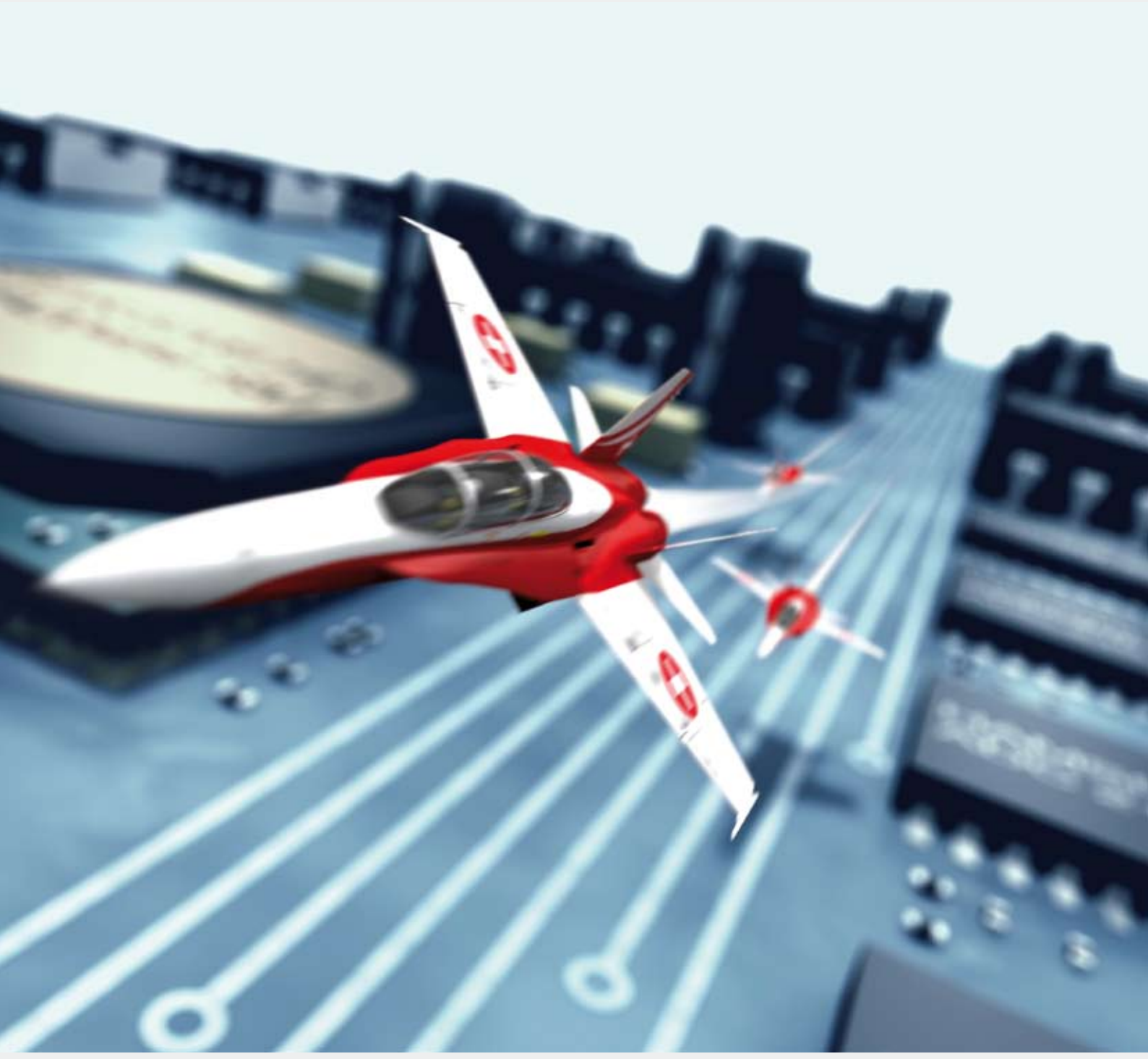
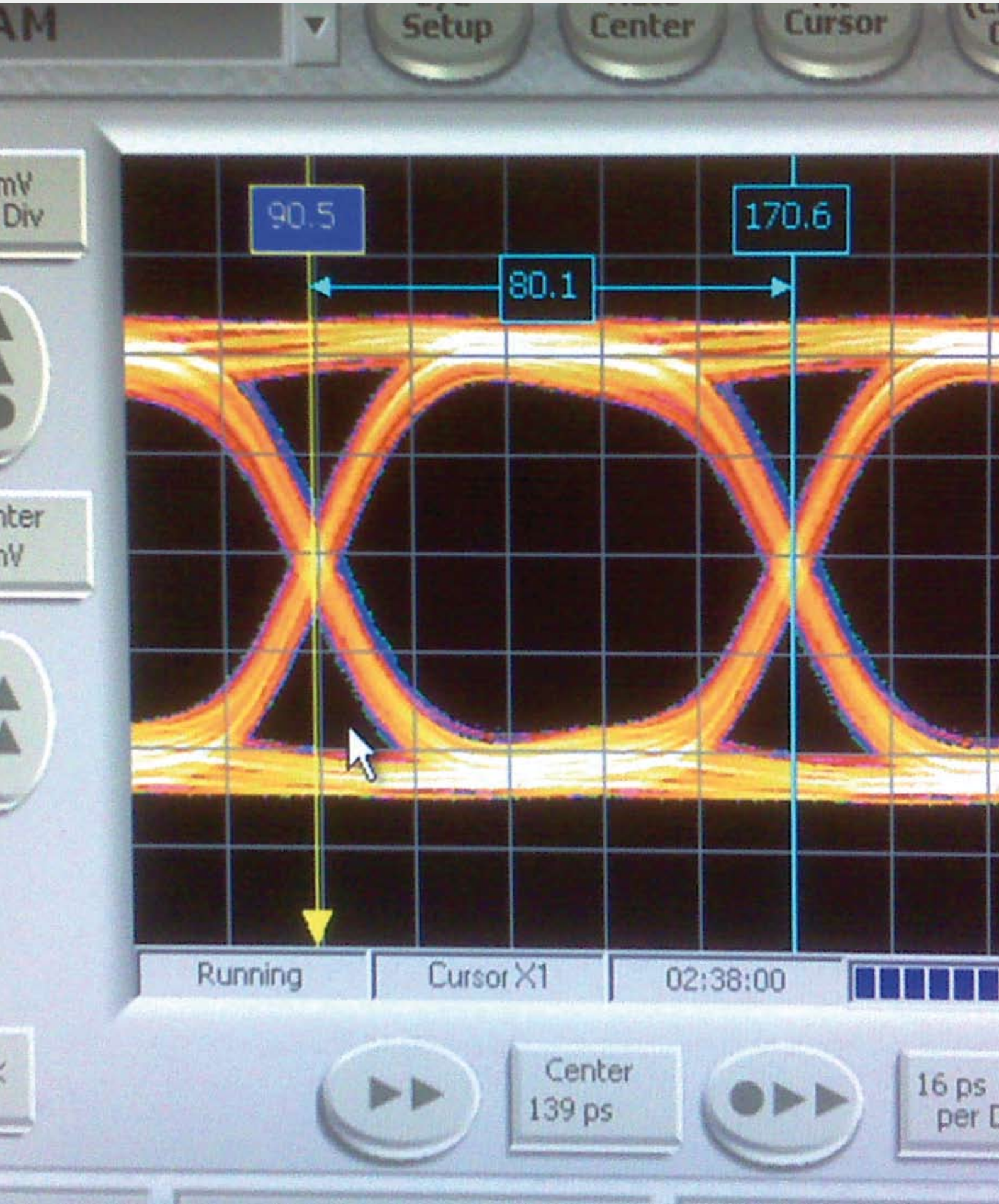
High Speed Digital
Testing Solutions

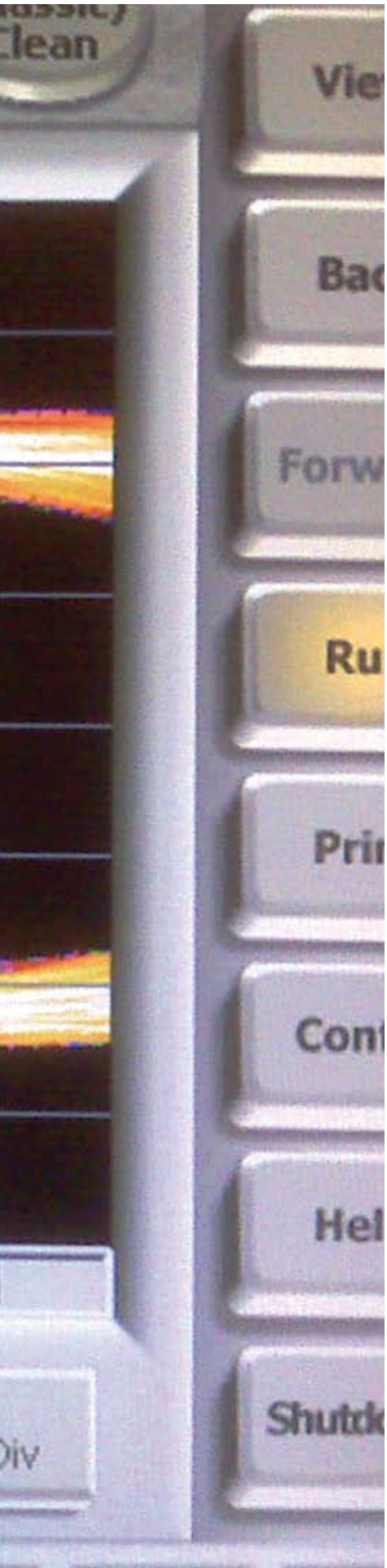
Edition 2011



HUBER+SUHNER
Excellence in Connectivity Solutions

Maximise your Signal Integrity





Your partner for system solutions

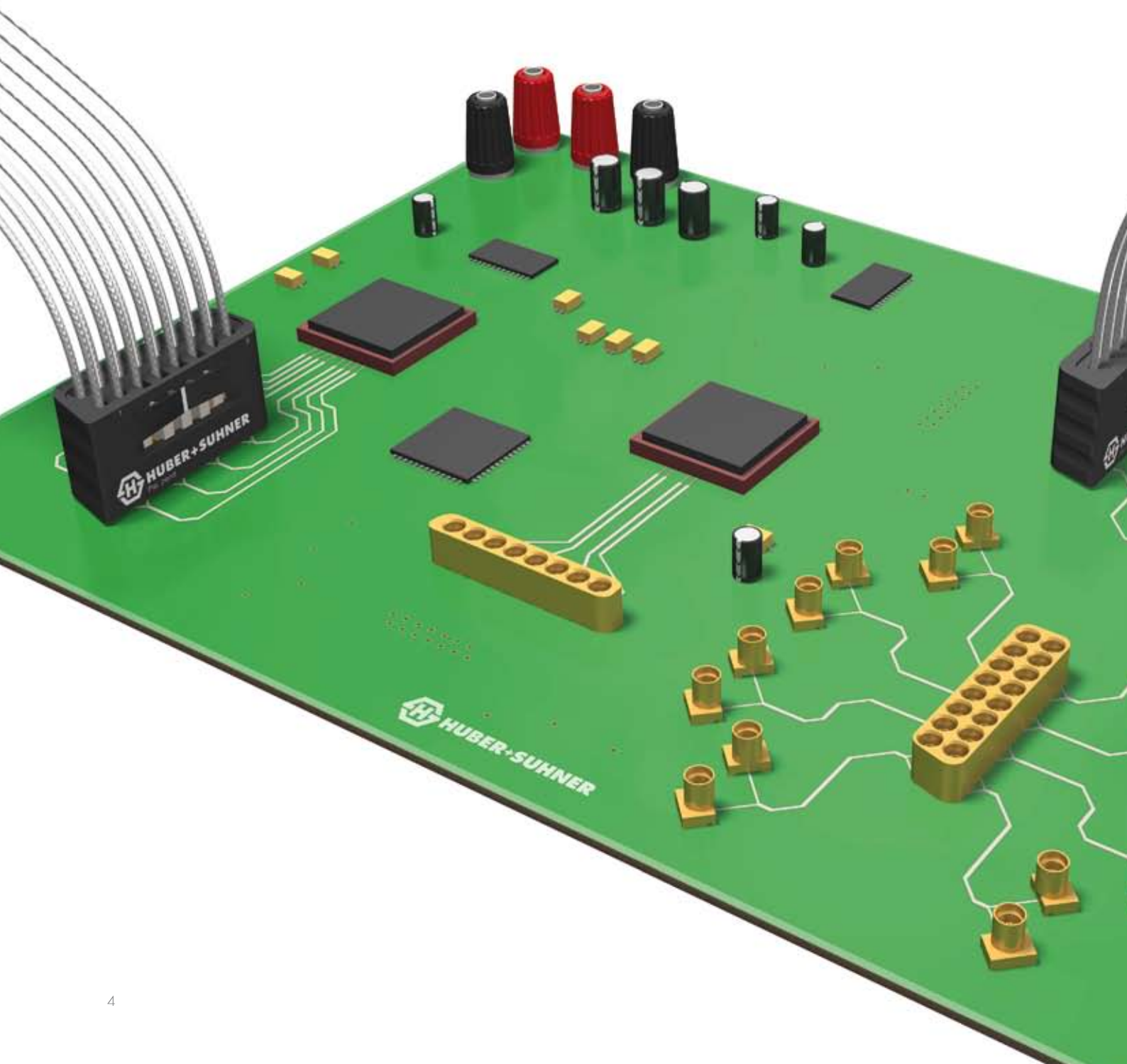
The HUBER+SUHNER Group is a leading global supplier of components and systems for electrical and optical connectivity. We offer technical expertise in radio frequency technology, fiber optics and low frequency under one roof, thus providing a unique basis for continual innovation focused on the needs of our customers all over the world.

The innovative high speed digital testing solution supplier

HUBER+SUHNER is offering a broad range of high end RF test components and assemblies developed and optimized for high speed digital testing. We stand for highest density, lowest loss and highest performance coaxial-to-PCB transitions and cabling solutions. Our solutions include extensive technical support, libraries of 3D-files, electrical modelling data and customer specific optimized footprints.

Content

What High Speed Digital Testing demands



High speed digital chip verification – bench top testing

- Lowest loss from the device under test to the test equipment
- Best signal integrity performance
- Dense and space saving PCB connectivity solutions
- PCB connectivity closest to the device under test
- Proven and tested solutions and components

High speed digital hardware and system verification

Additional benefits regarding high speed digital systems

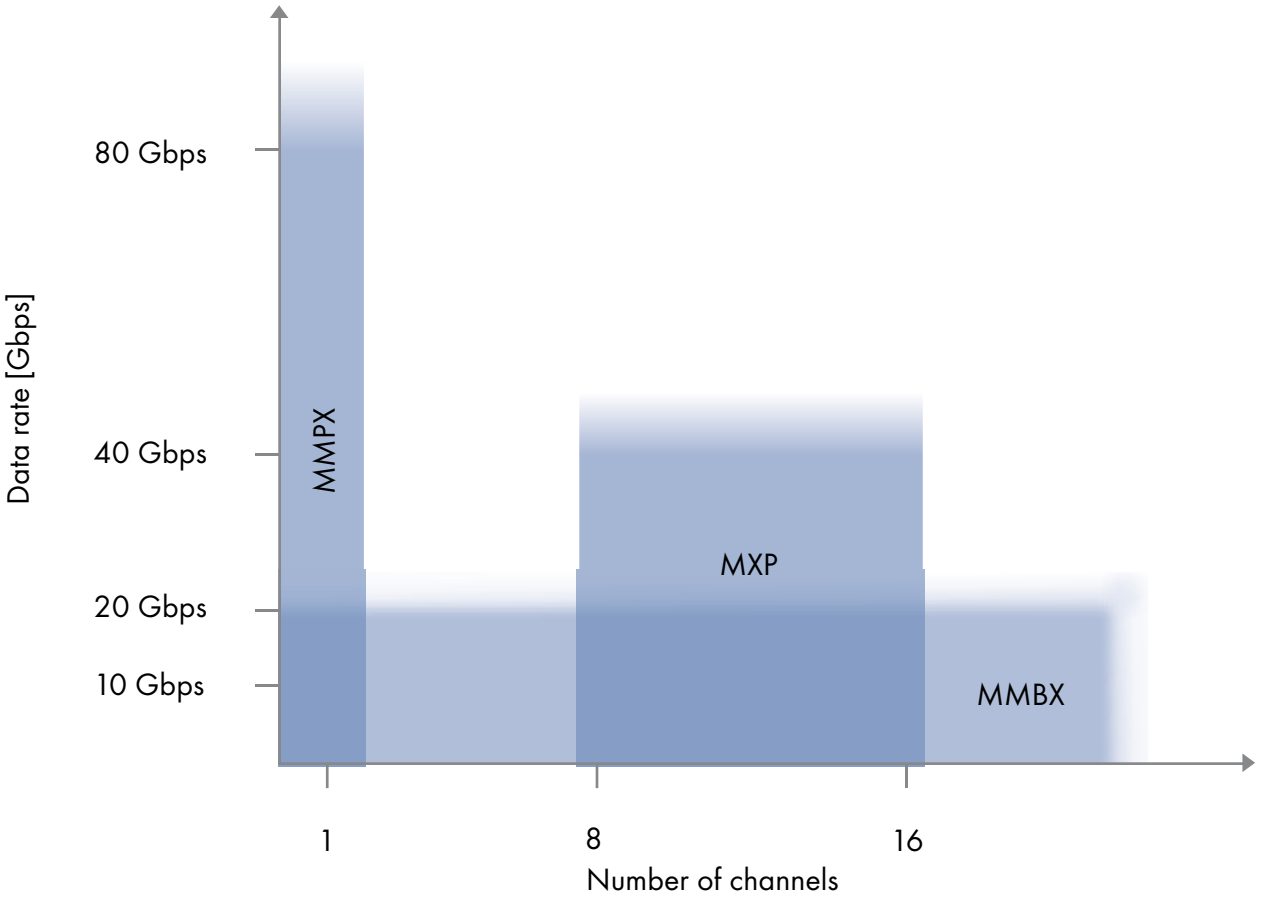
- Multicoax PCB edge mount and PCB panel mount solutions
- Multicoax interconnectivity between systems and modules with customized solutions

Automated test equipment

For internal and external interconnectivity of complex automated test equipment systems HUBER+SUHNER offers customer specific solutions based on

- Multicoax interfaces up to 40 Gbps / 40 GHz
- Snap-on interfaces up to 80 Gbps / 67 GHz
- RF cabling solutions optimized for highest data rates and frequencies, lowest loss, best phase matching and highest flexibility

HUBER+SUHNER High Speed Digital Testing Solutions Overview



MMPX – the 80 Gbps snap-on solution
for data rates up to 80 Gbps and a maximum operating frequency of 67 GHz is based on

- MMPX connectors
- MULTIFLEX 86 and semi-rigid cable assemblies

MXP – the 40 Gbps multicoax solution
for data rates up to 40 Gbps and a maximum operating frequency of 40 GHz is based on

- MXP connectors
- MULTIFLEX 53 cable assemblies
- SUCOFLEX 102 cable assemblies
- SUCOFLEX 404 cable assemblies

MMBX – the 20 Gbps multicoax board-to-board solution
for data rates up to 20 Gbps and a maximum operating frequency of 12.4 GHz is based on

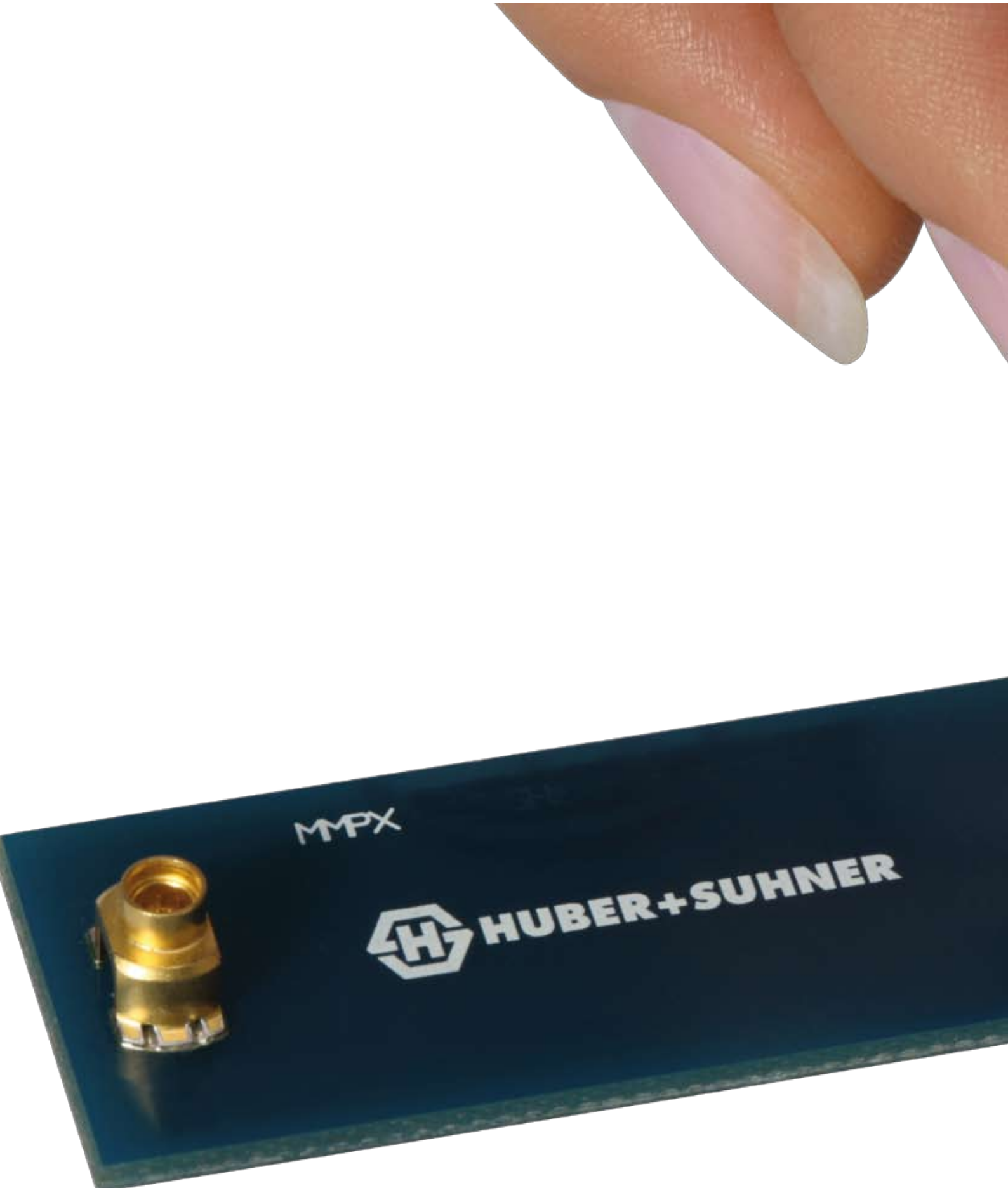
- MMBX connectors

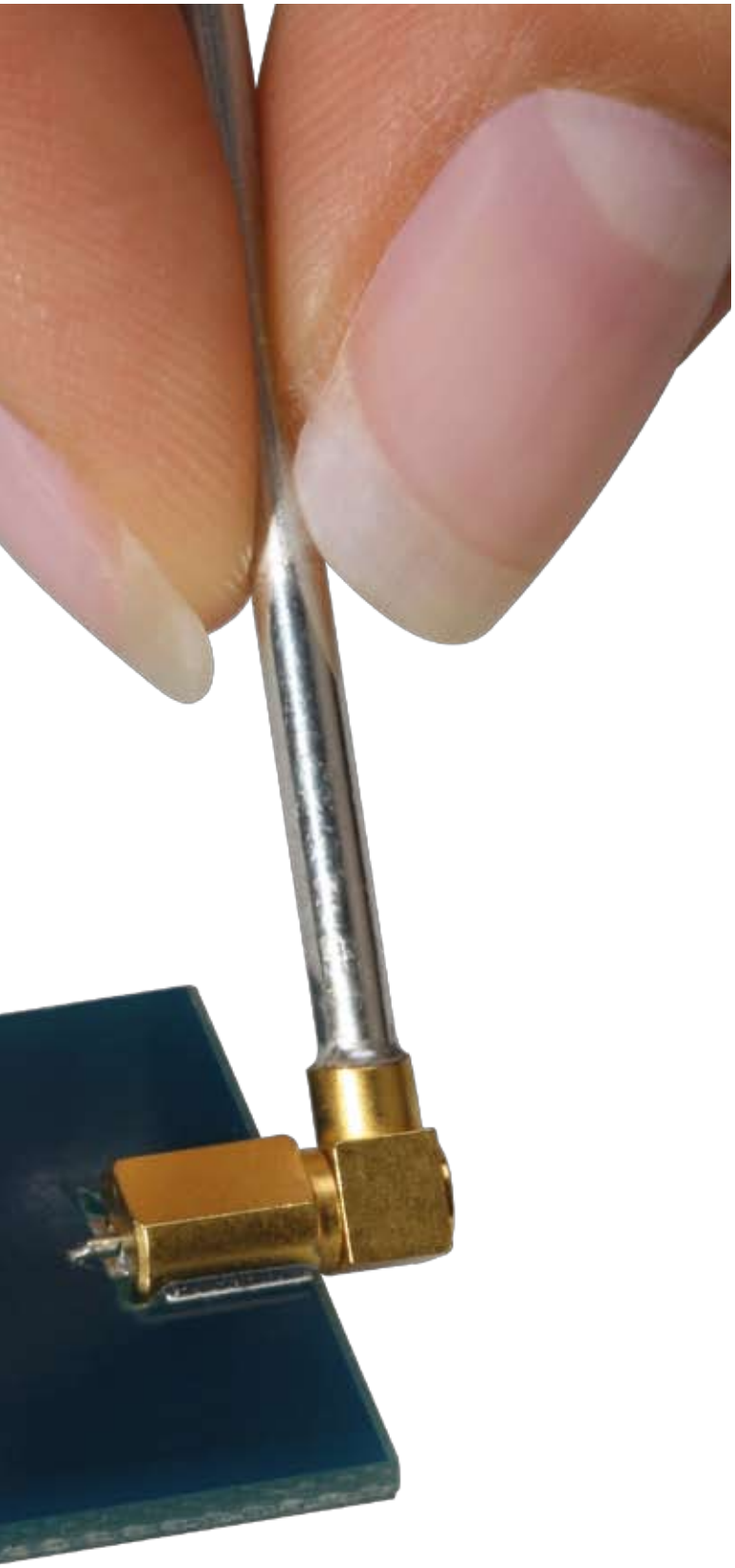
The 20 Gbps multicoax board-to-board solution based on MMBX

The 40 Gbps multicoax solution based on MXP

The 80 Gbps snap-on solution based on MMPX

The 80 Gbps snap-on Solution – MMPX / MULTIFLEX 86 / Semi-Rigid





Features

- True 80 Gbps / 67 GHz coaxial-to-PCB transition
- Highest electrical performance (return loss and shielding)
- Standard phase matching of +/- 1 ps per channel
- Via-in-pad capable
- 5.08 mm pitch (0.2 inch)
- Mechanical robust design
- Extensive technical support
- 3D-files, modelling data and generic footprints available

Benefits MMPX interface

- Quick and reliable snap-on mating
- Very user friendly
- One connector for several applications
- Space saving on PCB
- Overall cost savings and service benefits
- Fully characterized adapters to 1.85 mm and 2.92 mm connectors available for de-embedding (see pages 50/51)

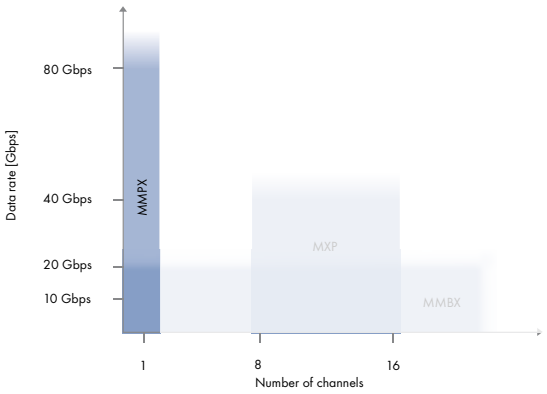
Benefits MULTIFLEX 86 cable

- Optimized regarding highest cut-off frequency, electrical loss and phase stability
- Flexible alternative to semi-rigid cables

Comprehensive range of standard products

- Various PCB connector types (SMT)
- Adapters between MMPX and PC 1.85 (1.85 mm standard) or PC 2.92 [SK] (2.92 mm standard)
- Standard MULTIFLEX 86 cable assembly lengths with MMPX, PC 1.85 or PC 2.92
- Decoupling tools for easy and safe connector decoupling

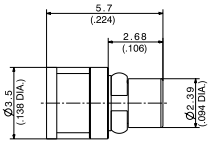
The 80 Gbps snap-on Solution – MMPX / MULTIFLEX 86



CABLE CONNECTORS

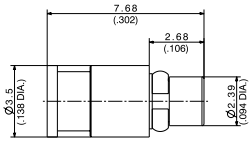
Straight cable plugs (male)

- For semi-rigid cables
- Cable entry soldered
- Centre contact soldered
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Cable	Packaging	Notes
11_MMPX-50-2-1/111_NE	84022225	EZ 86, STORM SR 86	single	Precision interface, air dielectric only

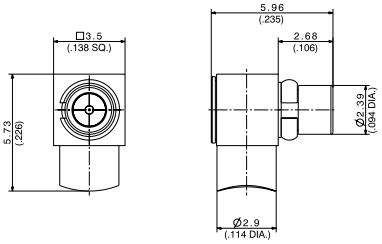
- For semi-rigid, semi-flexible and flexible cables
- Cable entry soldered
- Centre contact plugged
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Cable	Packaging	Notes
11_MMPX-50-1-4/111_NE	84122130	MULTIFLEX 53	single	Available on request
11_MMPX-50-2-2/111_NE	84022228	EZ 86, SUCOFORM 86, STORM SR 86	single	For semi-rigid and HUBER+SUHNER SUCOFORM cables
11_MMPX-50-2-3/111_NE	84089228	MULTIFLEX 86	single	For HUBER+SUHNER MULTIFLEX 86 cables

Right angle cable plugs (male)

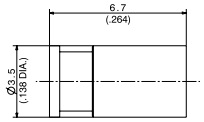
- For semi-rigid, semi-flexible and flexible cables
- Cable entry soldered
- Centre contact plugged
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Cable	Packaging	Notes
16_MMPX-50-1-1/111_NE	84122132	MULTIFLEX 53	single	Available on request
16_MMPX-50-2-1/111_NE	84022227	EZ 86, SUCOFORM 86, STORM SR 86	single	For semi-rigid and HUBER+SUHNER SUCOFORM cables
16_MMPX-50-2-2/111_NE	84067778	MULTIFLEX 86	single	For HUBER+SUHNER MULTIFLEX 86 cables

Straight cable jacks (female)

- For semi-rigid and semi-flexible cables
- Cable entry soldered
- Centre contact soldered
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request

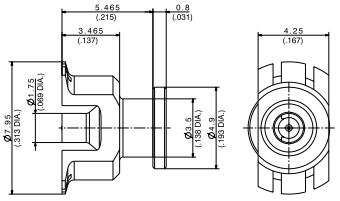


HUBER+SUHNER type	Item no.	Cable	Packaging	Notes
21_MMPX-50-2-1/111_NE	84022226	EZ 86, SUCOFORM 86, STORM SR 86	single	

PCB CONNECTORS

Straight PCB jacks (female)

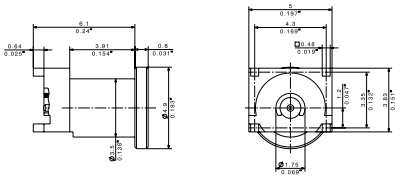
- Full surface mount type
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Packaging	Notes
82_MMPX-S50-0-2/111_NM	84096711	tape	Blister tape containing 10 pcs.
82_MMPX-S50-0-2/111_NM-1	84096752	tape and reel	Blister tape containing 750 pcs.

Straight PCB jacks (female)

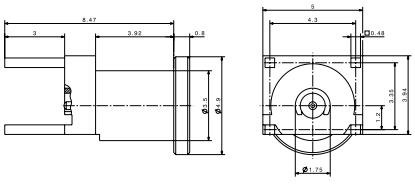
- Semi surface mount type
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Packaging	Notes
96_MMPX-50-0-2/111_NM-1	84093961	tape	Blister tape containing 10 pcs.
96_MMPX-50-0-2/111_NM	84093966	tape and reel	Blister tape containing 750 pcs.

Straight PCB jacks (female)

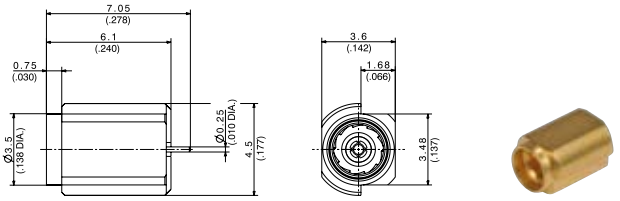
- Surface mount type SMT
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Packaging	Notes
96_MMPX-50-0-3/111_NM-1	84099981	tape	Blister tape containing 10 pcs.
96_MMPX-50-0-3/111_NM	84099988	tape and reel	Blister tape containing 500 pcs.

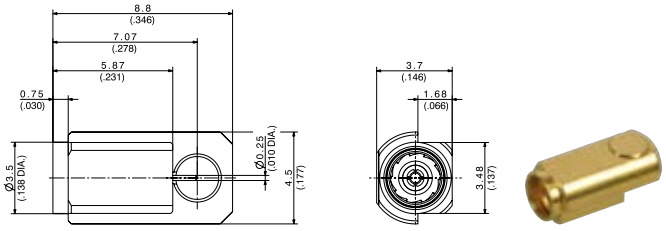
Straight PCB jacks (female) edge-mount

- Full surface mount type
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



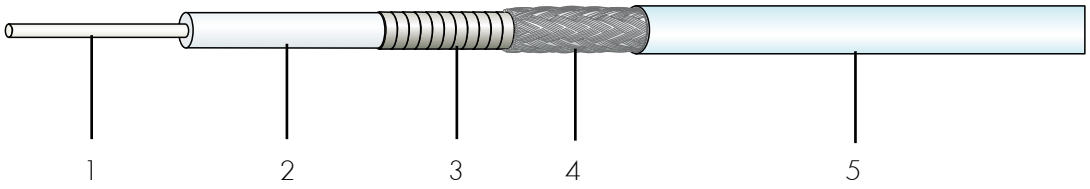
HUBER+SUHNER type	Item no.	Packaging	Notes
92_MMPX-S50-0-1/111_NM	84009138	tape	Blister tape containing 10 pcs.
92_MMPX-S50-0-1/111_NM-1	84009140	tape and reel	Blister tape containing 500 pcs.

- Full surface mount type
- Extra shielded for EMF sensitive applications
- MMPX decoupling tool recommended
- Phase matched adaptors MMPX/PC 1.85 and PC 1.85/PC 1.85 available on request



HUBER+SUHNER type	Item no.	Packaging	Notes
92_MMPX-S50-0-2/111_NE	84016110	single	Operating range 26.5 GHz only

Microwave Cable MULTIFLEX 53



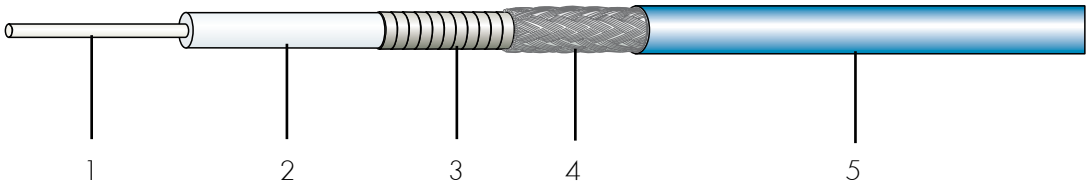
	Description	Diameter
1. Centre conductor	Solid silver-plated copper wire	0.31 mm
2. Dielectric	Solid PTFE	0.99 mm
3. 1st outer conductor	Silver-plated copper tape	1.22 mm
4. 2nd outer conductor	Silver-plated copper braid	1.42 mm
5. Jacket	Fluoroethylenepropylene, sky blue	1.74 mm

Electrical cable data					
Impedance					50 Ohm
Operating frequency					40 GHz
Capacitance					95.5 pF/m (29.1 pF/ft)
Velocity of propagation					70 %
Time Delay					4.8 ns/m (1.46 ns/ft)
Nom. attenuation*	coefficient a	1.089	coefficient b	0.032	
Max. attenuation*	coefficient a	1.143	coefficient b	0.035	
Max. operating voltage					750 Vrms
Min. screening effectiveness up to 18 GHz					90 dB

*Attenuation calculation $\alpha_{25} = a \cdot \sqrt{f}\ (GHz) + b \cdot f\ (GHz)\ (dB/m)$

General cable data	
Temperature range	-65...+165 °C
Weight	0.85 kg/100 m
Min bending radius static	10 mm

Microwave Cable MULTIFLEX 86



	Description	Diameter
1. Centre conductor	Solid silver-plated copper wire	0.47 mm
2. Dielectric	Solid PTFE	1.48 mm
3. 1st outer conductor	Silver-plated copper tape	1.71 mm
4. 2nd outer conductor	Silver-plated copper braid	2.11 mm
5. Jacket	Fluoroethylenepropylene, blue	2.65 mm

Electrical cable data					
Impedance					50 Ohm
Operating frequency					67 GHz
Capacitance					95 pF/m (29 pF/ft)
Velocity of propagation					71 %
Time Delay					4.7 ns/m (1.4 ns/ft)
Nom. attenuation*	coefficient a	0.71702	coefficient b	0.02892	
Max. attenuation*	coefficient a	0.75288	coefficient b	0.03037	
Max. operating voltage					1.5 kVrms
Min. screening effectiveness up to 18 GHz					90 dB

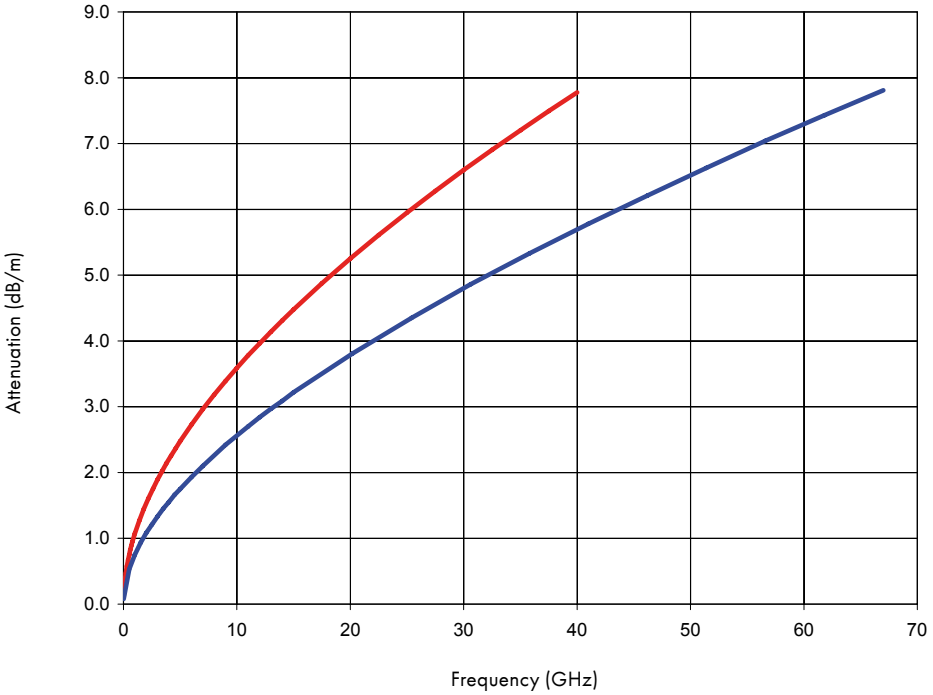
*Attenuation calculation $\alpha_{25} = a \cdot \sqrt{f}\ (GHz) + b \cdot f\ (GHz)\ (dB/m)$

General cable data	
Temperature range	-65...+165 °C
Weight	2.1 kg/100 m
Min bending radius static	6 mm

Cable attenuation

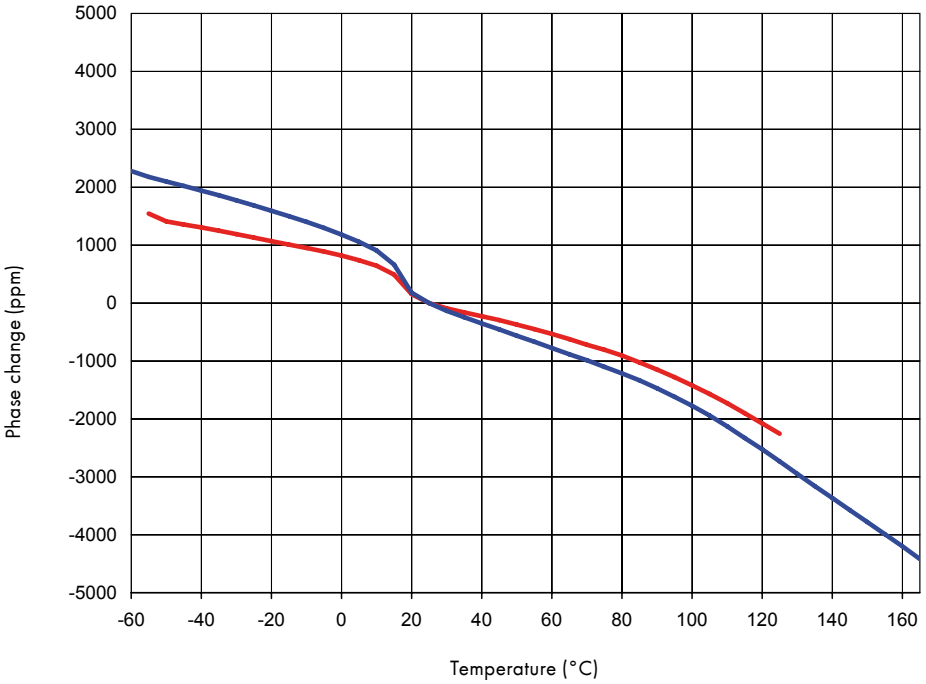
Nominal values @ +25 °C ambient temperature

= MULTIFLEX 53
= MULTIFLEX 86



Phase change vs. temperature

= MULTIFLEX 53
= MULTIFLEX 86

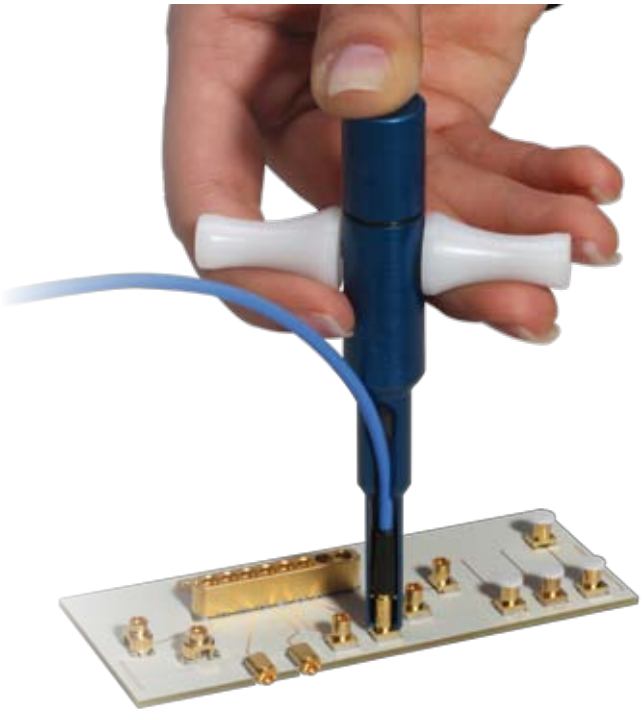


MMPX – Decoupling Tools

«All-round» tool (type description 74_Z-0-0-555)
This decoupling tool is suited for decoupling of each kind of MMPX patterns and combinations.

«PCB» tool (type description 74_Z-0-0-491)
This high-end decoupling tool is especially suited for decoupling of very tight placed MMPX board connectors. It is anodized and electrically non-conductive to prevent short-cutting circuits on the PCB by accident.

Possible combination of patterns
- 11_MMPX / 82_MMPX
- 11_MMPX / 92_MMPX
- 11_MMPX / 96_MMPX
- 16_MMPX / 82_MMPX
- 16_MMPX / 92_MMPX
- 16_MMPX / 96_MMPX



MULTIFLEX 86 - Phase matched Standard Assemblies (+/- 1ps)

HUBER+SUHNER type	Item no.	Operating frequency (GHz)	Connector 1	Connector 2	Assembly length
MMPX - MMPX					
MF86/11MMPX/11MMPX/152 mm	84072076	67	MMPX straight plug (male)	MMPX straight plug (male)	152 mm (6")
MF86/16MMPX/16MMPX/152 mm	84078830	67	MMPX right angle plug (male)	MMPX right angle plug (male)	152 mm (6")
MF86/11MMPX/11MMPX/305 mm	84040208	67	MMPX straight plug (male)	MMPX straight plug (male)	305 mm (12")
MF86/16MMPX/16MMPX/305 mm	84078831	67	MMPX right angle plug (male)	MMPX right angle plug (male)	305 mm (12")
MMPX - PC 1.85 (1.85 mm)					
MF86/16MMPX/11PC1.85/152 mm	84082670	67	MMPX right angle plug (male)	PC 1.85 plug (male)	152 mm (6")
MF86/16MMPX/11PC1.85/305 mm	84086485	67	MMPX right angle plug (male)	PC 1.85 plug (male)	305 mm (12")
MMPX - PC 2.92 [SK] (2.92 mm)					
MF86/11MMPX/11SK/152 mm	84067183	40	MMPX straight plug (male)	PC 2.92 straight plug (male)	152 mm (6")
MF86/11MMPX/21SK/152 mm	84067180	40	MMPX straight plug (male)	PC 2.92 straight jack (female)	152 mm (6")
MF86/16MMPX/11SK/152 mm	84078812	40	MMPX right angle plug (male)	PC 2.92 straight plug (male)	152 mm (6")
MF86/16MMPX/21SK/152 mm	84074084	40	MMPX right angle plug (male)	PC 2.92 straight jack (female)	152 mm (6")
MF86/11MMPX/11SK/305 mm	84067182	40	MMPX straight plug (male)	PC 2.92 straight plug (male)	305 mm (12")
MF86/11MMPX/21SK/305 mm	84078693	40	MMPX straight plug (male)	PC 2.92 straight jack (female)	305 mm (12")
MF86/16MMPX/11SK/305 mm	84078815	40	MMPX right angle plug (male)	PC 2.92 straight plug (male)	305 mm (12")
MF86/16MMPX/21SK/305 mm	84078814	40	MMPX right angle plug (male)	PC 2.92 straight jack (female)	305 mm (12")
MF86/16MMPX/21SK/914 mm	84086484	40	MMPX right angle plug (male)	PC 2.92 straight jack (female)	914 mm (36")
MMPX - SMA					
MF86/11MMPX/11SMA/152 mm	84016478	18	MMPX straight plug (male)	SMA straigth plug (male)	152 mm (6")
MF86/11MMPX/21SMA/152 mm	84079175	18	MMPX straight plug (male)	SMA straigth jack (female)	152 mm (6")
MF86/16MMPX/11SMA/152 mm	84079178	18	MMPX right angle plug (male)	SMA straigth plug (male)	152 mm (6")
MF86/11MMPX/11SMA/305 mm	84079180	18	MMPX straight plug (male)	SMA straigth plug (male)	305 mm (12")

Note: MULTIFLEX 53 phase matched cable assemblies on request.

MMPX Evaluation Kit

Item no. 84122121


Huber+Suhner Series MMPX Pat US 7 294 023

The 40 Gbps Multicoax Solution –
MXP / MULTIFLEX 53 / SUCOFLEX 102 / SUCOFLEX 404

Solution

The HUBER+SUHNER 40 Gbps multicoax solution is based on a triplex approach:

- MXP PCB connector
  - connect your PCB with **maximum density** and **highest performance**
- MULTIFLEX 53 breakout assembly
  - go off the PCB with **maximum flexibility**
- SUCOFLEX 102 / SUCOFLEX 404 cable
  - connect your measurement equipment with **lowest loss**

Features

- Dense MXP connectors allow multicoax connectivity close to the device unter test
- Short MULTIFLEX 53 breakout assemblies provide highest flexibility while still providing low loss
- SUCOFLEX 102 / 404 offers lowest loss interconnectivity to the test equipment
- Quick and reliable interconnection thanks to the Quick Mate coupling nut on the SUCOFLEX 102 / 404 and the ergonomic grip on the MULTIFLEX 53 breakout assembly
- No torque wrench required

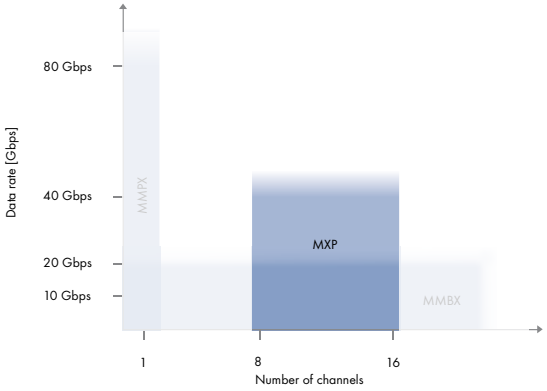
Benefits

- Highest density – lowest loss
- Fast and reliable mating
- Reduces total cost of testing

The 40 Gbps Multicoax Solution

Features

- True 40 Gbps / 40 GHz coaxial-to-PCB transition
- Highest density – lowest loss
- Absolute phase matching down to +/- 2 ps available (MULTIFLEX 53 combined with SUCOFLEX 102 / 404)
- Mechanical robust design
- Extensive technical support
- 3D-files, modelling data and generic footprints available (www.hubersuhner.com/mxp)



Benefits MXP interface

- Quick and reliable push-on mating
- Space saving on PCB
- Shorter traces between device under test and PCB connector
- Easy and secure channel management
- Overall cost savings and service benefits

Benefits MULTIFLEX 53 / SUCOFLEX 102 / 404 cable solutions

- Optimal combination of flexibility (MULTIFLEX 53) and lowest loss (SUCOFLEX 102 / 404)
- Fast and reliable coupling between MULTIFLEX 53 and SUCOFLEX 102 / 404 with the ergo Quick Mate concept

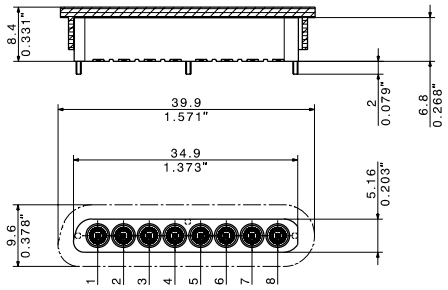
Comprehensive range of standard products (1×8 and 2×8 ganged systems)

- 1×8 and 2×8 straight PCB connectors (SMT)
- 1×8 edge mount connectors and edge mount panel connector
- 2×8 MXP-to-MXP panel adaptor
- 1×8 and 2×8 breakout assemblies MXP to PC 2.92 mm [SK]
- 1×8 and 2×8 jumper assemblies MXP to MXP
- Loop back assemblies
- Standardized SUCOFLEX 102 / 404 assembly lengths with different classes of phase matching

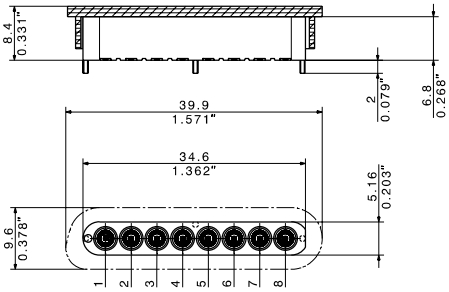
MXP PCB Connectors

- Pitch 4 mm (0.16")
- Via-in-pad capable
- 0.7 mm (0.028") pin size allows easy matching to smallest trace width
- SMD technology – ground pins for better mechanical stability of solder joint

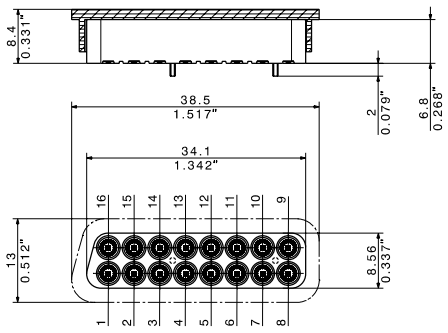
Type 1x8 ganged	Item no.	Packaging	Notes
1x8A_81_MXP-S50-0-1/111_NE	84091435	Tape	Asymmetric design (coded)



Type 1x8 ganged	Item no.	Packaging	Notes
1x8A_81_MXP-S50-0-2/111_NE	84091436	Tape	Symmetric design (non coded)



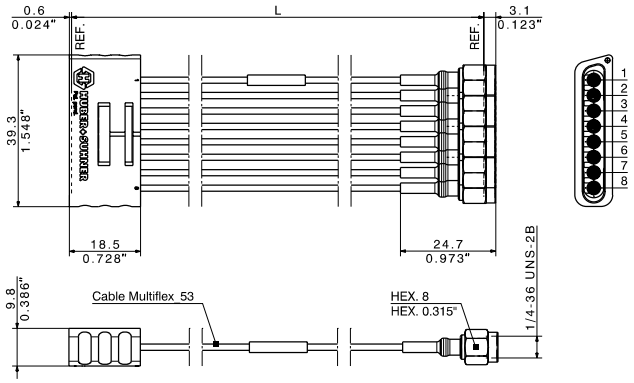
Type 2x8 ganged	Item no.	Packaging	Notes
2x8A_81_MXP-S50-0-1/111_NE	84072058	Tape	Asymmetric design (coded)



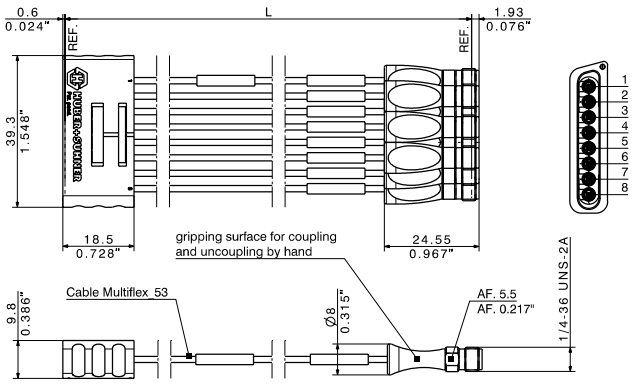
MULTIFLEX 53 Cable Assemblies

- Broad range of standard breakout assemblies MXP-to-PC [SK] (2.92 mm) and jumper assemblies MXP-to-MXP available
- Insertion loss ≤ 2 dB up to 22.5 GHz for a 305 mm (12") assembly
- Customised assemblies on request
- Delivered with thin and high flexible HUBER+SUHNER MULTIFLEX 53 microwave cable (see page 27 for technical data)

Type 1x8 ganged	Item no.	Length	Notes
MF53/1x8A_21MXP/11SK/152	84097196	152 mm (6")	Single channels numbered
MF53/1x8A_21MXP/11SK/229	84099600	229 mm (9")	
MF53/1x8A_21MXP/11SK/305	84099607	305 mm (12")	

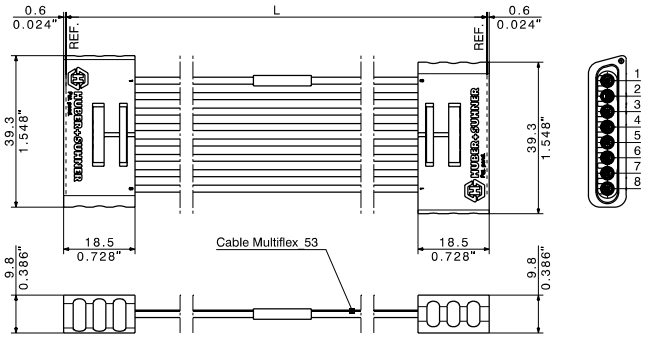


Type 1x8 ganged	Item no.	Length	Notes
MF53/1x8A_21MXP/21SK_ergo/152	84093980	152 mm (6")	Single channels numbered with ergo grip on PC 2.92 side
MF53/1x8A_21MXP/21SK_ergo/229	84098899	229 mm (9")	
MF53/1x8A_21MXP/21SK_ergo/305	84098900	305 mm (12")	

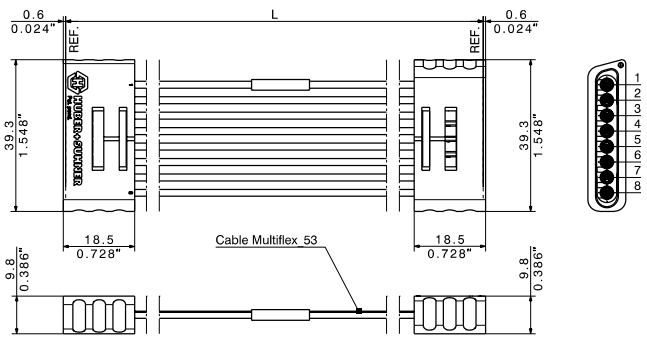


MULTIFLEX 53 Cable Assemblies

Type 1x8 ganged	Item no.	Length	Notes
MF53/1x8A_21MXP/21MXP/305	84099960	305 mm (12")	Pin map: 1 to 8
MF53/1x8A_21MXP/21MXP/610	84100060	610 mm (24")	

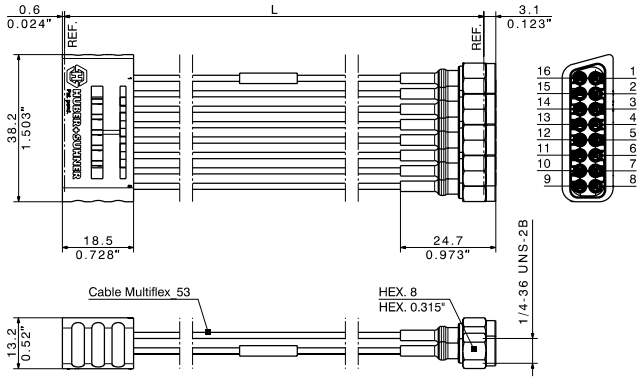


Type 1x8 ganged	Item no.	Length	Notes
MF53/1x8A_21MXP/21MXP/305_1	84099634	305 mm (12")	Pin map: 1 to 1
MF53/1x8A_21MXP/21MXP/610_1	84099914	610 mm (24")	

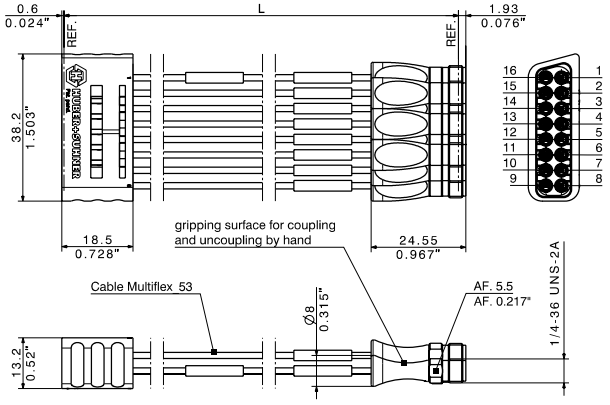


MULTIFLEX 53 Cable Assemblies

Type 2x8 ganged	Item no.	Length	Notes
MF53/2x8A_21MXP/11SK/152	84088950	152 mm (6")	Single channels numbered
MF53/2x8A_21MXP/11SK/229	84098901	229 mm (9")	
MF53/2x8A_21MXP/11SK/305	84088954	305 mm (12")	
MF53/2x8A_21MXP/11SK/610	84089090	610 mm (24")	

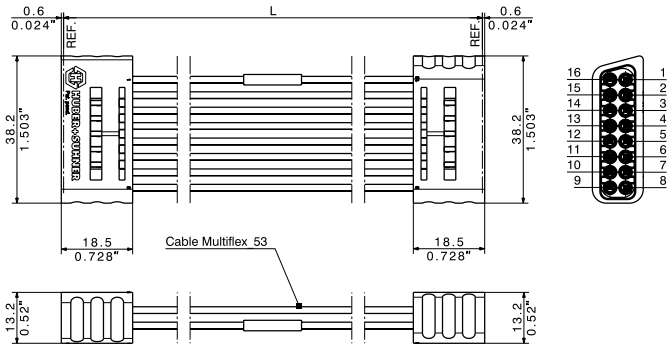


Type 2x8 ganged	Item no.	Length	Notes
MF53/2x8A_21MXP/21SK_ergo/152	84093901	152 mm (6")	Single channels numbered with ergo grip on PC 2.92 side
MF53/2x8A_21MXP/21SK_ergo/229	84098908	229 mm (9")	
MF53/2x8A_21MXP/21SK_ergo/305	84098902	305 mm (12")	

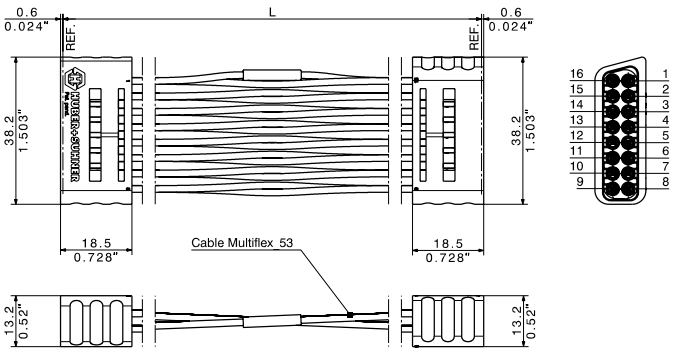


MULTIFLEX 53 Cable Assemblies

Type 2x8 ganged	Item no.	Length	Notes
MF53/2x8A_21MXP/21MXP/305	84099955	305 mm (12“)	Pin map: 1 to 16
MF53/2x8A_21MXP/21MXP/610	84099957	610 mm (24“)	



Type 2x8 ganged	Item no.	Length	Notes
MF53/2x8A_21MXP/21MXP/305_1	84099487	305 mm (12“)	Pin map: 1 to 1
MF53/2x8A_21MXP/21MXP/610_1	84099511	610 mm (24“)	

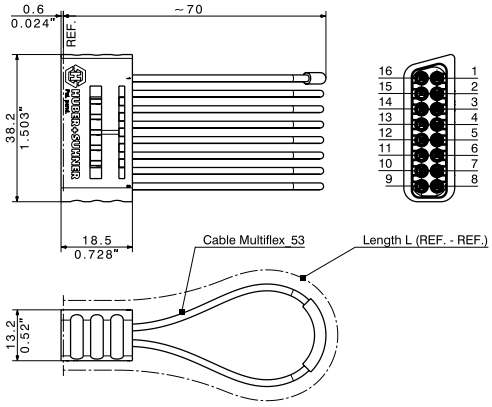


MULTIFLEX 53 Cable Assemblies

Type 2x8 ganged	Item no.	Length	Notes
MF53/2x8A_21MXP/152	84095097	152 mm (6“)	Loop back configuration Pin map: 1 to 16

Typical application

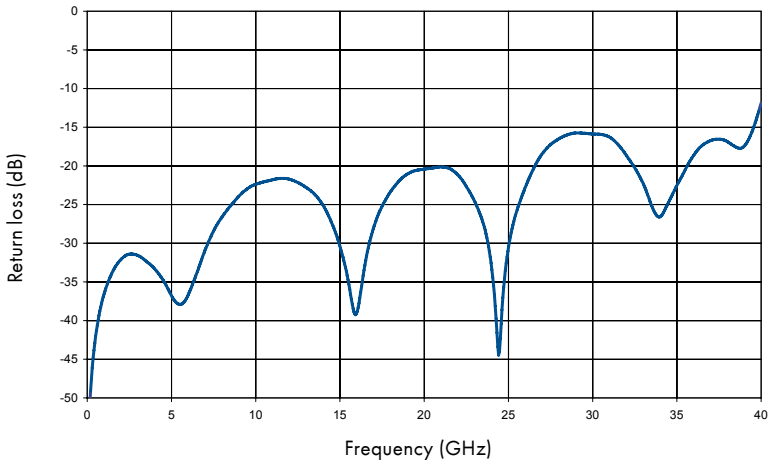
Channel bridging



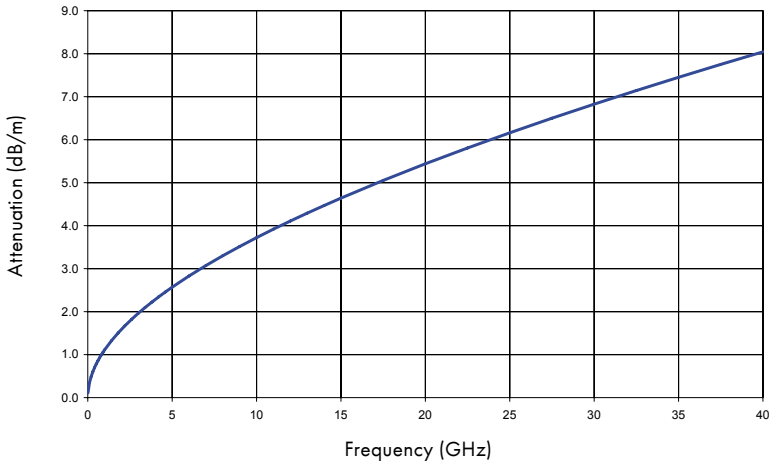
40 Gbps

Technical Data MXP / MULTIFLEX 53

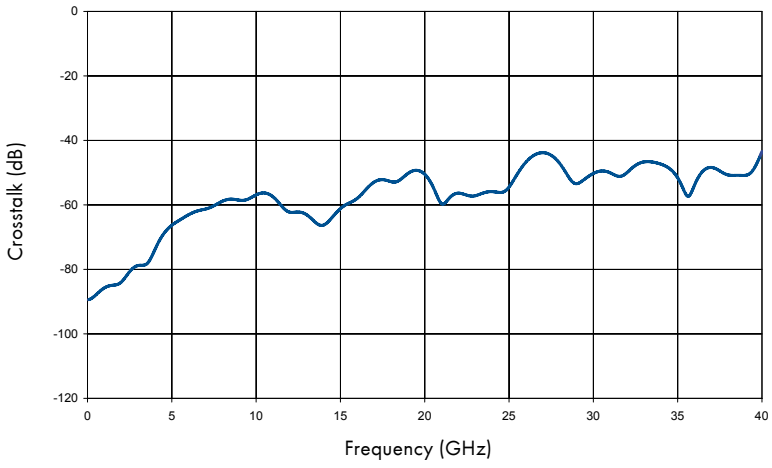
Typical return loss for mated condition (PCB connector with MF53 assembly, gated measurement)



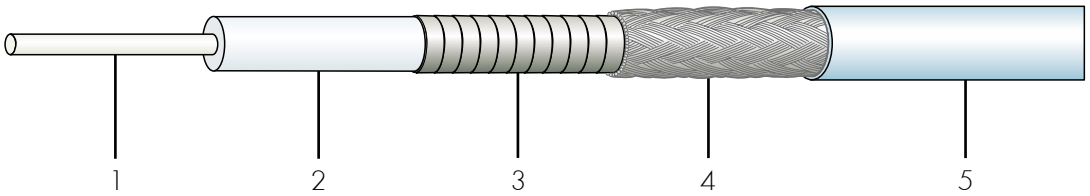
Typical insertion loss for mated condition (PCP connector with MF53 assembly)



Measured cross-talk at PCP transition



SUCOFLEX 102



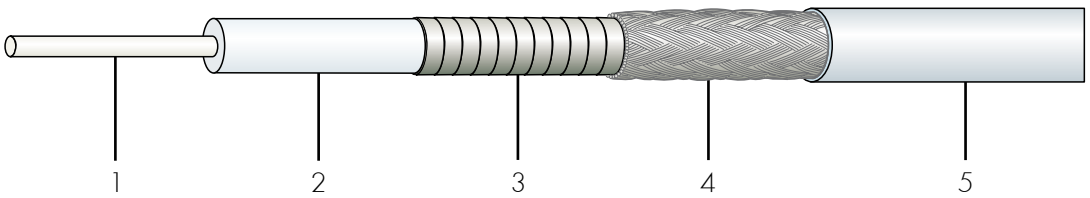
	Description	Diameter
1. Centre conductor	Solid silver-plated copper wire	
2. Dielectric	Low density PTFE	
3. 1st outer conductor	Silver-plated copper tape, wrapped	
4. 2nd outer conductor	Silver-plated copper braid	
5. Jacket	Fluoroethylenepropylene, blue	4.00 mm

Electrical cable data					
Impedance					50 Ohm
Operating frequency					46 GHz
Capacitance					87 pF/m (26.5 pF/ft)
Velocity of propagation					77 %
Time delay					4.3 ns/m (1.31 ns/ft)
Nom. attenuation*	coefficient a	0.3700	coefficient b	0.0071	
Max. attenuation*	coefficient a	0.4070	coefficient b	0.0078	
Max. operating voltage					1.4 kVrms
Min. screening effectiveness up to 18 GHz					90 dB

*Attenuation calculation $\alpha_{25} = a \cdot \sqrt{f}\ (GHz) + b \cdot f\ (GHz)\ (dB/m)$

General cable data	
Temperature range	-55...+125 °C
Weight	4.0 kg/100 m
Min. bending radius static	12 mm

SUCOFLEX 404



	Description	Diameter
1. Centre conductor	Solid silver-plated copper wire	
2. Dielectric	Ultra low density PTFE	
3. 1st outer conductor	Silver-plated copper tape, wrapped	
4. 2nd outer conductor	Silver-plated copper braid	
5. Jacket	Fluoroethylenepropylene, grey	5.50 mm

Electrical cable data					
Impedance					50 Ohm
Operating frequency					26.5 GHz
Capacitance					74.8 pF/m (22.8 pF/ft)
Velocity of propagation					89 %
Time delay					3.74 ns/m (1.14 ns/ft)
Nom. attenuation*	coefficient a	0.2087	coefficient b	0.0053	
Max. attenuation*	coefficient a	0.2120	coefficient b	0.0080	
Max. operating voltage					2.0 kVrms
Min. screening effectiveness up to 18 GHz					90 dB

*Attenuation calculation $\alpha_{25} = a \cdot \sqrt{f}\ (GHz) + b \cdot f\ (GHz)\ (dB/m)$

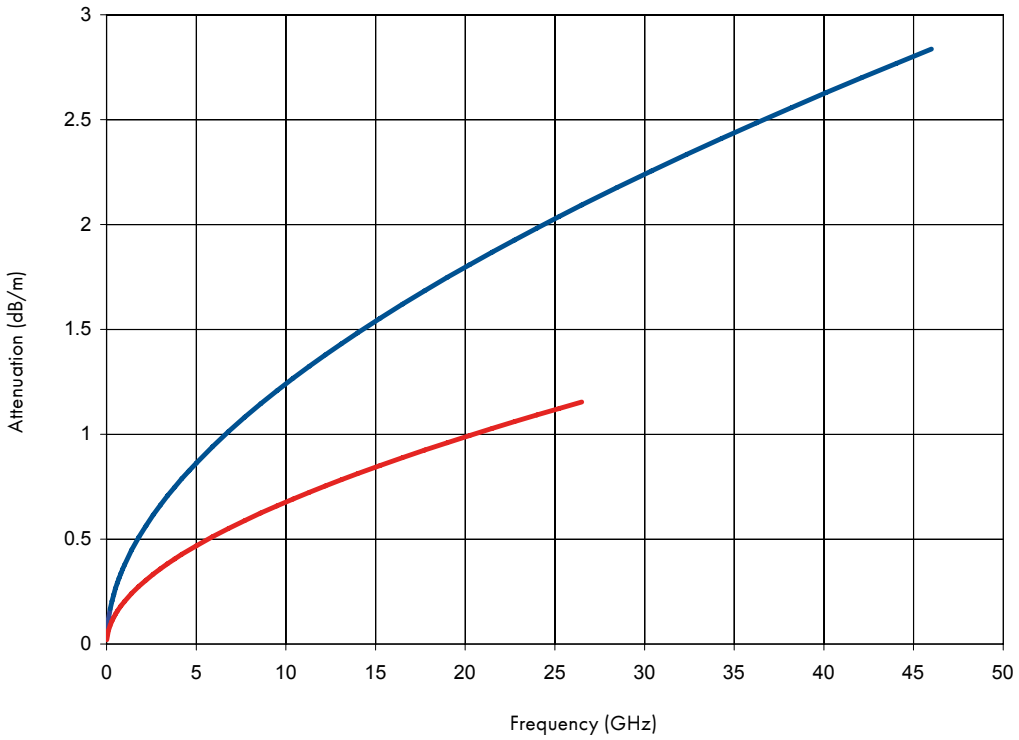
General cable data	
Temperature range	-55...+125 °C
Weight	7.2 kg/100 m
Min. bending radius static	25 mm

SUCOFLEX 102 / 404 – Technical Data

Cable attenuation

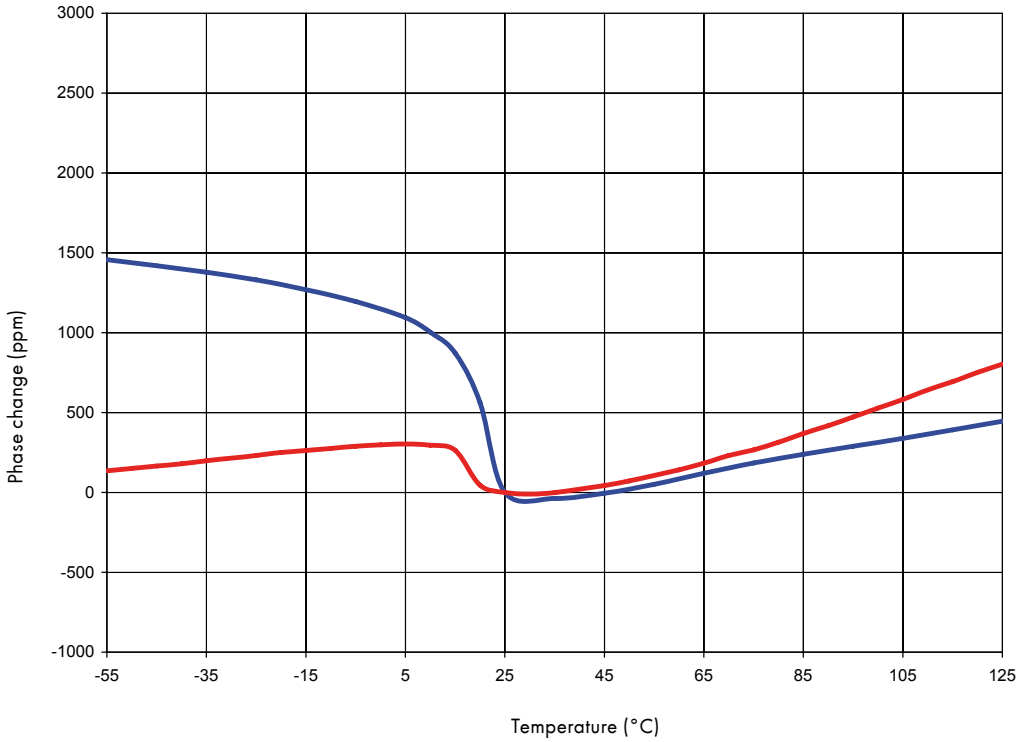
Nominal values @ +25 °C ambient temperature

= SUCOFLEX 102
= SUCOFLEX 404



Phase change vs. temperature

= SUCOFLEX 102
= SUCOFLEX 404



40 Gbps

SUCOFLEX 102 – Optional Ruggedisation

«A» Type for SUCOFLEX 102

Description

Consists of steel coil (flat wire), steel braid and polyurethane (TPU) jacket. Up to +85 °C, this ruggedisation offers excellent protection against compression, tension, torsion, abrasion and other mechanical forces acting upon the cable.

Typical applications

- Test and measurement cables
- Laboratory cables

SUCOFLEX 102 / 404 – Suitable Connectors

Connector	Description	SUCOFLEX 102	SUCOFLEX 102 A	SUCOFLEX 404	Remarks	Operating frequency (GHz)	Return loss[1] (dB)	VSWR
11_PC24_201	PC 2.4 plug (male)	•				46	-20	1.2
21_PC24_201	PC 2.4 jack (female)	•				46	-20	1.2
11_PC24_210	PC 2.4 plug (male)		•			46	-20	1.2
21_PC24_210	PC 2.4 jack (female)		•			46	-20	1.2
11_SK_252	SK 2.92 [SK] plug (male)	•				40	-20	1.2
21_SK_252	SK 2.92 [SK] jack (female)	•				40	-20	1.2
11_SK_258	SK 2.92 [SK] plug (male)		•			40	-20	1.2
21_SK_257	SK 2.92 [SK] jack (female)		•			40	-20	1.2
11_PC35_203	PC 3.5 plug (male)	•				26.5	-20	1.2
21_PC35_203	PC 3.5 jack (female)	•				26.5	-20	1.2
11_PC35-407	PC 3.5 plug (male)			•		18 26.5	-26 -24	1.106 1.135
21_PC35-407	PC 3.5 jack (female)			•		18 26.5	-26 -24	1.106 1.135
11_PC35-410	PC 3.5 plug (male)			•	Quick Mate concept	18 26.5	-26 -24	1.106 1.135
11_SMA-401	SMA plug (male)			•		18	-25	1.12
16_SMA-465	SMA plug (male)			•		18	-22	1.163
11_N-431	N plug (male)			•	MIL	18	-25	1.12

1) VSWR per connector at operating frequency

Connector patterns

11 Straight cable plug (male)

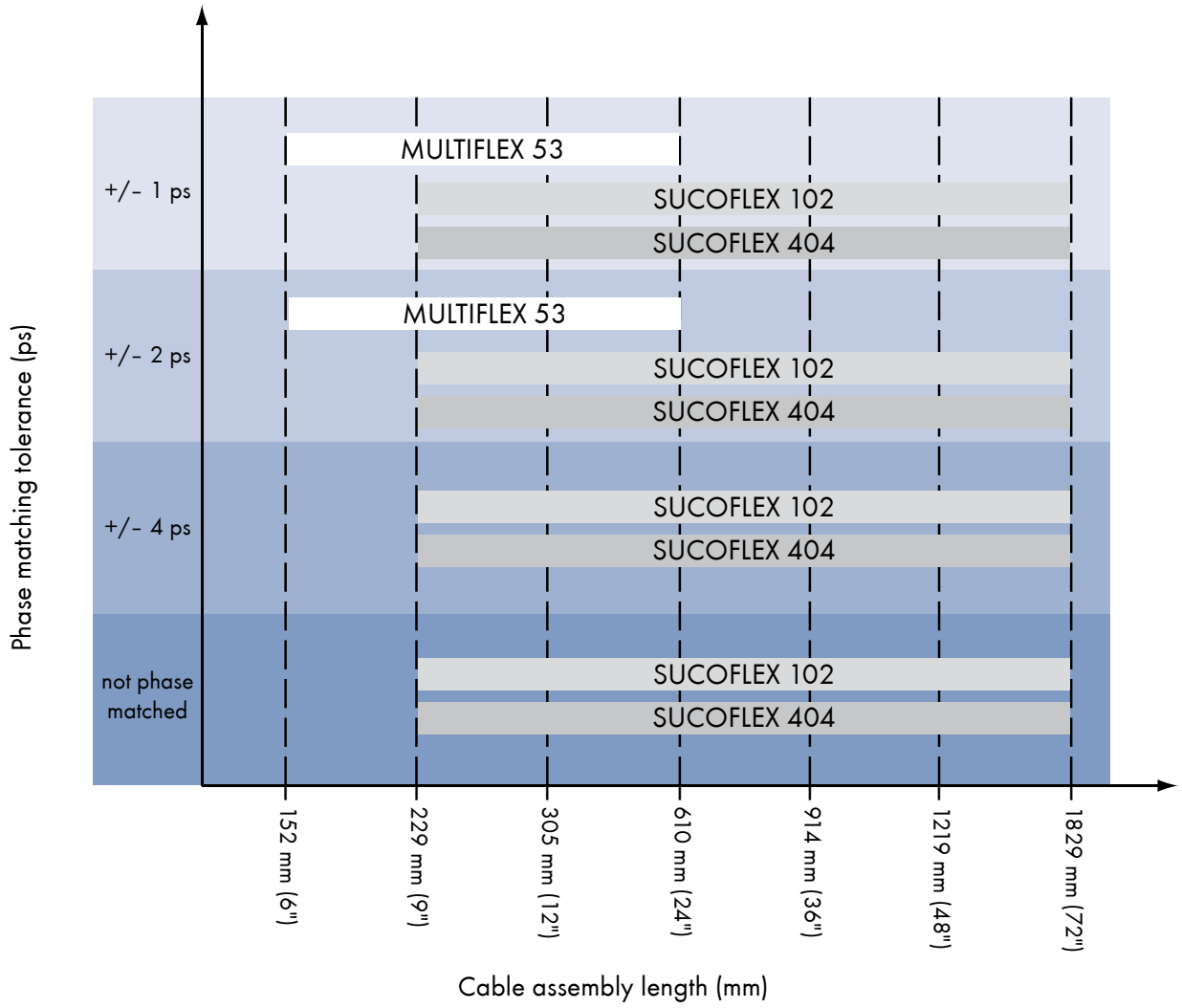
16 Right angle cable plug (male)

21 Straight cable plug (female)

MULTIFLEX 53 / SUCOFLEX 102 / SUCOFLEX 404

Phase matched Standard Assemblies

HUBER+SUHNER is offering a comprehensive range of phase matched standard assemblies for the MULTIFLEX 53, SUCOFLEX 102 and SUCOFLEX 404 cables.



Your HUBER+SUHNER representative can provide you detailed information.

MXP Evaluation Kit

Set includes

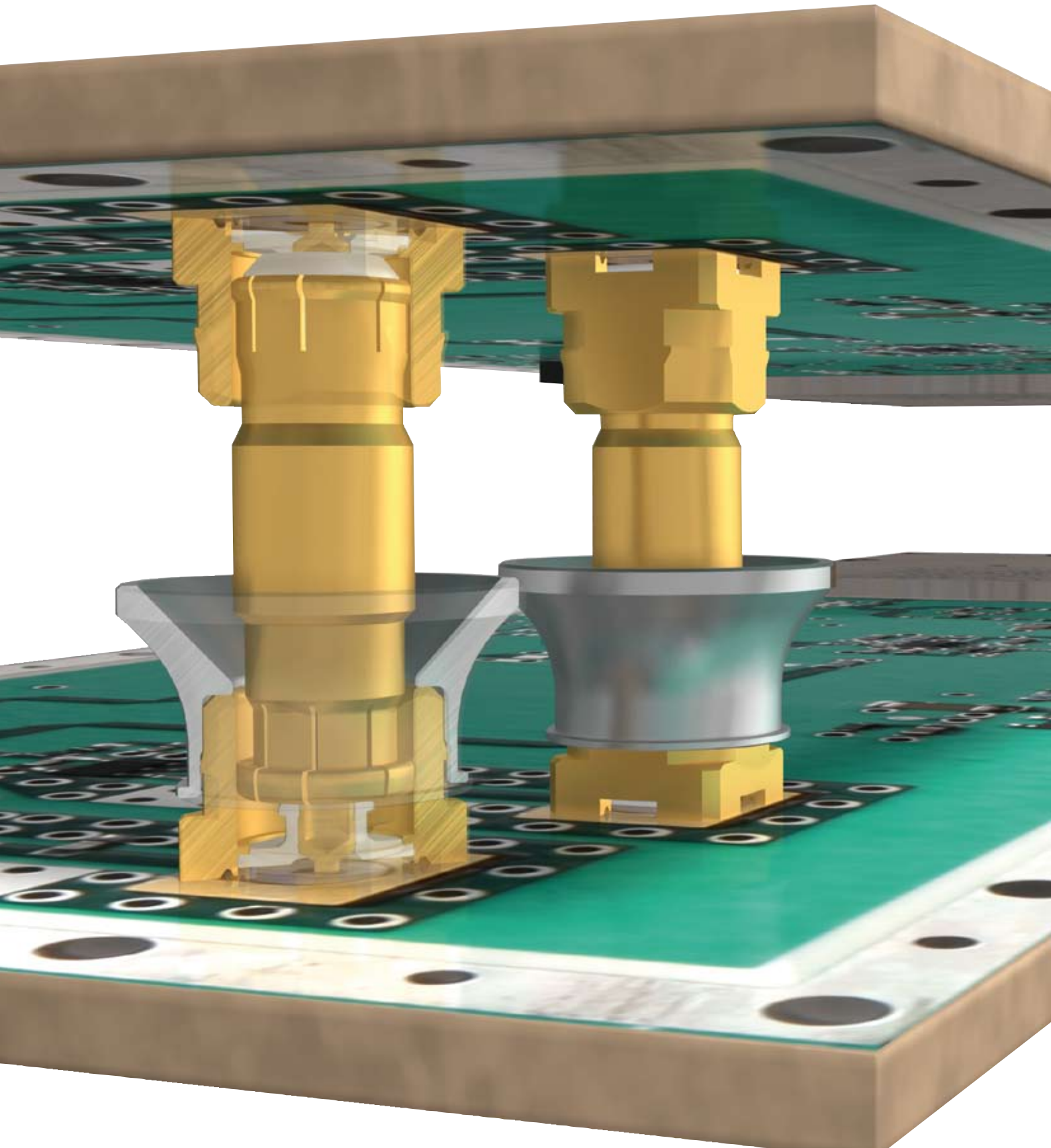
Assembly
- MXP breakout assembly to PC 2.92 [SK] 152 mm (12")
- Cable: HUBER+SUHNER MULTIFLEX 53

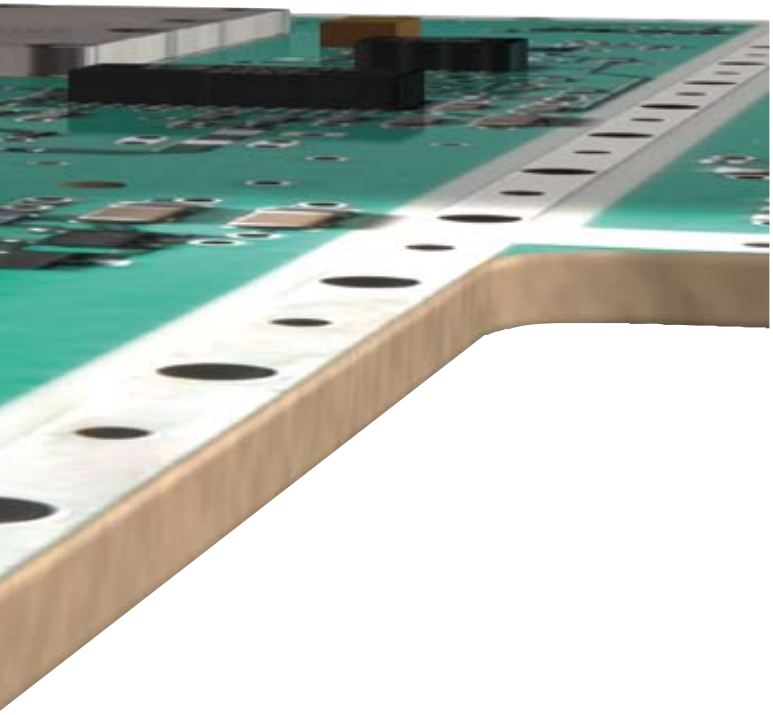
PCB
- MXP PCB connector
- Fan-out to MMPX* (adapters to PC 2.92 [SK] included)
- OST calibration area
- Material: Rogers RO3003
- Substrate thickness: 0.127 mm (5 mil)
- Dielectric constant ε_r: 3
- Stack-up: microstrip

*) HUBER+SUHNER MMPX - 67 GHz precision snap connectors (patented) see page 10

Item no. 84114135

The 20 Gbps Multicoax Board-to-Board Solution – MMBX





Features

- Direct board-to-board connection
- Compensating mechanical misalignment in axial (up to ± 0.3 mm) and radial direction
- No mechanical stress on piece parts or solder joints
- Blind mateable
- Excellent RF performance
- Good power handling

Benefits

- Lower total cost of ownership
  Thanks to the distinguished axial float (± 0.3 mm) more complex board-to-board structures are possible (tolerance chain). Module housings and other parts no longer need to be so precisely machined.

- Miniaturization
  The design of more compact modules (transceivers, remote radio units) are possible with board-to-board distances as low as 6.7 mm. This enables designs of smaller modules with less weight and lower cost.

- High output power
  The MMBX connectors can handle high power requirements in a module environment where high ambient temperatures are given. This opens new possibilities for module designs without active cooling but high output power.

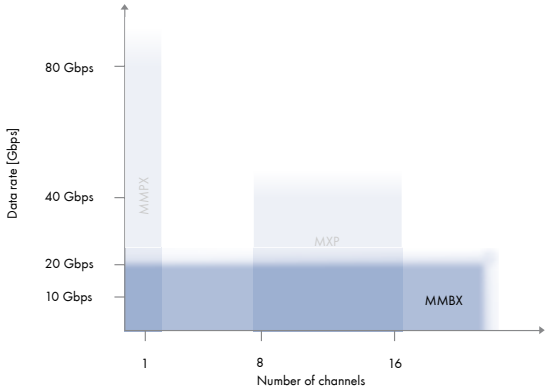
- Reliable connection
  The MMBX design is such that no mechanical stress applies to the piece parts and solder joints and therefore ensures high reliability.

- Secure mating and assembling process:
  The MMBX allow direct blind mateable board-to-board connections.

MMBX – Design Guideline

Working range (axial and radial)

In mated condition, the two connecting parts have to be aligned within the dimension given for the axial and radial working range.
The axial working range in the example below is 8 mm ± 0.3 mm, the radial working range is ± 0.4 mm.
The tolerance for the axial working range depends on the interface (MMBX ± 0.3 mm). The radial working range depends on the length of the adapter: the longer the adapter the higher the radial working range.



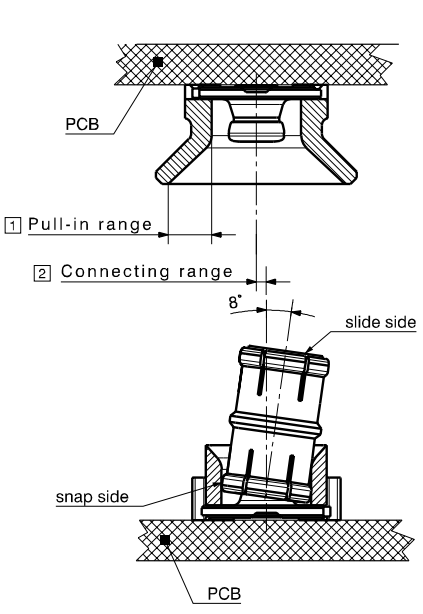
Connecting range

The two connecting parts need to be aligned within the connecting range when mating. In order to guarantee a blind mateable connection, the tilted adapter will be guided by the funnel of the opposite connector.
The connecting range therefore depends on the length of the adapter and the pull-in range (size of the funnel). The connecting range in the example is ± 0.8 mm for a pull-in range of 1.8 mm. If the funnel (pull-in range) is smaller than 0.95 mm, a blind mateable assembly process is not possible anymore.
In the case where the connecting range and radial working range are different, the smaller value has to be considered for the alignment of the boards.

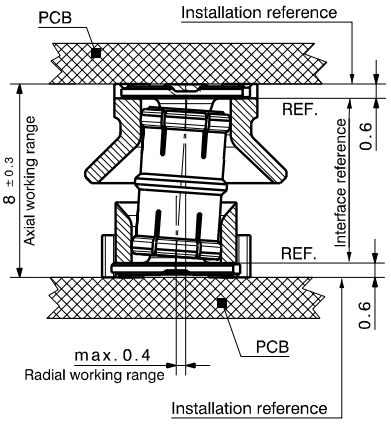
Recommendation

HUBER+SUHNER recommend using guiding pins to align the boards within the connecting range and working range and also distance holders to maintain the axial misalignment within the working range.
HUBER+SUHNER provide an outline drawing for every application with the relevant mechanical dimensions that need to be considered when designing-in MMBX. 3-D STEP files are available on www.hubersuhner.com.

Connecting range



Working range



Pull-in range on PCB connector 1	Connecting range 2	PCB connector with mentioned pull-in range (for example)
1.8	max. 0.8	82_MMBX-S50-0-13
0.95	max. 0.15	82_MMBX-S50-0-3
0.65	not possible	82_MMBX-S50-0-1

Technical Data of MMBX PCB Connectors – Board-to-Board

Electrical data	Requirements		
Impedance	50 Ω		
Frequency range	DC ... 12.4 GHz		
Dielectric withstanding voltage (at sea level)	1 kV rms, 50 Hz		
Working voltage (at sea level)	≤ 330 V rms, 50 Hz		
Insulation resistance	≥ 1 GΩ		
Contact resistance - centre contact - outer contact	 ≤ 5 mΩ ≤ 1 mΩ		
Return loss	typical values for a board-to-board connection		
	board-to-board distance	DC ... 2.5 GHz	2.5 ... 6 GHz
	6.7 mm 11.65 mm 20.0 mm	26 dB 26 dB 26 dB	25 dB 19 dB 19 dB
RF-leakage (interface only)	≥ 70 dB (DC ... 6 GHz) ≥ 60 dB (6 GHz ... 12.4 GHz)		
Power	typical 260 W at 2.4 GHz at room temperature		

Mechanical data	Requirements
Engagement force (slide-side)	≤ 15 N / 3.4 lbs
Disengagement force (slide-side)	≤ 15 N / 3.4 lbs
Durability (matings)	100
Axial float (misalignment)	± 0.3 mm
Radial float (misalignment)	depending on the adapter length ± 0.4 mm (at 6.7 mm board-to-board distance) ± 0.8 mm (at 11.65 mm board-to-board distance)

Environmental data	Test conditions
Temperature range	- 55 °C ... + 155 °C / - 67 °F ... + 311 °F
Climatic category	55 / 155 / 21
Thermal shock	MIL-STD-202, Method 107 G, Condition B1
Moisture resistance	MIL-STD-202, Method 106 F
Corrosion	MIL-STD-202, Method 101, Condition B
Vibration	MIL-STD-202, Method 204 D, Condition A

Processing data	Requirements
Adherent to the print - shearing - pulling (vertical to PCB)	 ≥ 150 N / 33.7 lbs. ≥ 150 N / 33.7 lbs.

Material data		
Connector parts	Material	Plating
Centre contact	brass / bronze / copper-beryllium alloy	SUCOPRO
Outer contact	brass / bronze	SUCOPRO
Body	brass	SUCOPRO
Insulators	LCP / PTFE / PFA	

MMBX PCB Connectors

Straight PCB jacks (female)

- Surface mount type SMT

HUBER+SUHNER type	Item no.	Packaging	Notes	Fig.
82_MMBX-S50-0-15/111_NE	84120607	single	pull-in range 0.65 mm / 0.0256 in.	1
82_MMBX-S50-0-15/111_NH	84002089	bulk 100 pcs.	pull-in range 0.65 mm / 0.0256 in.	1
82_MMBX-S50-0-15/111_NM	84018367	tape and reel	pull-in range 0.65 mm / 0.0256 in.	1
82_MMBX-S50-0-20/111_NE	84120616	single	pull-in range 1.80 mm / 0.0709 in.	2
82_MMBX-S50-0-20/111_NH	84122198	bulk 100 pcs.	pull-in range 1.80 mm / 0.0709 in.	2
82_MMBX-S50-0-20/111_NM	84047799	tape and reel	pull-in range 1.80 mm / 0.0709 in.	2

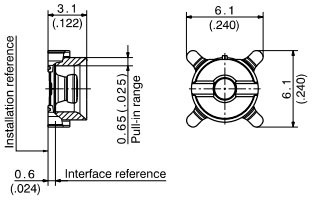
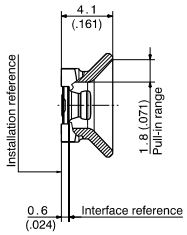


Fig. 1



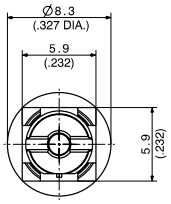


Fig. 2

Straight PCB plugs (male)

- Surface mount type SMT

HUBER+SUHNER type	Item no.	Packaging	Notes	Fig.
81_MMBX-S50-0-18/111_NE	84122199	single		3
81_MMBX-S50-0-18/111_NH	84122200	bulk 100 pcs.		3
81_MMBX-S50-0-18/111_NM	84075488	tape and reel		3

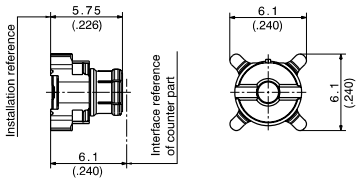


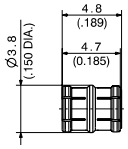
Fig. 3

MMBX Adaptors within Series

Straight adaptors

- Plug to plug (male)

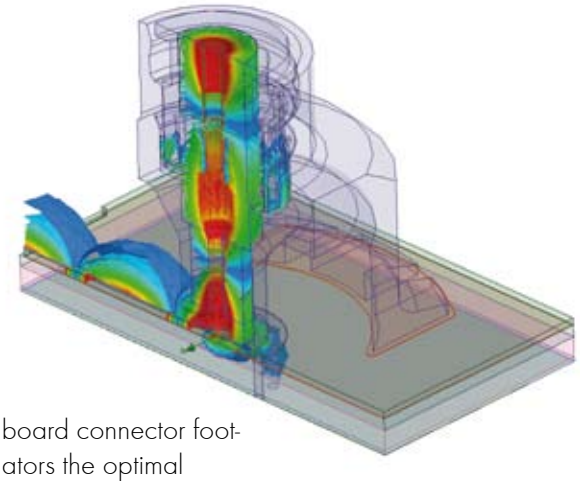
HUBER+SUHNER type	Item no.	Packaging	Board-to-board distance	Adaptor length X	Min. pull-in range
32_MMBX-50-0-1/111_NE	23001749	single	6.7 mm/.264 in.	4.7 mm/.158 in.	0.65 mm/.026 in.
32_MMBX-50-0-1/111_NY	84028418	industrial 200 pcs.	6.7 mm/.264 in.	4.7 mm/.158 in.	0.65 mm/.026 in.
32_MMBX-50-0-12/111_NH	84004734	bulk 100 pcs.	8.0 mm/.315 in.	6.0 mm/.236 in.	0.95 mm/.037 in.
32_MMBX-50-0-4/111_NE	23010564	single	10.0 mm/.394 in.	8.0 mm/.315 in.	1.80 mm/.071 in.
32_MMBX-50-0-4/111_NY	23038658	industrial 300 pcs.	10.0 mm/.394 in.	8.0 mm/.315 in.	1.80 mm/.071 in.
32_MMBX-50-0-13/111_NE	84031096	single	12.0 mm/.472 in.	10.0 mm/.417 in.	1.80 mm/.071 in.
32_MMBX-50-0-5/111_NE	84026915	single	14.0 mm/.551 in.	12.0 mm/.472 in.	1.80 mm/.071 in.
32_MMBX-50-0-5/111_NY	23011920	industrial 200 pcs.	14.0 mm/.551 in.	12.0 mm/.472 in.	1.80 mm/.071 in.
32_MMBX-50-0-10/111_NY	23034946	industrial 200 pcs.	15.0 mm/.591 in.	13.0 mm/.512 in.	1.80 mm/.071 in.



MMBX Evaluation Kit

Item no. 84122122

Service and Support



Customized and optimized PCB footprints

HUBER+SUHNER is offering a professional design-in service for board connector footprints. By the use of three dimensional electromagnetic field simulators the optimal performance of the HUBER+SUHNER board connectors is provided to the customer. The HUBER+SUHNER Customer Footprint Optimization Process is shown on the next page.

Comprehensive design data

HUBER+SUHNER provides comprehensive design data collections to their customers:

3-D Files

For the exchange of CAD models between various CAD systems, HUBER+SUHNER is providing 3-D files in IGS or STEP data format.

S-parameter files

Measured S-parameters of the HUBER+SUHNER components are available on request, offering the customers the possibility to include these components into their electrical simulations.

Application notes

A bunch of application notes and technical design guidelines for the HUBER+SUHNER solutions are available on request.

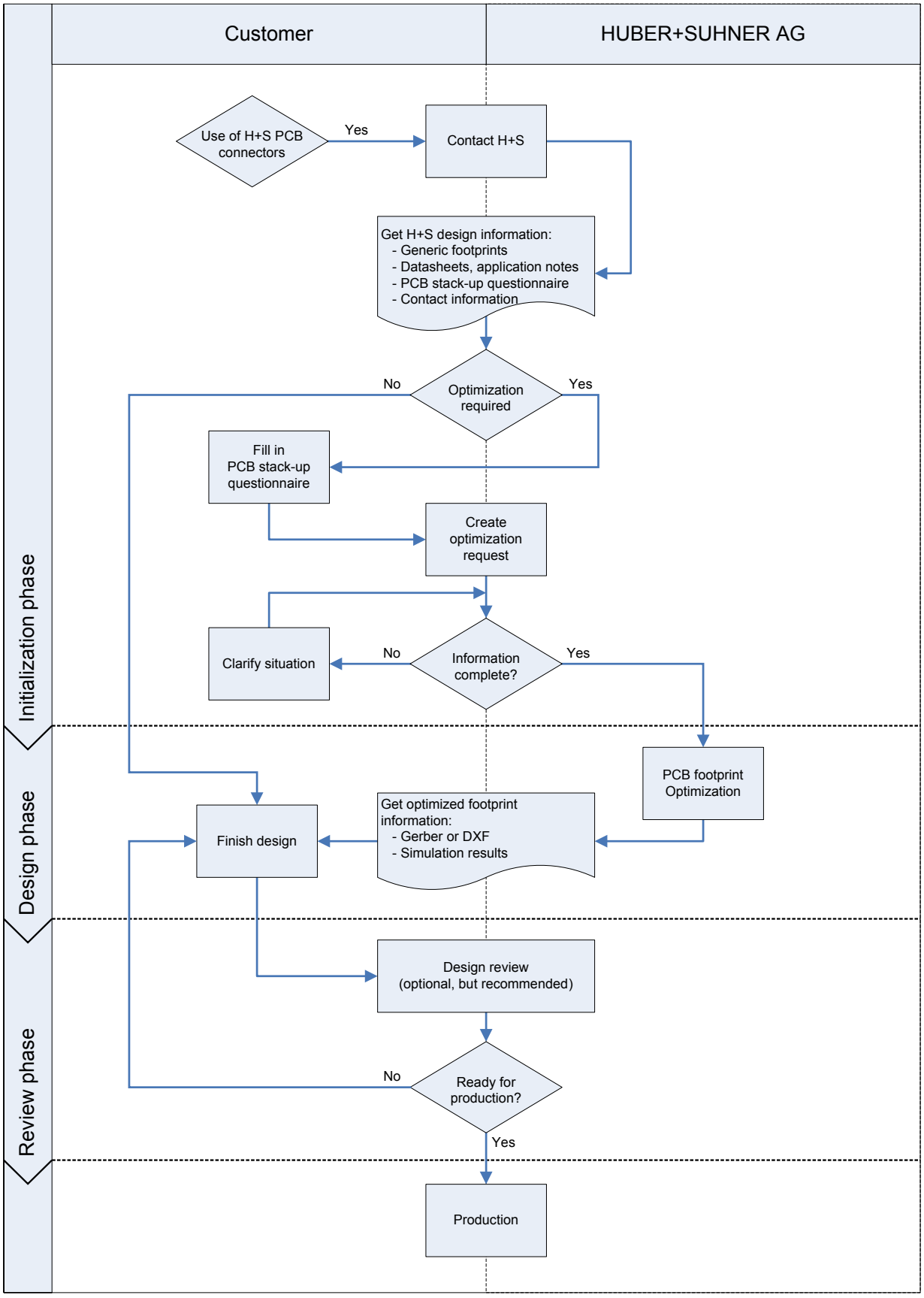
Non standard connectors

Although our standard assortment is broad and miscellaneous, there are customer requirements which need a special solution. Thanks to capabilities and years of experience, HUBER+SUHNER is the ideal partner when customized solutions are demanded.

Repair Service

HUBER+SUHNER is offering a retermination service for the professional replacement of defective channels. Your HUBER+SUHNER representative will guide you if you are in need of a repair and want to benefit from this opportunity.

HUBER+SUHNER Customer Footprint Optimization Process



Further HUBER+SUHNER Products

Connector series

For several reasons, only the most popular HUBER+SUHNER connector series and the appropriate connector regarding High Speed Digital Testing are mentioned in this brochure. Connector series such as SMA, PC 3.5 etc. belong also to the broad product range of HUBER+SUHNER and are listed below.

Series	Coupling mechanism	Frequency range	
MMCX	snap-on	6 GHz	
MCX	snap-on	6 GHz	
SMC	screw-on	10 GHz	
SMPX	snap-on	40 GHz	
PC 1.85 (1.85 mm)	screw-on	67 GHz	
PC 2.4 (2.4 mm)	screw-on	50 GHz	
PC 2.92 [SK] (2.92 mm)	screw-on	40 GHz	
PC 3.5 (3.5 mm)	screw-on	26.5 GHz	
SMA	screw-on	18 GHz	
QMA	quick-lock	18 GHz	
N	screw-on	11 GHz	
QN	quick-lock	11 GHz	

SEMI-RIGID – the form-stable Microwave Cable

Product description

The semi-rigid cable is unique in that it is easily bent to finished shape and still maintains its set after bending. This property makes it ideal for use with automated bending equipment as well as hand forming by bending tools. There are hundreds of proven applications which include: low-noise amplifiers, a full range of microwave components, aeronautical and space applications and a variety of high-performance laboratory instrumentation. The semi-rigid cables provide greatly extended environmental parameters. The cables exhibit highly favourable electrical characteristics, particularly an impedance tolerance as low as 0.5 Ohm for a .141" diameter cable with nominal impedance of 50 Ohm.

Features and benefits

- Excellent electrical performance: impedance tolerance as low as 0.5 Ohm; minimum VSWR, smooth attenuation vs. frequency curve; minimum change in impedance and attenuation
- Easy to form, strip and solder, making for convenient installation
- Small sizes permit use in high-density areas
- MIL-C-17 qualified

HUBER+SUHNER cable type	Item no.	Operating frequency (GHz)	Temperature range minimum (°C)	Temperature range maximum (°C)	Outer dia. (mm)	Nom. attenuation 18 GHz, 25°C (dB/m)	Bending radii static (mm)	Bending radii dyn. (mm)
STORM_SR_86_TP	84016454	75	-40	+125	2.18	2.9	6.35	n/a
EZ_47_TP_M17	22810504	40	-40	+100	1.19	5.1	3.18	n/a
EZ_47_AL_TP	22810510	40	-40	+100	1.19	5.4	1.27	n/a
EZ_86_TP_M17	22810175	40	-40	+125	2.20	3.2	3.18	n/a
EZ_86_AL_TP_M17	22810167	40	-40	+125	2.20	3.3	1.78	n/a
EZ_118_TP	22810073	40	-40	+125	2.95	1.8	9.53	n/a
EZ_141_TP_M17	22810043	33	-40	+125	3.58	2.1	6.35	n/a
EZ_141_AL_TP_M17	22810015	33	-40	+125	3.58	2.2	3.18	n/a
EZ_250_TP_M17	22810705	18	-40	+90	6.35	1.5	9.52	n/a
EZ_250_AL_TP	22810708	18	-40	+90	6.35	1.5	6.35	n/a

SUCOFORM – the handformable Alternative to SEMI-RIGID

Product description

SUCOFORM microwave coaxial cables offer distinct mechanical advantages over semi-rigid cables. They are based on the same design as the standard PTFE-insulated semi-rigid cables, but have a tin-soaked copper braid for the outer conductor, giving them outstanding hand-formability. These cables combine the excellent characteristics of semi-rigid cables with those of flexible coaxial cables.
Thanks to their small bending radii, they allow space-saving routing and packaging.

Features and benefits

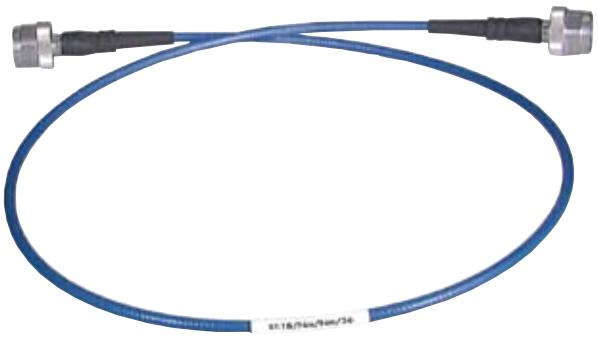
- Excellent properties: low loss, high screening effectiveness, high operating frequency, high temperature range
- Due to the high phase stability over every production run, SUCOFORM is especially suitable for delay lines
- Good flexibility: easy hand forming without tooling; fits into the smallest systems
- Comprehensive connector range; use of standard semi-rigid connectors
- Quick and easy assembly
- Available in long lengths and various versions

HUBER+SUHNER cable type	Operating frequency (GHz)	Temperature range minimum (°C)	Temperature range maximum (°C)	Outer dia. (mm)	Nominal attenuation 18 GHz, 25 °C (dB/m)	Bending radii static (mm)	Bending radii repeat. (mm)
SUCOFORM_47_CU	40	-65	+165	1.20	5.4	3.18	-
SUCOFORM_86	40	-65	+165	2.10	3.4	6	20
SUCOFORM_141	33	-65	+165	3.58	2.2	8	40
SUCOFORM_141_CU	33	-65	+165	3.58	2.2	8	40
SUCOFORM_250-01	18	-65	+165	6.35	1.4	30	120

SUCOTEST 18 – for the highest Standard of Measurement

Product description

SUCOTEST 18 cable assemblies feature excellent electrical performance (low insertion loss combined with unique loss stabilitiy and excellent return loss).
SUCOTEST 18 is ideal for daily use in components and assembly shops, test labs and automatic test equipment applications.



Product assortment

	Item no.
SUCOTEST_18/SMAm/SMAm/36"	84002061
SUCOTEST_18/Nm/Nm/36"	84002060
SUCOTEST_18/SMAm/Nm/36"	84004594
SUCOTEST_18/SMAm/SMAm/48"	84003373
SUCOTEST_18/Nm/Nm/48"	84003372
SUCOTEST_18/SMAm/Nm/48"	84004006
SUCOTEST_18/SMAm/SMAm/72"	84004007
SUCOTEST_18/Nm/Nm/72"	84004070
SUCOTEST_18/SMAm/Nm/72"	84004595

Outstanding Features

- Applicable up to 18 GHz
- Low insertion loss
- Excellent VSWR
- Unique loss stability
- There is no cable spring back during measurement procedures; the assembly stays in position.

SUCOFLEX® 100 – the high Performance Microwave Cable Assembly

Product description

SUCOFLEX 100 series flexible microwave cable assemblies offer superior electrical and mechanical performance for static and dynamic applications.
This series is a high-end product designed to provide optimal performance up to 50 GHz, where stringent electrical requirements – in particular stability and low loss – are important. Their mechanical and climate resistance properties surpass those of standard flexible cables.
This cable type is ideally suited to test and measurement applications (as test leads) and used in aerospace and defence systems.

Features and benefits

- The cable maintains stable electrical characteristics when exposed to bending and temperature, enabling reliable test results
- A balanced range of connectors is available, including types which feature NWA-specific interfaces
- Can be provided with various ruggedisations to protect the assembly against different environmental influences
- Available as assembly only

HUBER+SUHNER cable type	Operating frequency (GHz)	Temperature range minimum (°C)	Temperature range maximum (°C)	Outer dia. (mm)	Nominal attenuation 18 GHz, 25°C (dB/m)	Bending radii static (mm)	Bending radii dyn. (mm)
SUCOFLEX_101	50	-55	+125	3.65	2.0	11	20
SUCOFLEX_101_P	50	-55	+125	3.65	3.0	11	20
SUCOFLEX_101_PE	50	-40	+85	3.65	3.0	11	20
SUCOFLEX_102	46	-55	+125	4.00	1.7	12	20
SUCOFLEX_103	33	-55	+125	4.60	1.3	13	22
SUCOFLEX_104	26.5	-55	+125	5.50	1.1	16	25
SUCOFLEX_104_P	26.5	-55	+125	5.50	1.6	16	25
SUCOFLEX_104_PE	26.5	-40	+85	5.50	1.6	16	25
SUCOFLEX_106	18	-55	+125	7.90	0.8	24	40
SUCOFLEX_106_P	18	-55	+125	7.90	1.3	24	40


SUCOFLEX 100

Related HUBER+SUHNER Products

Standard and precision adapters

		MMBX		MMCX		MCX		SMPX		PC 1.85	
		Plug	Jack	Plug	Jack	Plug	Jack	Plug	Jack	Plug	Jack
MMCX	Plug			84047711							
	Jack				22645960						
MCX	Plug					22653002					
	Jack	84014432[1]					22543558				
MMPX	Plug										84004922
	Jack									84004935	
SMPX	Plug							23021824			
	Jack										
PC 1.85	Plug										84019546
	Jack									84019546	
PC 2.4	Plug										
	Jack										
PC 2.92	Plug										
	Jack										
PC 3.5	Plug										
	Jack										
SMA	Plug	23004934	23004935	22645967	22645969	22645486	22645488				
	Jack	23004937	23004933 84008370[6]	22645970	22645961 22658868[6]	22645487	22645485				
QMA	Plug										
	Jack		84076178[6]								
N	Plug					22543584 22651490[2]	22543796 22649214[2]				
	Jack		84027355[6] 84007990[7]			22543586 22649216[2]	22640172 22646217[6]				
QN	Plug										
	Jack		84037845 [3] and [6]								

00000000 Standard adapters

00000000 Precision adapters for test+measurement high speed digital testing solutions applications

1) NH = 100 pieces

2) 75 Ω

3) NY = variable industrial packing

4) Additional type item no. 23021818

APPENDIX

PC 2.92 [SK]		PC 3.5		SMA		QMA		N			
Plug	Jack	Plug	Jack	Plug	Jack	Plug	Jack	Plug	Jack		
				22658202	22658203					Plug	MMCX
				22658204	22658201					Jack	
		22651600	22651594							Plug	MCX
		22651599	22651593							Jack	
	84071648									Plug	MMPX
84071696										Jack	
	23032847									Plug	SMPX
23021753 23021792	23021816 23021817[4]									Jack	
										Plug	PC 1.85
										Jack	
23004729	23004730								22650021	Plug	PC 2.4
23004731	84008075							22649932		Jack	
23004727	23004728									Plug	PC 2.92
23004728	23004726									Jack	
	84057235[7]										
		22644361	22644362			23017489	23017467	22643957	22643958 22660363[7]	Plug	PC 3.5
		22644362	22644360			23017488	23017468	22643959	22643960	Jack	
				22648730	22648731			22543916	22660181	Plug	SMA
				22640151	22641119						
				22648731	22648729			22660180 22543925	22660178 22645162[7]	Jack	
				22641119	22640150						
					84014876 23022741[7]	23023199	23023287		23023143	Plug	QMA
							84034347[7]				
				84012204		23023287	23023171	23024265		Jack	
						84034347[7]	84012029[6]				
				22542399	22652905 23038869[7]			22652113	22652114	Plug	N
								22542398	23014355		
				22640154 22660211[5]	22542386 22642820[6]			22652114	22652112	Jack	
								23014355	22542382		
			23033936		84018915				23036033	Plug	QN
									84016830 23040535[6]	Jack	

00000000 Standard adapters

00000000 Precision adapters for test+measurement high speed digital testing solutions applications

5) Quick-Mate

6) Bulkhead adapter

7) Panel adapter, flange mount

APPENDIX

Resistive Components

Product range low power attenuators

Power	0.5 to 2 Watts
Connectors 50 Ω	BNC, N, PC 2.4, PC 2.92, PC 7, QN, QMA, SMA, SMPX, TNC
Connectors 75 Ω	BNC, N
Frequency range	from DC up to 50 GHz
Attenuation range	0 to 40 dB

Product range low power terminations

Power	0.5 to 2 Watts
Connectors 50 Ω	TNC, SMPX, SMB, SMC, SMA, QN, QMA, QMA IP68, QLA, PC 7, PC 2.92, PC 2.4, N, MMCX, MCX, C, BNC, BMA, 7/16, 1023
Connectors 75 Ω	TNC, N, BMA, BNC, MCX
Frequency range	from DC up to 50 GHz

DC blocks

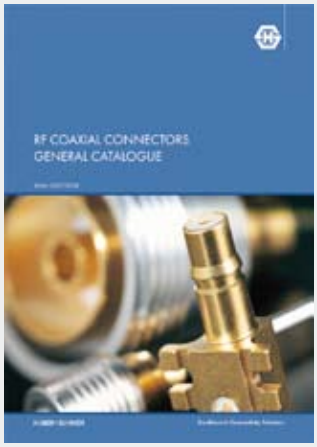
Frequency (GHz)	Interface	Voltage max. (V)	Block type	H+S type	Item no.
18	SMA	50	inner	1100.19.A	22645271
5	N	250	inner	1100.17.A	22550232
4	BNC	250	inner	1100.01.A	22550233
5	TNC	250	inner	1100.26.A	23001075

Resistive power divider

Interface	Frequency (GHz)	VSWR	Power max. (W)	H+S type	Item no.
BNC (fff)	2	1.15	1	4901.01.A	22550077
BNC (mff)	2	1.15	1	4901.01.B	22550078
TNC (mff)	2	1.15	1	4901.26.B	22550165
N (fff)	2	1.15	1	4901.17.A	22550252
TNC (fff)	2	1.15	1	4901.26.A	22640656
SMA (fff)	12.4	1.2	0.5	4901.19.A	22641657
N (mff)	2	1.15	1	4901.17.B	22643830

Note: BNC (mff) - all the tree port are BNC: male, female, female

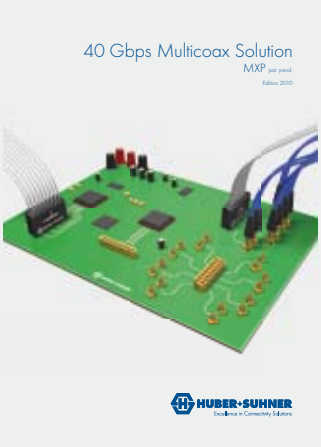
FURTHER CATALOGUES



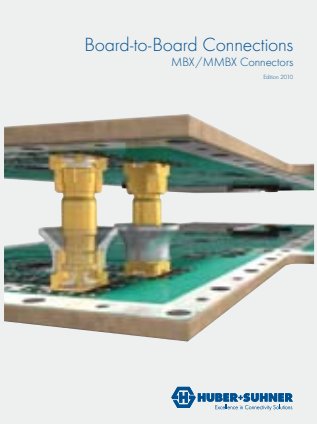
RF Coaxial Connectors

Item no. 644802

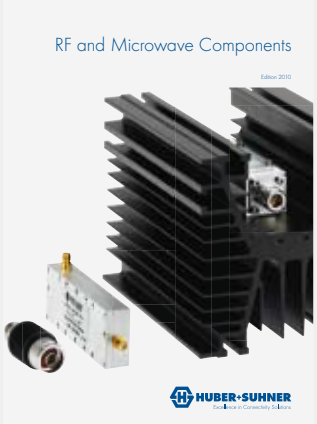
Microwave Cables and Assemblies
Item no. 23012500



40 Gbps Multicoax Solution MXP
Item no. 84104394



Board-to-Board Connections MBX/MMBX Connectors
Item no. 84104321



RF and Microwave Components
Item no. 84068668

Test+Measurement Components
Item no. 84068138

HUBER+SUHNER is certified according to
ISO 9001, ISO 14001, ISO/TS 16949 and IRIS.

WAIVER

It is exclusively in written agreements that we provide our customers with warrants and representations as to the technical specifications and/or the fitness for any particular purpose. The facts and figures contained herein are carefully compiled to the best of our knowledge, but they are intended for general informational purposes only.

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