoE	IEEE 802.3af
EMV	shielded
Segregation class	c
Cat./Class	Cat 7 / Class F - limit values as specified by IEC 61156-6 and EN 50288-4-2 guaranteed

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Dimension	4 x 2 x 0.132 (AWG26)
Mantel	FRNC/LSOH
Øüber Mantel	5.8 mm
Gewicht	39.5 kg/km
Cu-Zahl	18.1 kg/km
Brandlast	0.11 kWh/m
	0.38 MJ/m

Draka - UC FUTURE COMPACT AWG26 Cat.7 S/FTP 24P LSHF-FR

Construction

Type	UC FUTURE COMPACT AWG26/1 Cat.7 S/FTP 24P
Conductor	Bare copper wire, diameter 0.4 mm (AWG26)
Insulation	Foam-skin PP, diameter 1.0 mm
Twisting	2 insulated wires to the pair
Pair screening	Pet-Al foil around each pair
Stranding	6 (5+1) bundles with 4 foiled pairs blue, orange, green, brown
	Coloured tapes are around each bundle
Screen	Tinned copper braid 85% coverage
Sheath	LSHF-FR, diameter 13.9 mm

Application

IEEE 802.3: 10Base-T; 100Base-T; 10GBase-T, ISDN; xDSL

IEEE 802.5 16 MB; ISDN; TPDDI; ATM155Mbit/s

The conductor diameter is smaller compared to the standard installation cables. This leads to an increased attenuation and therefore the

operating distance is reduced (60m instead of 90m installation cable in standard permanent link).

Standards

IEC 61156-6 work area cable

ISO/IEC 11801 2nd ed.

EN 50173-5

EN 50288-4-2

Flame resistance

PVC IEC 60332-1

LSHF-FR IEC 60332-3-24; IEC 60754-2; IEC 61034 ; EN 50399 Class D_{ca}

Mechanical properties

Minimum bending radius	Without load	≥ 55 mm
	With load	≥ 110 mm
Temperature range	During operation	-20°C up to +60°C

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	During installation	10°C up to +40°C
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Electrical properties at 20°C

Loop resistance		≤ 280 Ω/km
Resistance unbalance		≤ 2%
Test voltage	core/core	1000 V _{DC} 1 min
	core/screen	1000 V _{DC} 1 min
Capacitance	800 Hz	Nom. 44 nF/km
Capacitance unbalance		≤ 1600 pF/km
Impedance	100 MHz	100 Ω ± 5 Ω
Nominal velocity of propagation		ca. 76%
Insulation resistance	500 V	≥ 2000 MΩkm
Transfer impedance	at 1 MHz	≤ 5 mΩ /m
	at 10 MHz	≤ 5 mΩ /m
	at 30 MHz	≤ 10 mΩ /m

Electrical Data (nominal) acc. to Cat.7 (at 20°C)

F	Atten- uation	NEXT	PS- NEXT	ELFEXT	PS- ELFEXT	Return loss
MHZ	dB/10m	dB	dB	dB/100m	dB/100m	dB
1.0	0.3	90	87	80	77	23
4.0	0.6	90	87	80	77	24
10.0	1.0	90	87	80	77	25
16.0	1.3	90	87	76	73	25
20.0	1.4	90	87	74	71	25
31.2	1.8	90	87	70	67	25
62.5	2.6	90	87	64	61	23
100.0	3.2	87	84	60	57	21
125.0	3.6	85	82	58	55	20
155.5	4.0	84	81	56	53	19
175.0	4.3	83	80	55	52	19
200.0	4.6	82	79	54	51	18
250.0	5.1	81	78	52	49	18
300.0	5.6	80	77	50	47	17
450.0	6.9	77	74	47	44	17
600.0	7.9	75	72	44	41	17

Technical Data

Designation	J-02YS(ST)CH
Type	24x2x0.4PiMF
Outer diameter	13.9 mm
Fire load	2.171 MJ/km

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Fire load	0.603 kWh/m
Reaction to Fire	D _{ca} -s2, d2, a1
Weight	230 kg/km
Copper content	115 kg/km
Tensile force	500 N

Draka - UC FUTURE COMPACT AWG26 Cat.7 S/FTP 3x4P LSHF

Application

IEEE 802.3: 10Base-T; 100Base-T; 10GBase-T, ISDN; xDSL

IEEE 802.5 16 MB; ISDN; TPDDI; ATM155Mbit/s

The conductor diameter is smaller compared to the standard installation cables. This leads to an increased attenuation and therefore the

operating distance is reduced (60 m instead of 90 m installation cable in standard permanent link).

Standards

IEC 61156-6 work area cable

ISO/IEC 11801 2nd ed.

EN 50173-5

EN 50288-4-2

Flame resistance

IEC 60332-1, IEC 60754-2, IEC 61034; EN 50399 Class D_{ca}

Construction

Conductor	Bare copper wire, Ø 0.4 mm (AWG26)
Insulation	Foam skin PP, diameter 1.0 mm (+/- 0.05)
Twisting	2 cores to the pair
Pair screening	Al-laminated plastic foil
Sheath	LSHF orange RAL 2003
Stranding	3 bundles with 4 foiled pairs (blue, orange, green and brown)

Mechanical properties

Bending radius	Installation	8x Outer diameter
	Installed	4x Outer diameter
Temperature range	During operation	-20°C up to +60°C
	During installation	10°C up to +40°C

Electrical properties at 20°C ± 5°C

Loop resistance	≤ 176 Ω/km
Resistance unbalance	≤ 2%

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Test voltage	core/core	1000 V _{DC} 1 min
	core/screen	1000 V _{DC} 1 min
Mutal capacitance	800 Hz	Nom. 43 nF/km
Capacitance unbalance		≤ 1500 pF/km
Mean impedance	100 MHz	100 ± 5
Nominal velocity of propagation		ca. 79%
Propagation delay	Nominal	< 450 ns/100m
Delay skew	Nominal	< 15 ns/100m
Insulation resistance	500 V	≥ 2000 MΩkm
Transfer impedance	at 1 MHz	≤ 50 mΩ /m
	at 10 MHz	≤ 100 mΩ /m
	at 30 MHz	≤ 200 mΩ /m
	at 100 MHz	≤ 1000 mΩ /m
Coupling attenuation		≥ 55 dB

Electrical Data (nominal) acc. to Cat.7 (at 20°C)

F	Atten- uation	NEXT	PS- NEXT	ELFEXT	PS- ELFEXT	Return loss
MHZ	dB/10m	dB	dB	dB/100m	dB/100m	dB
1.0	0.3	90	87	80	77	23
4.0	0.6	90	87	80	77	24
10.0	1.0	90	87	80	77	25
16.0	1.3	90	87	76	73	25
20.0	1.4	90	87	74	71	25
31.2	1.8	90	87	70	67	25
62.5	2.6	90	87	64	61	23
100.0	3.2	87	84	60	57	21
125.0	3.6	85	82	58	55	20
155.5	4.0	84	81	56	53	19
175.0	4.3	83	80	55	52	19
200.0	4.6	82	79	54	51	18
250.0	5.1	81	78	52	49	18
300.0	5.6	80	77	50	47	17
450.0	6.9	77	74	47	44	17
600.0	7.9	75	72	44	41	17

Technical Data

Type	3x4x2x0.4 PiMF
Outer diameter	12.5 mm
Fire load	1636 MJ/km
Fire load	0.453 kWh/m
Weight	145 kg/km
Copper content	xx kg/km
Tensile force	300 N

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tBL® - S/FTP 4P AWG23/1 Cat.7_A LSHF-FR

Construction

Conductor	Bare copper wire Ø 0.58 mm (AWG 23/1)
Insulation	Foam-Skin PE, Ø 1.4 mm
Twisting	2 cores to the pair
Pair screen	Al-laminated plastic foil
Cable lay up	4 pairs
Screen	Copper braid, tinned (approx. 65%)
Sheath	Halogen free, flame and fire retardant sheathing material: LSHF-FR (LSFROH), yellow, (RAL 1028)

Mechanical properties

Minimum bending radius	Without load	≥ 30 mm
	With load	≥ 60 mm
Temperature range	During operation	-20°C up to +60°C
	During installation	0°C up to +50°C

Electrical properties at 20°C ± 5°C

Loop resistance		≤ 135 Ω/km
Resistance unbalance		≤ 2%
Insulation resistance	500 V	≥ 5000 MΩ*km
Mutual capacitance	at 800 Hz	Nom. 43 nF/km
Capacitance unbalance	(pair/ground)	≤ 1500 pF/km
Characteristic impedance	100 MHz	(100 ± 5) Ω
Nominal velocity of propagation		ca. 76%
Propagation delay		439 ns/100m
Delay skew		12 ns/100m
Test voltage	(DC, 1 min) core/core and core/screen	1000 V
Transfer impedance	at 1 MHz	≤ 5 mΩ/m
	at 10 MHz	≤ 5 mΩ/m
	at 30 MHz	≤ 10 mΩ/m
Coupling attenuation		≥ 85 dB

Electrical properties (nominal) at 20°C

F	Attenuation	NEXT	PS-NEXT	ACR	PS-ACR	ELFEXT	PS-ELFEXT	Returnloss
MHZ	dB/100m	dB	dB	dB/100m	dB/100m	dB/100m	dB/100m	dB
1.0	1.8	100	97	98	95	105	103	22
4.0	3.4	100	97	97	94	93	91	25
10.0	5.4	100	97	95	92	85	83	27
16.0	6.8	100	97	93	90	81	79	27
20.0	7.7	100	97	92	89	79	77	27
31.2	9.6	100	97	90	87	75	73	26

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62.5	13.7	100	97	86	83	69	67	24
100.0	17.4	100	97	83	80	65	63	22
125.0	18.6	95	92	76	73	63	61	21
155.5	19.5	95	92	75	69	61	59	21
175.0	22.1	92	89	70	67	60	58	20
200.0	25.0	92	89	67	64	59	57	20
250.0	28.1	90	87	62	59	57	55	19
300.0	30.9	89	86	58	55	55	53	19
450.0	37.4	87	84	50	47	52	50	19
600.0	44.8	85	82	40	37	49	47	19
750.0	50.5	83	80	32	29	59	56	19
900.0	55.9	82	79	26	23	58	55	19
1000.0	58.5	82	79	24	21	57	54	19
1200.0	63.4	81	78	19	16	52	49	17

Outerdiameter	7.8 mm
Fire load	589 MJ/km
Weight	68 kg/km
Copper content	39 kg/km
Tensile force	340 N

Product variants & accessories

Art.-No.	Description
TBL-MUSTER-KOFFER-CU	tBL [®] - TP sample case