

Series MMBX – micro miniature board connectors

Description

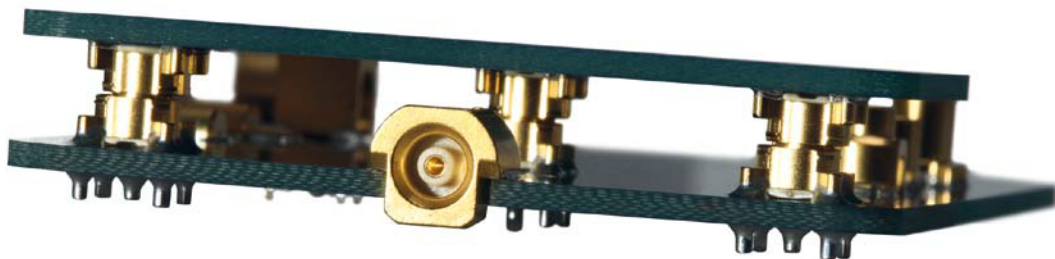
HUBER+SUHNER MMBX connectors are especially developed for board-to-board and board-to-module RF interconnections. Along with MBX the board-to-board portfolio of HUBER+SUHNER provides highest flexibility for today's and future radio module applications.

MMBX connectors offer an operation frequency up to 12.4 GHz. The series contains of a wide range of board and cable connectors with a minimum board-to-board distance of only 6.7 mm.

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Characteristics	Requirements
Frequency	DC to 12.4 GHz
Axial float (misalignment)	± 0.3 mm
Radial float (misalignment)	depending on the adaptor ± 0.4 mm (at 6.7 mm board-to-board distance)
Minimum board-to-board distance	6.7 mm
Minimum panel-to-board distance	4.63 mm
Minimum panel-to-panel distance	2.56 mm
Power	typical 260 W at 2.4 GHz at room temperature



Series MMBX – design guideline

Working range (axial and radial)

In mated condition, the two PCB connector have to be aligned within the dimension given for the axial and radial working range.

The axial working range is ± 0.3 mm, the radial working range at a board-to-board distance of 8 mm is ± 0.4 mm. The radial working range depends on the length of the adaptor: the longer the adaptor, the higher the radial working range.

Connecting range

The two PCB connector have to be aligned within the dimension given for connecting range when mating. In order to guarantee a blind mateable connection, the tilted adaptor will be guided by the funnel of the opposite connector. The connecting range depends on the length of the adaptor and the pull-in range (size of the funnel).

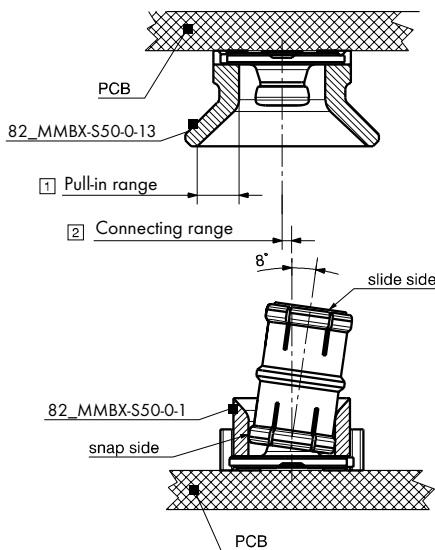
The connecting range in the example below is ± 0.8 mm for a pull-in range of 1.8 mm (see table below). If the funnel (pull-in range) is smaller than 0.95 mm, a blind mateable assembly process is not possible anymore. The radial working range (mated condition) can be different from the connecting range (mating process). The smaller value has to be considered for the design of the board-to-board connection (blind mateability).

Recommendation

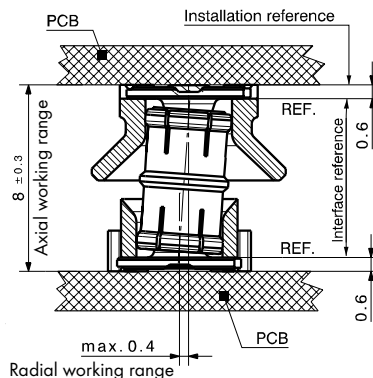
HUBER+SUHNER recommends using guiding pins to align the boards within the connecting range and working range. Distance holders to maintain the axial misalignment within working range are also of benefit.

HUBER+SUHNER provides outline drawings for every application with the relevant mechanical dimensions that need to be considered when designing-in MMBX. 3D 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

Series MMBX – technical data

MMBX PCB connectors – board-to-board/adaptors within series

Electrical data	Requirements		
Impedance	50 Ω		
Frequency range	DC to 12.4 GHz		
Dielectric withstanding voltage (at sea level)	1 kV rms, 50 Hz		
Working voltage (at sea level)	\leq 330 V rms, 50 Hz		
Insulation resistance	\geq 1 G Ω		
Contact resistance			
• Centre contact	\leq 5 m Ω		
• Outer contact	\leq 1 m Ω		
Return loss/VSWR	typical values for a board-to-board connection		
	board-to-board distance	DC to 2.5 GHz	2.5 to 6 GHz
	6.7 mm	26 dB/1.11	25 dB/1.12
	11.65 mm	26 dB/1.11	19 dB/1.25
	20.0 mm	26 dB/1.11	19 dB/1.25
RF-leakage (interface only)	\geq 70 dB (DC to 6 GHz) \geq 60 dB (6 to 12.4 GHz)		
Power	typical 260 W at 2.4 GHz at room temperature		

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

Environmental data	Test conditions		
Temperature range	–55 to +155 °C/–67 to +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	\geq 150 N/33.7 lbs		
• Pulling (vertical to PCB)	\geq 150 N/33.7 lbs		

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

Series MMBX – technical data

MMBX cable connectors

Electrical data	Requirements
Impedance	50 Ω
Frequency range	DC to 12.4 GHz
Dielectric withstanding voltage (at sea level)	750 V rms, 50 Hz
Working voltage (at sea level)	250 V rms, 50 Hz
Insulation resistance	$\geq 1 \text{ G}\Omega$
Contact resistance <ul style="list-style-type: none"> • Centre contact • Outer contact 	$\leq 5 \text{ m}\Omega$ $\leq 1 \text{ m}\Omega$
Return loss/VSWR (typical values)	$\geq 30 \text{ dB}/1.07$ (DC to 2.5 GHz) $\geq 25 \text{ dB}/1.12$ (2.5 to 6 GHz)

Mechanical data	Requirements
Engagement force	max. 30 N/max. 6.7 lbs
Disengagement force	8 to 30 N/1.8 to 6.7 lbs
Durability (matings)	100

Environmental data	Test conditions
Temperature range	-55 to $+155$ °C/ -67 to $+311$ °F
Climatic category	55/155/10
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

Material data		
Connector parts	Material	Plating
Centre contact	copper-beryllium alloy	SUCOPRO® gold plating
Outer contact	bronze/copper-beryllium alloy	SUCOPRO® gold plating
Body	brass	SUCOPRO® gold plating/SUCOPLATE®
Crimp ferrules	E-copper	SUCOPRO® gold plating/gold/ SUCOPLATE®
Insulators	PTFE/PFA	

Series MMBX – PCB connectors

Straight PCB jacks (female)

- Surface mount type SMT

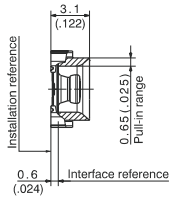


Fig. 1

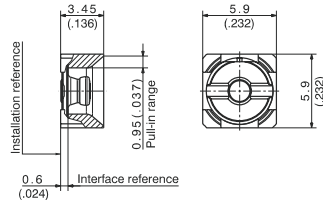


Fig. 2

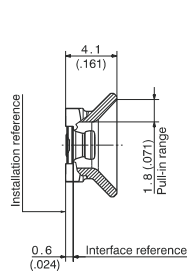
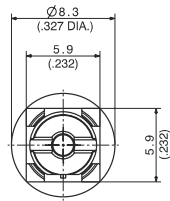


Fig. 3



82_MMBX-S50-0-1/111_NE	23001785	single	ML 122	pull-in range 0.65 mm/0.0256 in.	1
82_MMBX-S50-0-1/111_NH	23001784	bulk 100 pcs.			
82_MMBX-S50-0-1/111_NM	23001783	tape and reel			
82_MMBX-S50-0-3/111_NE	23015527	single	ML 122	pull-in range 0.95 mm/0.0374 in.	2
82_MMBX-S50-0-3/111_NH	23011273	bulk 100 pcs.			
82_MMBX-S50-0-3/111_NM	23031931	tape and reel			
82_MMBX-S50-0-13/111_NE	84032435	single	ML 122	pull-in range 1.80 mm/0.0709 in.	3
82_MMBX-S50-0-13/111_NH	23036608	bulk 100 pcs.			
82_MMBX-S50-0-13/111_NM	23041511	tape and reel			

Series MMBX – PCB connectors

Straight PCB jacks (female)

- Through hole type THT

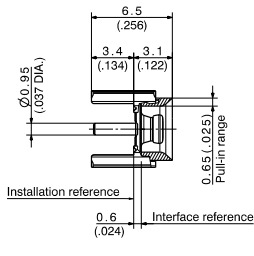


Fig. 1

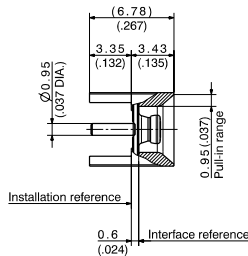


Fig. 2

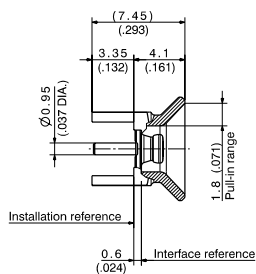
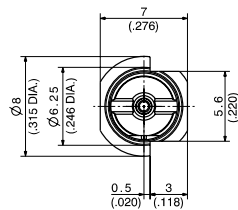
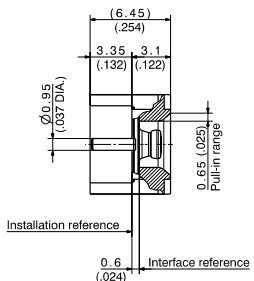


Fig. 3



HUBER+SUHNER type	Item no.	Packaging	Mounting hole	Notes	Fig.
82_MMBX-50-0-2/111_NE	23001788	single	ML 15	pull-in range 0.65 mm/0.0256 in.	1
82_MMBX-50-0-2/111_NH	23001787	bulk 100 pcs.			
82_MMBX-50-0-2/111_NM	23001786	tape and reel			
82_MMBX-50-0-4/111_NH	23013667	bulk 100 pcs.		pull-in range 0.95 mm/0.00374 in.	2
82_MMBX-50-0-14/111_NE	84032421	single		pull-in range 1.80 mm/0.0709 in.	3
82_MMBX-50-0-14/111_NH	23038051	bulk 100 pcs.			

Straight PCB jacks (female), edge mount

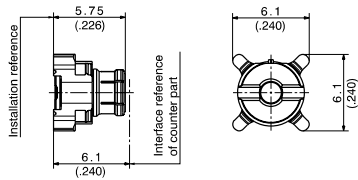


HUBER+SUHNER type	Item no.	Packaging	Mounting hole
92_MMBX-S50-0-12/111_NE	84019159	single	ML 147
92_MMBX-S50-0-12/111_NM	23038620	tape and reel	

Series MMBX – PCB connectors

Straight PCB plugs (male)

- Surface mount type SMT



HUBER+SUHNER type	Item no.	Packaging	Soldering pad
81_MMBX-S50-0-1/111_NE	23001782	single	ML 122
81_MMBX-S50-0-1/111_NH	23001781	bulk 100 pcs.	
81_MMBX-S50-0-1/111_NM	23001780	tape and reel	

- Through hole type THT

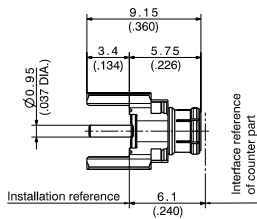


Fig. 1

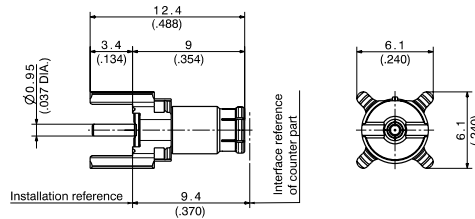


Fig. 2

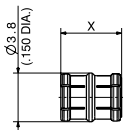


HUBER+SUHNER type	Item no.	Packaging	Mounting hole	Fig.
81_MMBX-50-0-2/111_NE	23001779	single	ML 15	1
81_MMBX-50-0-2/111_NH	23001778	bulk 100 pcs.		2
81_MMBX-50-0-2/111_NM	23001776	tape and reel		
81_MMBX-50-0-11/111_NM	23028072	tape and reel		

Series MMBX – adaptors within series

Straight adaptors

- Plug to plug (male)



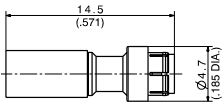
HUBER+SUHNER type	Item no.	Packaging	Board-to-board distance	Adaptor length X	Min. pull-in range
32_MMBX-50-0-1/111_NE 32_MMBX-50-0-1/111_NY	23001749 84028418	single industrial 200 pcs.	6.7 mm/0.264 in.	4.8 mm/0.189 in.	0.65 mm/0.026 in. ¹⁾
32_MMBX-50-0-12/111_NH	84004734	bulk 100 pcs.	8.0 mm/0.315 in.	6.0 mm/0.236 in.	0.95 mm/0.037 in.
32_MMBX-50-0-4/111_NE 32_MMBX-50-0-4/111_NY	23010564 23038658	single industrial 300 pcs.	10.0 mm/0.394 in.	8.0 mm/0.315 in.	1.80 mm/0.071 in.
32_MMBX-50-0-13/111_NE	84031096	single	12.0 mm/0.472 in.	10.0 mm/0.417 in.	1.80 mm/0.071 in.
32_MMBX-50-0-5/111_NE 32_MMBX-50-0-5/111_NY	84026915 23011920	single industrial 200 pcs.	14.0 mm/0.551 in.	12.0 mm/0.472 in.	1.80 mm/0.071 in.
32_MMBX-50-0-10/111_NY	23034946	industrial 200 pcs.	15.0 mm/0.591 in.	13.0 mm/0.512 in.	1.80 mm/0.071 in.

Adaptors with other lengths available upon request.

¹⁾ Only suitable pull-in-range.

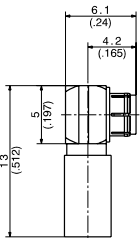
Series MMBX – cable connectors

Straight cable plugs (male)



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
11_MMBX-50-2-2/111_NE	23001744	U4 (EF_316_D)	single	27351	1/A

Right angle cable plugs (male)



HUBER+SUHNER type	Item no.	Cable group (example)	Packaging	Assembly instruction	Crimp insert
16_MMBX-50-2-2/111_NE	23001746	U4 (EF_316_D)	single	27352	A
16_MMBX-50-2-2/111_NH	84028931		bulk 100 pcs.		

Series MMBX – receptacles with solder end

Receptacle, jack (female)

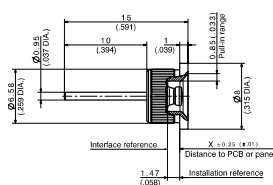
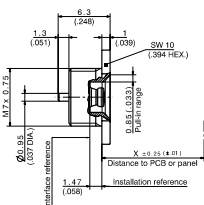


Fig. 1

Fig. 2

HUBER+SUHNER type	Item no.	Packaging	Assembly instruction	Fig.
22_MMBX-50-0-1/111_NE	23008312	single	screwed-in	1
22_MMBX-50-0-2/111_NY	84005177	industrial 100 pcs.	pressed-in	2

Series MMBX – assembly and disassembly tools



Fig. 1



Fig. 2

74_Z-0-0-437	23023494	single	0000189947	1
74_Z-0-0-557	84032418		0000246815	2