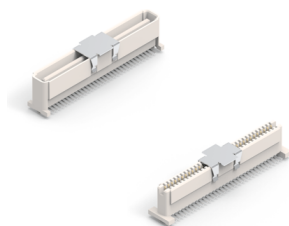


WR-BTB Board-to-Board 1.0 mm

1.0 mm pitch Variable Mating Height Board-to-Board Connectors

Overview



Characteristics

- Board-to-board distance : 7.75 mm to 14.75 mm
- Dual row
- Polarity: 64 pins
- Compatible with PCIe 2.0 and equivalent standards

Applications

- Industrial Electronics
- Networks and Telecommunications
- E-Mobility
- Smart Power/ Smart Grid Solutions

General Information

Kind Properties:

Properties		Value	Unit
Pitch	P	1	mm
Gender		Male Plug	
Type		Vertical	

Material Properties:

Insulator Material	LCP
Insulator Flammability Rating	UL94 V-0
Insulator Color	Ivory
Contact Material	Brass
Contact Plating	Selective Gold
Contact Type	Stamped

General Information:

Operating Temperature	-55 °C up to +85 °C
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Electrical Properties:

Properties		Test conditions	Value	Unit	Tol.
Rated Current	I_R		1	A	
Working Voltage			100	V (AC)	
Withstanding Voltage		1 min	250	V (AC)	
Contact Resistance	R		30	mΩ	max.
Insulation Resistance	R_{ISO}		1000	MΩ	min.

Certification:

RoHS Approval	Compliant [2011/65/EU&2015/863]
REACH Approval	Conform or declared [(EC)1907/2006]
Halogen Free	Conform [IEC 61249-2-21]
Halogen Free	Conform [JEDEC JS709B]
UL Approval	E323964 [E323964]

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Specific Information

Signal Integrity

More detailed information to signal Integrity on WR-BTB series is available with the Application Note ANE025:

we-online.com/ANE025

Single-ended Signaling

The impedance in GSG configuration is 50 ± 10 Ohm (50 Ohm simulated). The Würth Elektronik 1mm pitch Board-to-Board connectors series can be assembled with different mated heights. The lowest mated height possible is 7.75mm, the highest is 14.75mm. When tested with a 50 Ohm transmission line in a GSG test fixture, the experimental Insertion Loss profile can be modeled with a safety margin using the following equation:

$$IL(f) = (A_{7.75mm} + nA_{mm})f^2 + (B_{7.75mm} + nB_{mm})f + (C_{7.75mm} + nC_{mm})$$

The equation states that the insertion loss (IL) of the interconnect, when measured in a 50 Ohm GSG test fixture, can be approximated by a second-order polynomial function of frequency f . This model includes a safety margin, meaning it intentionally overestimates the loss slightly to stay on the safe side when predicting performance.

Example: for a mated height of 12.75mm, n will be 5, so the model will be: $IL(f) = (A_{7.75mm} + 5 \cdot A_{mm})f^2 + (B_{7.75mm} + 5 \cdot B_{mm})f + (C_{7.75mm} + 5 \cdot C_{mm})$

Using the following parameters with f in GHz with the WR-BTB 1.0 mm Variable Mating Height Board-to-Board Connectors series shows following results:

GSG Insertion loss parameters for 7.75 mm mated height:

- $A_{7.75mm} = -2.41 \cdot 10^{-2}$
- $B_{7.75mm} = -3.24 \cdot 10^{-1}$
- $C_{7.75mm} = -7.00 \cdot 10^{-1}$

GSG Insertion loss parameters for each additional 1 mm mated height:

- $A_{mm} = -2.54 \cdot 10^{-4}$
- $B_{mm} = -2.30 \cdot 10^{-3}$
- $C_{mm} = 0$

The parameters with the formula mentioned above result in the following diagram:

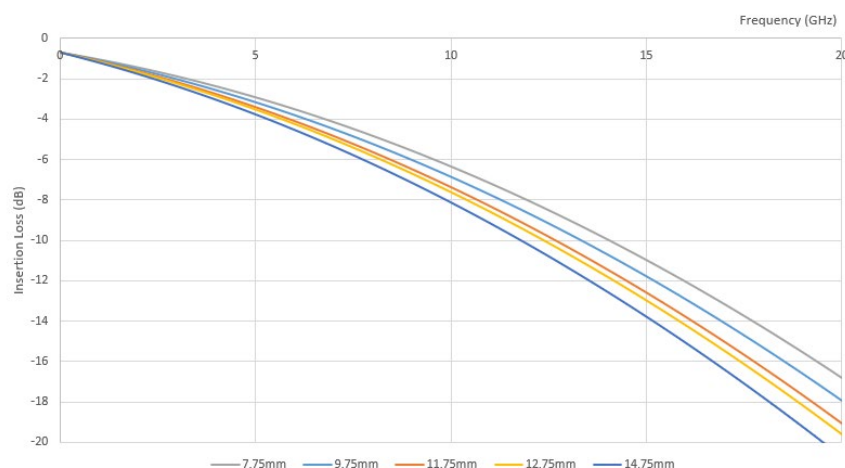


Figure 1: WR-BTB 1.0 mm Variable Mating Height Board-to-Board Connectors GSG 50 Ohm Insertion loss profile.

The safety margin of this loss profile is about 1dB at 10GHz

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Specific Information

Differential Signaling

The differential impedance in GSSG configuration of this connector is $100 \pm 10 \text{ Ohm}$ (xx Ohm simulated). When tested with a 100 Ohm reference differential transmission line in a GSSG test fixture, the experimental Insertion Loss profile (in dB) can be modeled with a safety margin using the following equation:

$$IL(f) = (A_{7.75\text{mm}} + nA_{\text{mm}})f^2 + (B_{7.75\text{mm}} + nB_{\text{mm}})f + (C_{7.75\text{mm}} + nC_{\text{mm}})$$

Using the following parameters with f in GHz:

GSG Insertion loss parameters for 7.5 mm mated height:

- $A_{7.75\text{mm}} = -3.35 \cdot 10^{-2}$
- $B_{7.75\text{mm}} = -3.01 \cdot 10^{-2}$
- $C_{7.75\text{mm}} = -4.50 \cdot 10^{-1}$

GSG Insertion loss parameters for each additional 1 mm mated height:

- $A_{\text{mm}} = -1.76 \cdot 10^{-3}$
- $B_{\text{mm}} = -8.90 \cdot 10^{-4}$
- $C_{\text{mm}} = 0$

The parameters with the formula mentioned above result in the following diagram:

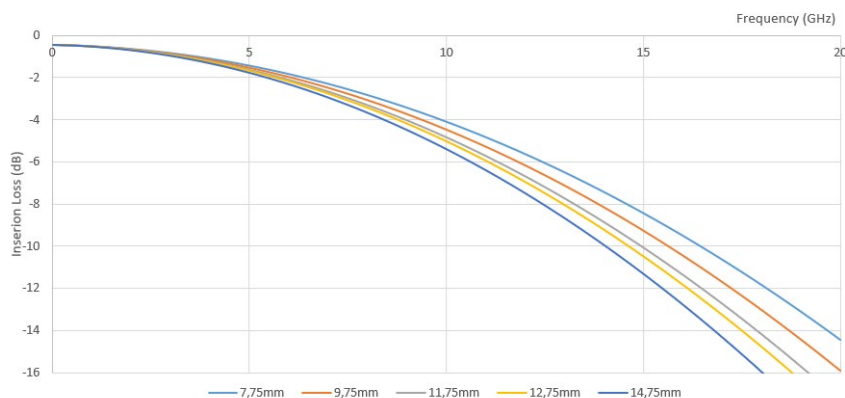


Figure 4: WR-BTB 1.0 mm pitch Variable Mating Height Board-to-Board Connectors GSSG 100 Ohm differential Insertion loss profile

The safety margin of this loss profile is about 1dB at 10GHz.

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