



Precision RF Connectors Field-Replaceable & Solderable

INTRODUCTION

Carlisle Interconnect Technologies (CarlisleIT) offers a wide portfolio of low-loss, high-frequency Precision RF Connectors in various configurations for design flexibility and multiple applications.

- » 50 Ω impedance
- » Frequencies supported up to 65 GHz
- » Multiple mating interfaces available: 1.85 mm, 2.4 mm, 2.92 mm, and 3.5 mm
- » CarlisleIT will provide your board layout and optimized footprint based on your board stack-up

FEATURES	BENEFITS
1.85 mm, 2.4 mm, 2.92 mm, and 3.5 mm mating interfaces	• Multiple interface options cover a wide frequency band, offering readily-available standard stock with working frequencies up to 65 GHz
Field-replaceable options available	• Elimination of soldering allows the high-performance connectors to be installed quickly and easily and to be removed/reused without causing damage to the board
Vertical flange-mount, edge-launch, and board-mount options	• Provides design flexibility for density limitations and allows placement anywhere on the PCB
Gold-plated brass bodies (solder connectors only)	• Improved solderability and corrosion resistance
Rated to 500 mating/de-mating cycles	• Robust design ensures high signal integrity in a long-life package



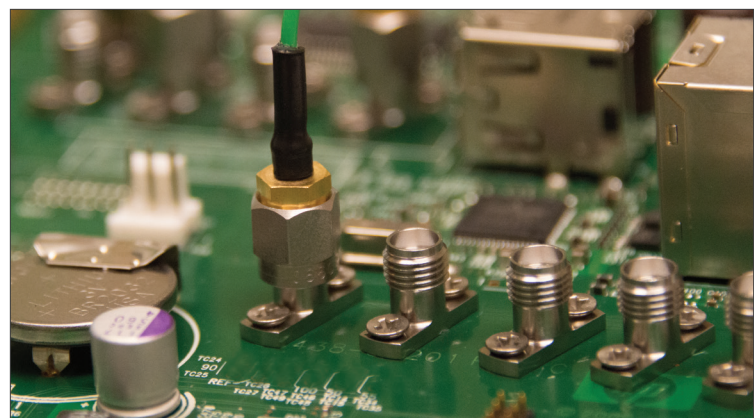
Field-Replaceable



Solderable

SUGGESTED APPLICATIONS

- » High-Speed Digital Systems
- » Vector Network Analyzer (VNA)
- » Oscilloscope
- » Bit Error Ratio Tests (BERT)
- » Switch Matrix
- » Automatic Test Equipment (ATE)
- » Semiconductors
- » Design Validation Testing
- » Integrators
- » Military/Defense
- » Electronic Sensors
- » Radar/Guidance Systems



Learn more: CarlisleIT.com/prod-info/precision-rf-connectors

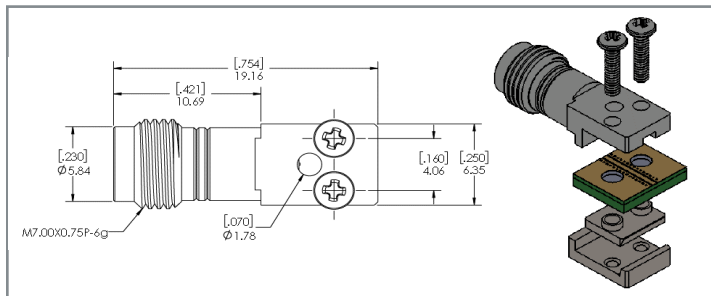
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PRODUCT NUMBERS & SPECIFICATIONS

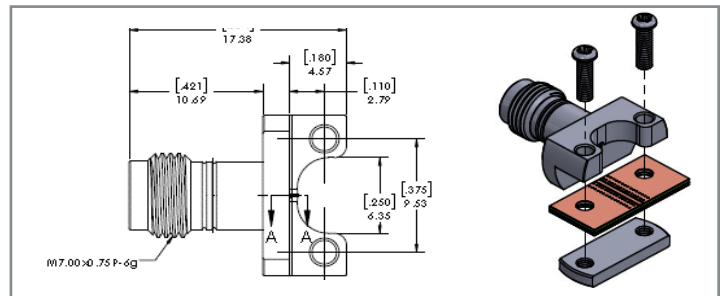
Size	Part No.	Description	Termination Style	Orientation	Freq.
1.85 mm	TMB-V8F2-3LC	1.85 mm Female, 2-Hole Flange, CPW	Field Replaceable	Vertical	DC - 65 GHz
	TMB-E8FS-1S1	1.85 mm Female Straight, Solder Mount	Manual Solder	Edge Mount	
	TMB-V8FS-3SM	1.85 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E8F2-1L1	1.85 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-E8F2-1L1-01	1.85 mm Female Narrow Body	Field Replaceable	Edge Mount	
	TM14-0089-00	1.85 mm Angled Connector Jack	Field Replaceable	Vertical	
	TMB-V8F2-3L1	1.85 mm Female 2-Hole Flange, Stripline	Field Replaceable	Vertical	
	TMB-E8FS-1ST	1.85 mm Straight Jack, Shielded	Solder Mount	Edge	
2.4 mm	TMB-V4F2-3LC	2.4 mm Female, 2-Hole Flange, CPW	Field Replaceable	Vertical	DC - 50 GHz
	TMB-E4FS-1S1	2.4 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V4FS-3SM	2.4 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E4F2-1L1	2.4 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-E4F2-1L1-01	2.4 mm Female Narrow	Field Replaceable	Edge Mount	
	TMB-E4FS-1ST	2.4 mm Straight Jack, Shielded	Solder Mount	Edge	
2.92 mm	TMB-V9F2-3LC	2.92 mm Female, 2-Hole Flange, CPW	Field Replaceable	Vertical	DC - 40 GHz
	TMB-E9FS-1S1	2.92 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V9FS-3SM	2.92 mm Female Straight	Mixed Technology Solder	Vertical	
	TMB-E9F2-1L1	2.92 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-E9F2-1L1-01	2.92 mm Female Narrow	Field Replaceable	Edge Mount	
	TMB-V9F2-3L1	2.92 mm Female, 2-Hole Flange, Stripline	Field Replaceable	Vertical	
	TMB-E9FS-1ST	2.92 mm Straight Jack, Shielded	Solder Mount	Edge	
3.5 mm	TMB-V5F2-3LC	3.5 mm Female, 2-Hole Flange, CPW	Field Replaceable	Vertical	DC - 34 GHz
	TMB-E5FS-1S1	3.5 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V5FS-3SM	3.5 mm Female Straight	Mixed Technology Solder	Vertical	
	TMB-E5F2-1L1	3.5 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-E5F2-1L1-01	3.5 mm Female Narrow	Field Replaceable	Edge Mount	
	TMB-V5F2-3L1	3.5 mm Female 2-Hole Flange, Stripline	Field Replaceable	Vertical	
	TMB-E5FS-1ST	3.5 mm Straight Jack, Shielded	Solder Mount	Edge	
	TMB-V5FS-3SM-01	3.5 mm Female Straight, Long Leads	Manual Solder	Vertical	

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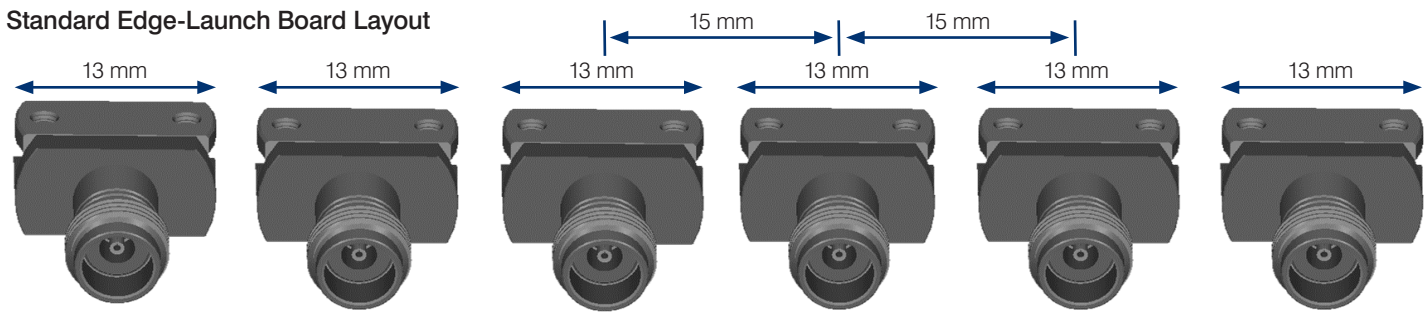
Field-Replaceable – Narrow Body Edge Launch



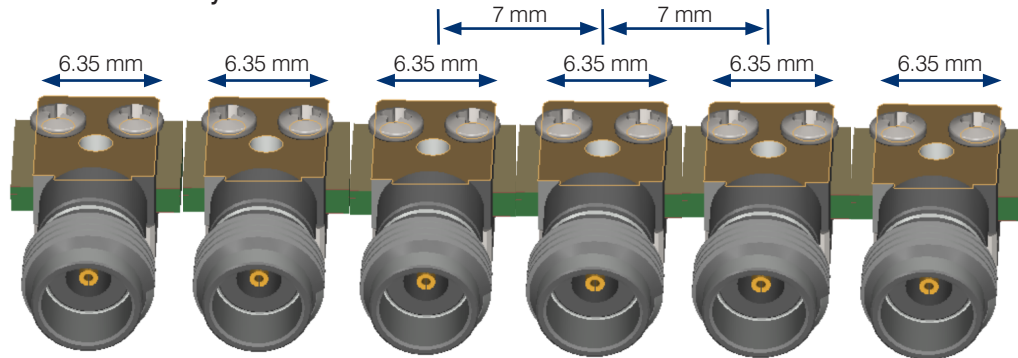
Field-Replaceable – Standard Edge Launch

Narrow body edge-launch field-replaceable connectors have about 50% less width compared to standard edge launch connectors. Minimum center-to-center pitch between narrow body connectors can be as little as 7 mm. Compared to 15 mm standard connectors, this saves approximately 50% PCB space in dense layouts, as shown in the illustrations below.

Standard Edge-Launch Board Layout



Narrow Body Edge-Launch Board Layout



PERFORMANCE SPECIFICATIONS

Connector Series	Frequency Rating	Connector Only		Connector & PCB	
		Return Loss (-20 dB max)	Insertion Loss (-0.2 dB max)	Return Loss (-15 dB max)	Insertion Loss (-0.6 dB max)
1.85 mm	DC - 65 GHz	67 GHz		67 GHz	
2.4 mm	DC - 50 GHz	50 GHz		50 GHz	
2.92 mm	DC - 40 GHz	40 GHz		40 GHz	
3.5 mm	DC - 34 GHz	34 GHz		34 GHz	

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SIGNAL INTEGRITY PERFORMANCE

CarlisleIT Precision RF Connectors have a consistent impedance profile and perform well on a component level with no resonances. Figure 1 shows the insertion loss and return loss of a 2.92 mm Vertical-Mount Field-Replaceable Connector. Minimum return loss of -25 dB and maximum insertion loss of -0.02 dB are seen at 70 GHz, making these connectors suitable for use in high-frequency applications. Since these connectors can be moved easily between the connector footprints on the same or different PCBs, they provide excellent design and maintenance flexibility in RF systems.

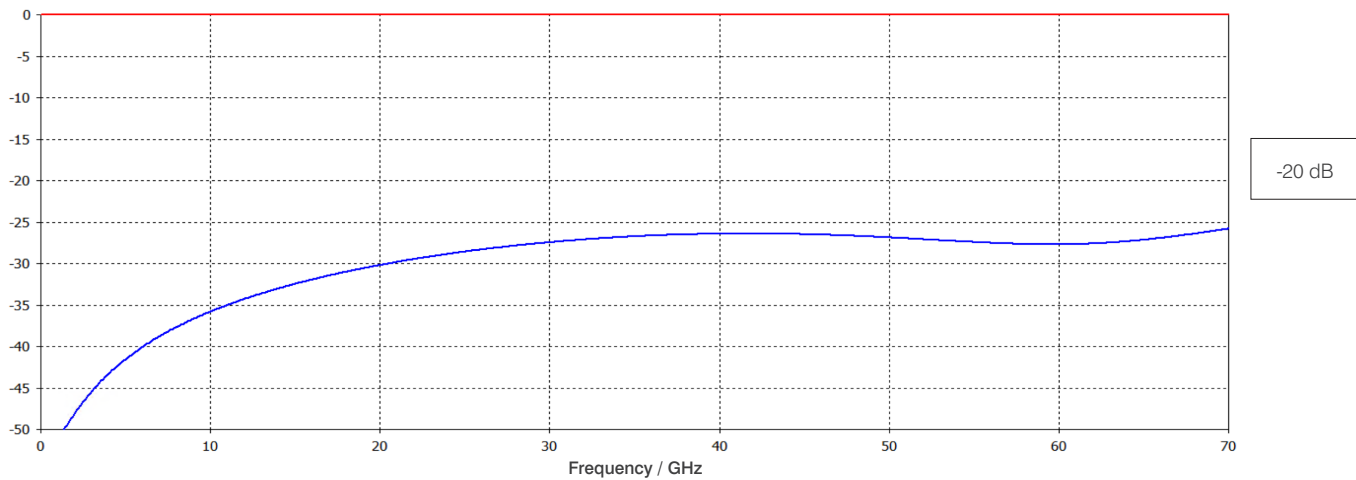


Fig 1: Insertion Loss and Return Loss of a 2.92 mm Vertical-Mount Field-Replaceable Connector

Similarly, the time domain response of the same connector is shown in Figure 2 below, illustrating that the impedance profile remains consistent at 50 Ω with minimal variations seen at transition interfaces.

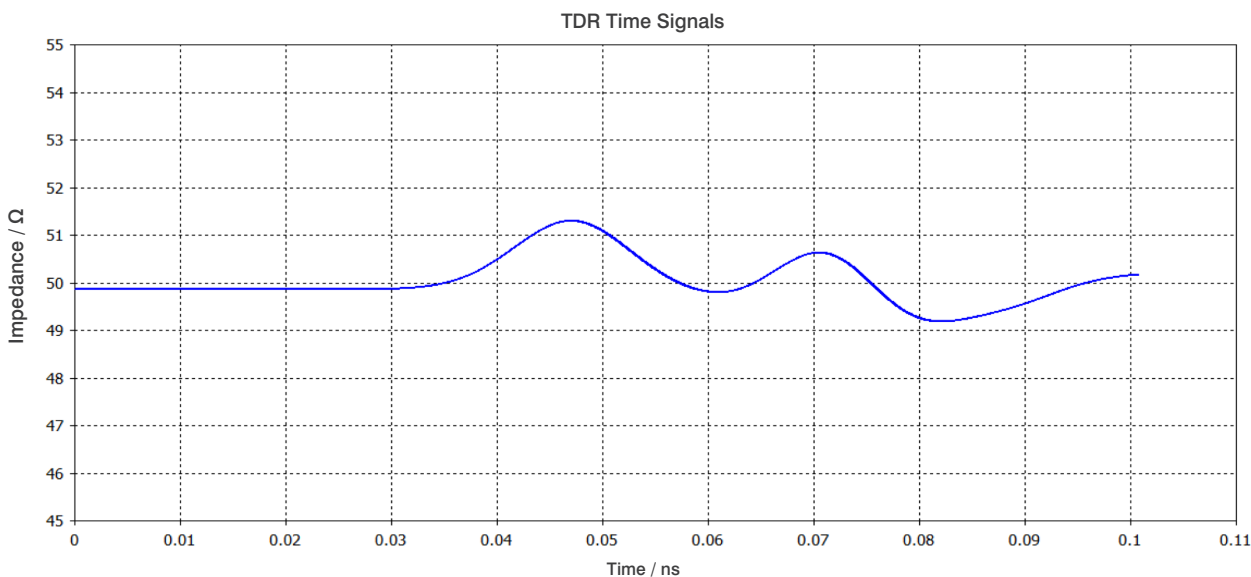


Fig 2: Time Domain Response of a 2.92 mm Vertical-Mount Field-Replaceable Connector

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SIGNAL INTEGRITY PERFORMANCE (CONT.)

Soldered RF Connectors are more suitable for applications that have fixed interfaces which require no field replacement or RF channel changes on the boards. They provide ruggedness and reliability, especially for operations in harsh conditions like vibrations, high-speed movement, law enforcement, military use, etc. Figure 3 shows the insertion loss and return loss of a 2.92 mm soldered connector. Minimum return loss of -20 dB and maximum insertion loss of -0.06 dB are seen at 70 GHz.

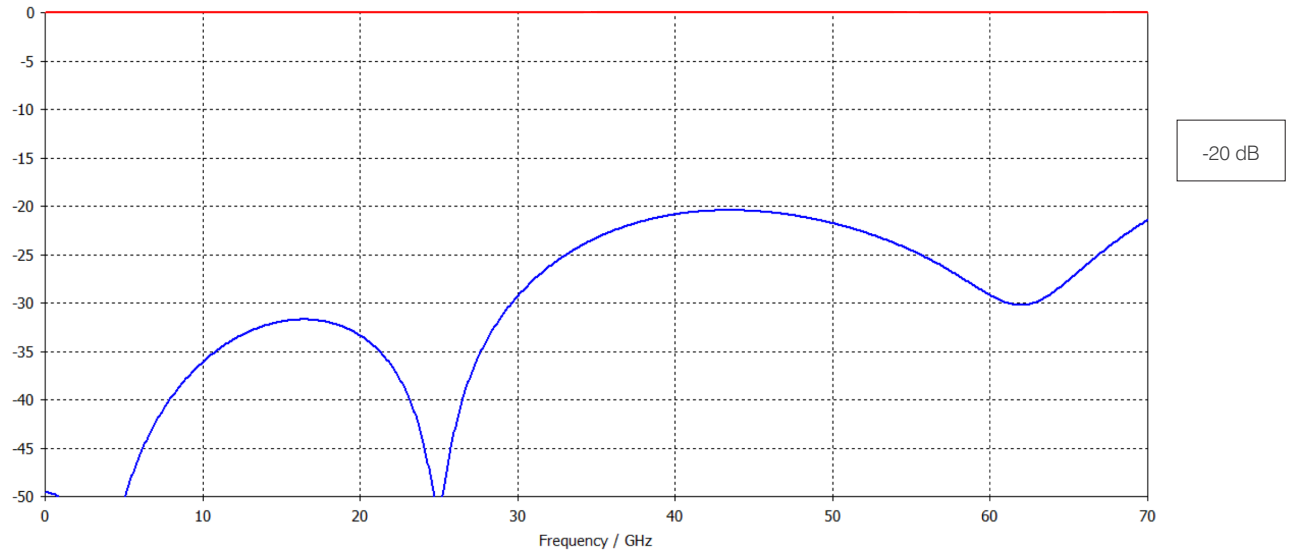


Fig. 3: Insertion Loss and Return Loss of a 2.92 mm Vertical-Mount Field-Replaceable Connector

Similarly, the time domain response of the same connector is shown in Figure 4 below, illustrating that the impedance profile remains consistent at 50 Ω and is very similar to the profile of the field-replaceable connectors.

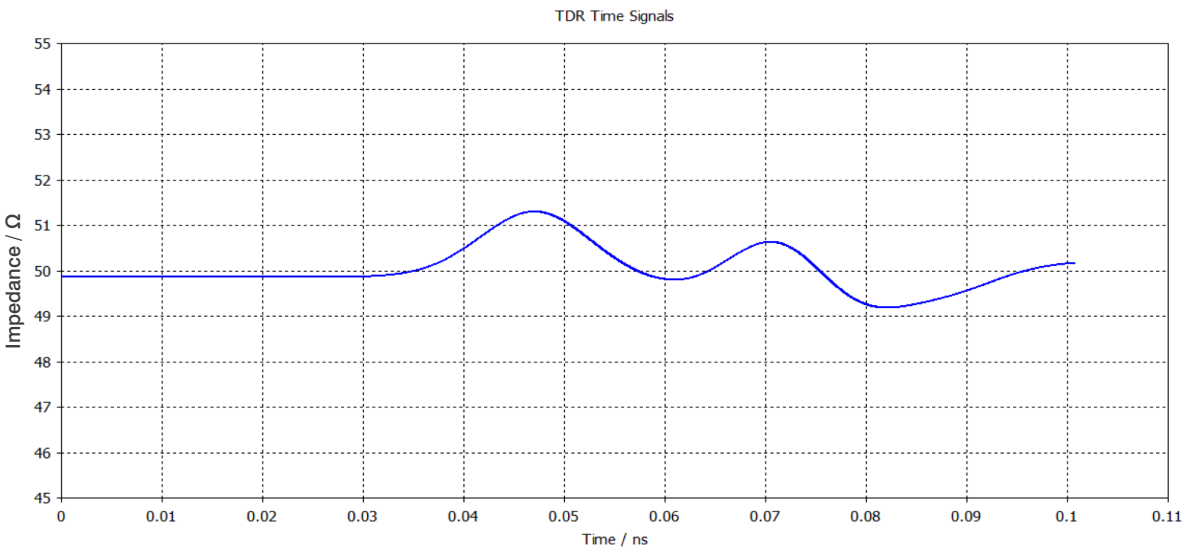


Fig. 4: Time Domain Response of a 2.92 mm Soldered Vertical-Mount Connector



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