

COAX WIRELESS JUMPERS > PRODUCT GUIDE





MEETING THE PERFORMANCE NEEDS > OF NEXT-GENERATION MOBILE NETWORK EQUIPMENT

Molex's complete line of factory installed RF coax jumpers offer the wireless industry consistent superior performance. Molex designs and manufactures custom connectors and optimizes the performance of the jumpers for excellent Passive Intermodulation (PIM) and Return Loss (RL) results.

COAX WIRELESS JUMPERS

About Molex RF

Today's complex cell site buildout demands more data throughput, more robust systems and more stringent RF performance. The transmission of information is critical to overall network's Quality of Service (QoS) and the RF connections are the pipeline from the antenna to the radio equipment. Every interconnection from the antenna to the radio must deliver consistent electrical performance under stringent environmental conditions.

Molex uses 360-degree lead-free solder joints that physically bond the connector to the jumper cable providing long-term reliability in rugged environmental conditions. Our jumpers are guaranteed to perform to meet IP68 water ingress. As part of our manufacturing process, all factory-made jumpers are serialized and tested 100% for PIM and Return Loss (RL).

For additional waterproof protection, Molex has developed a series of one-piece weatherproof boots that are pre-installed at our factories. These weatherproof boots are designed to fit very tight center-line to center-line spacing where connector real estate is tight. Molex offer these boots for all our connector series including, 4.3-10, 4.1/9.5, DIN 7/16 and Type N.

Molex has launched their new 2.2-5 connector systems designed to meet the rising performance needs of mobile network equipment combined with reducing size for space reduction requirements at ~30% smaller than DIN 7/16.

This new interface offers very low PIM performance together with weight and size advantages. A key feature of this connector is the separation of the electrical and mechanical plane, which insures consistent PIM and RL performance.

Equipment and Expertise

Our core staff members of the Molex RF/Microwave Business Unit possess extensive experience in the design and manufacture of high-quality connectors that perform at frequencies up to 65 GHz. The RF/Microwave product specialists at Molex have a thorough knowledge of applicable industry standards, tolerances, specifications and electrical characteristics.

Molex is a full-service provider. Our engineering lab is equipped with RF/Microwave test equipment operation to 65 GHz as well as environmental test capabilities. Designs are verified using advanced computer modeling techniques to assure they meet all electrical requirements. Utilizing materials and procedures that are in compliance with industry standard specifications such as MIL-STD-348, DIN, IEC and CECC. Precision and repeatability are key to our manufacturing processes which include both semi and fully automated manufacturing systems. Our top of the line CNC equipment provides quick changeover time giving us maximum flexibility.

COAX WIRELESS JUMPERS

Factory Made Jumpers	Product	Description	Field Installable Connectors
	4.3-10	<ul style="list-style-type: none"> • 30% smaller than DIN 7/16 which decreases operational expenditures by reducing tower loading • Three mating options for right-angle and vertical plugs (hand tight, quick lock and torque) that provides design flexibility, depending on application needs, without compromising electrical performance • Low-PIM performance (160dBc @ 2x43dBm) enabling wireless service providers to build networks capable of superior performance • Custom, factory-made low-PIM cable jumper assemblies which eliminate the need for the customer to assemble in the field • IP68 rated to IEC 60529 standards making this connector ideal for use in outdoor environments • All factory jumpers are serialized and 100% electrical tested for rapid data traceability • Interface already adopted by radio and antenna OEMs; base station equipment will be deployed with new 4.3-10 connectors 	
	4.1/9.5	<ul style="list-style-type: none"> • Matches the performance and robustness of the DIN 7/16 and connector but in a smaller footprint • Ideal for applications such as Distributed Antenna Systems (DAS) and base stations which require low PIM and low attenuation • 50 Ohm nominal impedance designed to match both 1/2" and 3/8" cable • Custom, factory-made low-PIM cable jumper assemblies which eliminate the need for the customer to assemble in the field • IP68 rated with IEC 60529 standards making this connector ideal for use in outdoor environments • All factory jumpers are serialized and 100% electrical tested for rapid data traceability 	
	DIN 7/16	<ul style="list-style-type: none"> • Silver on tri-metal plating alloys delivering high conductivity and corrosion resistance; are non-magnetic for IMD • Easy-Hex coupling nut allowing for toolless applications • Custom, factory-made low-PIM cable jumper assemblies which eliminate the need for the customer to assemble in the field • IP68 rated with IEC 60529 standards making this connector ideal for use in outdoor environments • All factory jumpers are serialized and 100% electrical tested for rapid data traceability 	
	Type N	<ul style="list-style-type: none"> • Medium size, accommodating a wide range of medium to miniature-sized RG and corrugated cable in a rugged medium-sized design • Durable threaded coupling ensuring connector will not decouple in vibration intense applications • Custom, factory-made low-PIM cable jumper assemblies which eliminate the need for the customer to assemble in the field • IP68 rated with IEC 60529 standards making this connector ideal for use in outdoor environments • All factory jumpers are serialized and 100% electrical tested for rapid data traceability 	
	Boots	<ul style="list-style-type: none"> • Patent-pending weatherproof boots to protect connection in harsh weather; ideal for outdoor cellular sites • One-piece silicone boot design - no tooling needed to simplify field installation • Universal boot system to fit all panel receptacle connectors • Boot has 5 internal sealing points in addition to plug connector's internal O-ring • Complete assembly shipped – no loose components 	

Connector	4.3-10 DIN	4.1/9.5	DIN 7/16	Type N
Frequency Rating	DC to 12 GHz	DC to 14 GHz	DC to 8.3 GHz	DC to 11 GHz
RF Insertion Loss	$\leq 0.05 \times \sqrt{f}$ (GHz) dB	$\leq 0.05 \times \sqrt{f}$ (GHz) dB	$0.05 \sqrt{f}$ (GHz) dB Max	$< .05 + .04 \times \sqrt{f}$ (GHz) dB
RF Leakage	≥ 120 dB @ 1 GHz (Tool tightened)	≥ 128 dB @ 1 GHz	≥ 128 dB @ 1 GHz	> 100 dB up to 1 GHz
Recommended Mating Torque	5 - 8 Nm	10 Nm	25 - 30 Nm	6 in - lbs Maximum
Intermodulation	-166 dBc (2x43 dBm)	≤ 158 dBc (2x43 dBm)	≤ -155 dBm	-153dBc (2x43dBm)
Coupling Proof Torque	8 Nm	15 Nm	35 Nm	1.69Nm
Connector Durability	100 Cycles (minimum)	500 Cycles (minimum)	500 Cycles (minimum)	500 Cycles (minimum)
Sealing (Mated)	IP68	IP68	IP68	IP68

1/2" RF JUMPER CABLES

Molex jumper cables offer small bend radius, low attenuation and VSWR, excellent shielding and high PIM performance.



Product Characteristics

	Description	Type N Jumper Cable	DIN Jumper Cable
Electrical	Impedance	50Ω	
	Frequency Range	0~3GHz	
	Insertion Loss	≤ 0.2 dB+	
	Insertion Loss - Right Angle	≤ 0.16 dB+	
	VSWR	≤ 1.10	
	VSWR - Right Angle	≤ 1.15	
	Insulation	≤ -150 dBc	≤ -153 dBc
	Resistance	≤ 5000 MΩ	≤ 10000 MΩ
Environmental	Waterproof	IP67	
	Operating Temperature Range	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	
	Humidity	$\leq 95\%$	

www.molex.com/product/rf