

Amphenol® RF



AFI Product Series Solutions Guide

Board-to-Board Solutions



ABOUT AMPHENOL RF

Amphenol RF, a division of Amphenol Corporation, is the largest manufacturer of radio frequency connectors, coaxial adapters and RF cable assemblies in the world.

With a global team of experienced engineers, Amphenol RF is able to offer the broadest portfolio of standard RF products on the market today.

As a leader in design and manufacturing of RF interconnect products, our dedicated team of engineers specialize in custom product development to meet the challenges of design-specific constraints.

GLOBAL PRESENCE



With a global presence, Amphenol RF has experienced engineers and production capabilities in multiple regions across the globe. Our experienced cross-functional teams oversee the entire process from the initial design through delivery, and beyond.

Amphenol RF has a global footprint of operations in North America, Europe and Asia.

AFI PRODUCT SERIES

The Amphenol RF AFI connector series is a proprietary interface that offers a reliable and versatile board-to-board solution designed for applications requiring high-frequency performance. These connectors are compact, with a push-on mating mechanism that ensures quick and secure connections, even in densely populated PCB layouts. The AFI series supports frequencies up to 6 GHz, providing excellent signal integrity for high-speed data transmission and industry leading float to compensate for axial and radial misalignment due to packaging tolerances. The shrouded design and floating bullet allow for mating to occur when there is misalignment of the radial and axial planes between connectors

Unlike other board-to-board connectors, the AFI connector series allows for the stack height dimensions to be modified using the PCB jack side of the connector as opposed to the bullet. With multiple stack height options and various configurations, the AFI series is ideal for applications in telecommunications, networking, industrial automation, and consumer electronics, delivering robust performance and design flexibility.

FEATURES AND BENEFITS

- Proprietary two-piece board-to-board design with embedded bullet adapter
- Industry leading float system of .030" [0.8 mm] radial and .040" [1.0 mm] axial
- Multiple PCB mounting configurations allow for design versatility
- True blindmate solution
- Stamped bullet which is replaceable if damaged
- Extensive 50 and 75 ohm connector options available

APPLICATIONS

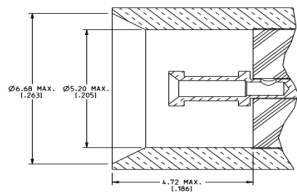
- Military / Aerospace
- Cable Modern Termination Systems (CMTS)
- Broadband
- Internet Routers & Switches
- Telecommunications
- Daughter Cards / Backplanes

AFI PRODUCT SERIES

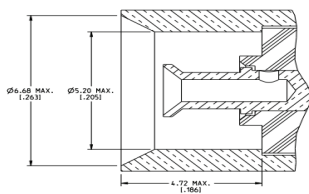
Amphenol RF’s AFI series is designed with board-to-board solutions in mind. These stamped and formed connectors are manufactured with a built-in bullet adapter to provide a seamless two-piece configuration.

INTERFACE DIMENSIONS

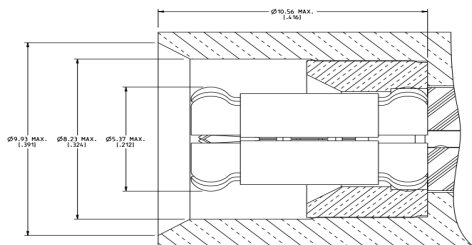
75 OHM JACK



50 OHM JACK



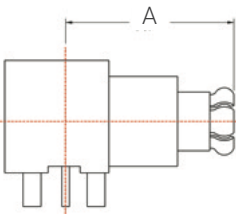
PLUG WITH INSTALLED BULLET



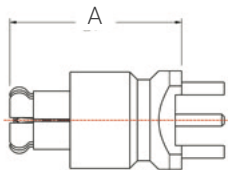
CALCULATING BOARD SPACING

To calculate the board to board spacing, take “Dimension A” from the plug you are using (labeled in the below table) and “Dimension B” from the jack you are using (labeled in the below table) and add Dimension A to Dimension B to get the total board to board spacing.

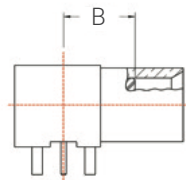
RIGHT ANGLE PLUG



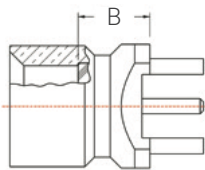
STRAIGHT PLUG



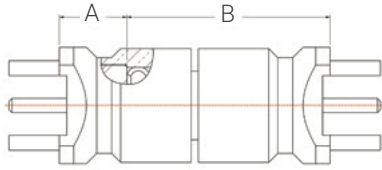
RIGHT ANGLE JACK



STRAIGHT JACK



STRAIGHT JACK



STRAIGHT PLUG

PCB MOUNTED CONNECTORS

AFI PCB connectors offer a robust board-to-board RF solution designed for high-performance signal transmission in compact electronic systems. These connectors ensure a secure and stable connection between PCBs, supporting applications where precision alignment and signal integrity are critical, such as in modular designs, test systems or embedded applications.

Connector Body Types

- Full Detent** – A full detent has an undercut that the female tines snap into, allowing for secure mating.
- Smooth Bore** – A smooth bore interface does not use an undercut. The female tines compress to ensure a secure connection.

PCB Jacks

50 Ohm

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension B (mm)
920-160J-51P	Straight	Surface Mount	Smooth Bore	6	1.46
920-179J-51S	Straight	Through Hole	Smooth Bore	3	9.22
920-185J-51A	Right-Angle	Through Hole	Smooth Bore	6	6.87

PCB Jacks

50 Ohm continued

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension B (mm)
920-193J-51P	Straight	Through Hole	Smooth Bore	6	3.55
920-222J-51S	Straight	End Launch	Smooth Bore	6	5.08
920-250J-51P	Straight	Through Hole	Smooth Bore	6	4.71
920-251J-51P	Straight	Through Hole	Smooth Bore	6	5.71
920-256J-51P	Straight	Through Hole	Smooth Bore	6	1.44
920-262J-51P	Straight	Through Hole	Smooth Bore	6	8.71
920-265J-51P	Straight	Through Hole	Smooth Bore	6	3.71
920-266J-51P	Straight	Through Hole	Smooth Bore	6	9.71

75 Ohm

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension B (mm)
920-133J-71P	Straight	Through Hole	Smooth Bore	1	4.60
920-142J-71A	Right-Angle	Through Hole	Smooth Bore	6	4.20
920-161J-51P	Straight	Through Hole	End Launch	6	2.54
920-192J-71A	Right-Angle	Through Hole	Smooth Bore	6	4.30

PCB Plugs

50 Ohm

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension A (mm)
920-186P-51P	Straight	Through Hole	Full Detent	3	15.74
920-224P-51S	Straight	End Launch	Full Detent	6	14.88
920-233P-51A	Right-Angle	Through Hole	Full Detent	6	15.27
920-248P-51P	Straight	Through Hole	Full Detent	6	13.29
920-252P-51P	Straight	Surface Mount	Full Detent	6	10.6
920-255P-51P	Straight	Through Hole	Full Detent	6	11.29
920-260P-51P	Straight	Surface Mount	Full Detent	6	16.65

PCB Plugs

50 Ohm continued

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension A (mm)
920-263P-51P	Straight	Through Hole	Full Detent	6	12.29
920-264P-51P	Straight	Through Hole	Full Detent	6	15.29
920-307P-51P	Straight	Surface Mount	Full Detent	5	11.54

PCB Plugs

75 Ohm

Part Number	Orientation	Body Mount	Detent Type	Max Frequency (GHz)	Dimension A (mm)
920-123P-71P	Straight	End Launch	Full Detent	1	14.41
920-132P-71P	Straight	Through Hole	Full Detent	1	13.81
920-140P-71A	Right-Angle	Through Hole	Full Detent	6	13.40

AFI ADAPTERS

AFI adapters provide a seamless transition between the AFI interface and either the SMA or MCX interface without the need for cables which is ideal for applications with space constraints.

AFI Between-Series Adapters

Part Number	Configuration	Impedance	Orientation	Max Frequency (GHz)	Special Features
APH-SMAF-AFIF	AFI Jack to SMA Jack	50 Ohm	Straight	6	
APH-SMAF-AFIM	AFI Plug to SMA Jack	50 Ohm	Straight	6	
APH-SMAP-AFIF	AFI Jack to SMA Plug	50 Ohm	Straight	6	
901-10199	AFI Plug to SMA Jack	50 Ohm	Straight	3	4-Hole Flange
920-145A-51S	AFI Jack to MCX Jack	50 Ohm	Straight	6	
920-146A-51S	AFI Plug to MCX Jack	50 Ohm	Straight	6	

TECHNICAL SPECIFICATIONS

Electrical

Impedance	50 Ohm	75 Ohm	
Frequency Range	DC - 6 GHz	DC - 3 GHz	
Voltage Rating	335 Volts RMS Continuous		
Dielectric Withstanding Voltage	1000 Volts RMS Min		
VSWR (Return Loss)			
DC - 1 GHz	1.08 (-28 dB) Max	DC - 2 GHz	1.11 (-26 dB) Max
1 - 3 GHz	1.12 (-25 dB) Max	2 - 3 GHz	1.3 (-25 dB) Max
3 - 6 GHz	1.3 (-18 dB) Max		
Insulation Resistance	1000 MΩ Min		
Center Contact Resistance	5 mΩ Min	7 mΩ Min	
Outer Contact Resistance	1 mΩ Min		
RF Leakage (Interface)	-70 dB Min (DC - 3 GHz)		
Insertion Loss	.1 √(f(GH)) dB Max		
Power Handling	200 W @ 2.2 GHz @ 85 °C		

Environmental

Temperature Change	-65°C to +165°C
Coupling Mechanism	EIA-364-32, Method A, Condition II, 25 Cycles
Corrosion	EIA-364-65, Condition IIA, 336 hours
Vibration	EIA-364-28, Condition V, Letter C, for 120 Minutes in each of 3 directions
Mechanical Shock	EIA-364-27, Condition A, 3 shocks in each direction (18 total)
Moisture Resistance	EIA-364-31, Method III, Condition B

Mechanical

Mating Cycles	100 Min
Coupling Mechanism	Push-On
Interface Specification	Amphenol RF Proprietary
Engagement Force	0.5 lbs
Disengagement Force	0.5 - 3.0 lbs
Mechanical Misalignment	Axial 1.0 mm
	Radial 0.8 mm
	Min Board-to-Board Distance 12.7 mm

Note: Technical specifications are typical and may vary by specific part number and design. See component drawing for additional details.

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Learn More

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