



RF Connector Overview Guide

Linx Technologies offers a wide variety of SMA, MCX, MMCX and MHF radio frequency connector and cable assemblies. RF connectors and cables consist of miniature precision-machined mechanical components and clever designs with complex assembly which are necessary to minimize losses and reflections. This requries tight tolerances, quality surface finishing and proper choice of metals and insulators. By combining domestic design and quality with offshore connector manufacturing, Linx offers low loss connectors at very competitive prices for OEM customers.

Wireless made simple®

SMA Connectors

SMA (subminiature version A) connectors are high performance coaxial RF connectors with 50-ohm matching and excellent electrical performance up to 18GHz with insertion loss as low as 0.17dB. They also have high mechanical strength through their thread coupling. This coupling minimizes reflections and attenuation by ensuring uniform contact. SMA connectors are among the most popular connector type for OEMs as they offer high durability, low VSWR and a variety of antenna mating choices. In order to comply with FCC Part 15 requirements for non-standard antenna connectors, SMA connectors are also available in reverse polarity (RP-SMA).

CB Board	Termination SI	MA and RP-SMA	Connectors					
	Connector Type	Orientation	Mount	Style	Board Thickness	Body Finish	Polarity	Part Numbers
PENNA						Nickel	Standard	CONSMA001
		Straight	Through-hole	Receptacle		Gold	Otaridard	CONSMA001-G
	SMA001	Ottaignt	moughnoic	riccoptacio		Nickel	Reverse	CONREVSMA001
						Gold	ricvorsc	CONREVSMA001-G
						Nickel	Standard	CONSMA001-SMD
N	SMA001-SMD	Straight	Surface-mount	Receptacle		Gold	Otaridard	CONSMA001-SMD-G
	GIVIAGOT GIVID	Ottaignt	Curiace mount	riccoptacio		Nickel	Reverse	CONREVSMA001-SMD
						Gold	1 levelse	CONREVSMA001-SMD-0
					0.031 in		Standard	CONSMA003.031
1	SMA003	Ctroight	Edge	Dagantagla	0.031 III	Nickel	Reverse	CONREVSMA003.031
	SIVIAUU3	Straight	Edge	Receptacle	0.000 :-	Nickei	Standard	CONSMA003.062
					0.062 in		Reverse	CONREVSMA003.062
					0.024 :-		Standard	CONSMA006.031
			Ed. D. II beed		0.031 in		Reverse	CONREVSMA006.031
	SMA006	Straight	Edge, Bulkhead	Receptacle		Nickel	Standard	CONSMA006.062
The Contract of					0.062 in			CONREVSMA006.062
			Edge, Square Flange		0.002		Reverse	CONREVSMA006.062SC
					0.004 1		Standard	CONSMA013.031
Same	CMACTO	Charlet	Edea	Dlve	0.031 in	Nielsel	Reverse	CONREVSMA013.031
-	SMA013	Straight	Edge	Plug	0.000 :-	Nickel	Standard	CONSMA013.062
					0.062 in		Reverse	CONREVSMA013.062
						Nickel	01	CONSMA002
	0144000	D'ald Acada	The state had a	December		Gold	Standard	CONSMA002-G
1	SMA002	Right Angle	Through-hole	Receptacle		Nickel		CONREVSMA002
						Gold	Reverse	CONREVSMA002-G
						Nickel		CONSMA002-SMD
						Gold	Standard	CONSMA002-SMD-G
Christ	SMA002-SMD	Right Angle	Surface-mount	Receptacle		Nickel		CONREVSMA002-SMD
						Gold	Reverse	CONREVSMA002-SMD-
3-/-							Standard	CONSMA009.062
	SMA009	Right Angle	Edge	Receptacle	0.062 in	Nickel	Reverse	CONREVSMA009.062
	0144222	Right Angle,	Through-hole,	B		NP. C	Standard	CONSMA002-L
1	SMA002-L	Extended	Bulkhead	Receptacle		Nickel	Reverse	CONREVSMA002-L
W.	0144000	0	The state of	D		Nr. 1	Standard	CONSMA008
	SMA008	Straight, Extended	Through-hole	Receptacle		Nickel	Reverse	CONREVSMA008
							Standard	CONSMA003.031-L
16ra					0.031 in		Reverse	CONREVSMA003.031-L
The second	SMA003-L	Straight, Extended	Edge	Receptacle		Nickel	Standard	CONSMA003.062-L
					0.062 in		Reverse	CONREVSMA003.062-L

Cable Term	ination SMA a	nd RP-SMA	Connecctors					
	Connector Type	Orientation	Mount	Style	Cable Types	Body Finish	Polarity	Part Numbers
8	CMA007	Ctroight	Crimp End	Dhia	RG-174, RG-188A,	Nickel	Standard	CONSMA007
	SMA007	Straight	Crimp End	Plug	RG-316	Nickei	Reverse	CONREVSMA007
	CMACOZ DEO	Otunialet	Orinan Frad	Dhar	RG-58/58A/58C,	Nieles	Standard	CONSMA007-R58
	SMA007-R58	Straight	Crimp End	Plug	RG-141A	Nickel	Reverse	CONREVSMA007-R58
C TO	SMA007-R178	Otusialet	Orinan Frad	Dhar	DO 170 DO 100	Nieles	Standard	CONSMA007-R178
(20)	SMA007-R178	Straight	Crimp End	Plug	RG-178, RG-196	Nickel	Reverse	CONREVSMA007-R178
A	SMA012	Dight Apgle	Crima Fad	Dhia	RG-174, RG-188A,	Nickel	Standard	CONSMA012
	SIVIAU12	Right Angle	Crimp End	Plug	RG-316	Nickei	Reverse	CONREVSMA012
1	SMA012-R58	Right Angle	Crimp End	Plug	RG-58/58A/58C,	Nickel	Standard	CONSMA012-R58
-0	3WA012-N30	nigiti Arigie	Chinip End	Flug	RG-141A	MICKEI	Reverse	CONREVSMA012-R58
1	SMA012-R178	Diaht Analo	Crimp End	Plug	RG-178, RG-196	Nickel	Standard	CONSMA012-R178
San Si	3WA012-N176	Right Angle	Сппр Епа	Flug	ng-176, ng-190	MICKEI	Reverse	CONREVSMA012-R178
C' Parista	SMA011	Straight	Crimp End	Receptacle	RG-174, RG-188A,	Nickel	Standard	CONSMA011
	SIVIAOTT	Straigrit	Chinip End	песеріасіе	RG-316	MICKEI	Reverse	CONREVSMA011
	SMA011-R58	Straight	Crimp End	Receptacle	RG-58/58A/58C,	Nickel	Standard	CONSMA011-R58
	SWAOTT-100	Straight	Oninp End	Песеріасіе	RG-141A	INICKEI	Reverse	CONREVSMA011-R58
C Fine A	SMA011-R178	Straight	Crimp End	Receptacle	RG-178, RG-196	Nickel	Standard	CONSMA011-R178
	SWAOTT-TTTO	Straight	Oninp End	Песеріасіе	11G-176, 11G-196	INICKEI	Reverse	CONREVSMA011-R178
45	SMA005	Straight	Crimp End, Bulkhead	Receptacle	RG-174, RG-188A,	Nickel	Standard	CONSMA005
of the same	SIVIAOUS	Straight	Oninp End, Buiknead	Песеріасіе	RG-316	INICKEI	Reverse	CONREVSMA005
	SMA005-R58	Straight	Crimp End, Bulkhead	Receptacle	RG-58/58A/58C,	Nickel	Standard	CONSMA005-R58
and Comment	GIVI/1000 FIGU	Otraigrit	Onnip Ena, Bancicaa	Посоргасіс	RG-141A	TAICKCI	Reverse	CONREVSMA005-R58
	SMA005-R178	Straight	Crimp End, Bulkhead	Receptacle	RG-178, RG-196	Nickel	Standard	CONSMA05-R178
	GWAGGG TTT76	Otraigrit	Onnip Ena, Bancicaa	Посоргасіс	110 170,110 100	NICKCI	Reverse	CONREVSMA05-R178
Sto.	SMA014	Straight	Crimp End, Bulkhead,	Receptacle	RG-174, RG-188A,	Nickel	Standard	CONSMA014
PROT	GIVIAGT4	Otraigrit	Rear-Mount	Посоргасіс	RG-316	TAICKCI	Reverse	CONREVSMA014
- Alexander	SMA014-R58	Straight	Crimp End, Bulkhead,	Receptacle	RG-58/58A/58C,	Nickel	Standard	CONSMA014-R58
P. Alle	5.717.0141.00	Straight	Rear-Mount	1 1000ptable	RG-141A	NIONO	Reverse	CONREVSMA014-R58
Seles .	CMA014 D170	Oturalisabet	Crimp End, Bulkhead,	Danastasti	DO 170 DO 100	Nieles	Standard	CONSMA014-R178
P	SMA014-R178	Straight	Rear-Mount	Receptacle	RG-178, RG-196	Nickel	Reverse	CONREVSMA014-R178
- OFF	014104-		Crimp End, Bulkhead,		RG-174, RG-188A,		Standard	CONSMA015
-1	SMA015	Straight	Front-Mount	Receptacle	RG-316	Nickel	Reverse	CONREVSMA015
-850	014045 5455	01	Crimp End, Bulkhead,	B	DO 170 DO 105	NE L	Standard	CONSMA015-R178
Cal Barre	SMA015-R178	Straight	Front-Mount	Receptacle	RG-178, RG-196	Nickel	Reverse	CONREVSMA015-R178

SMA Connector General Specifications

Materials		
Connector Part	Material	Finish
Dadias	Brass	Nickel or Gold
Bodies	Stainless Steel (Special Order)	Passivated or Gold
0	Male: Brass	0.14
Center Contact	Female: Beryllium Copper	Gold
Insulator	PTFE	N/A
Crimp Ferrule	Annealed Copper	Nickel or Gold

Electrical			
Electrical Data	Detail		
Impedance	50-ohm		
Fraguenay Banga	Flexible cable: 0-1	2.4GHz	
Frequency Range	Semi-rigid cable: 0	⊢18GHz	
Insertion Loss	0.04dB max. √f Gl	Hz (straight)	
insertion Loss	0.06dB max. √f Gl	Hz (right angle)	
VSWR: f(GHz)	RG-178/U ST: 1.20+0.025f RA: 1.20+0.03f	RG-174, 316/U ST: 1.15+0.02f RA: 1.15+0.03f	RG-58, 141, 142, 223/U ST: 1.10+0.01f RA: 1.15+0.02f





MCX Connectors

MCX (micro coaxial) connectors are subminiature RF connectors that offer strong electrical performance in a smaller size, compared to SMAs and SMBs. The outer diameter of the plug is approximately 2.6 mm or 0.140 inch. Linx MCX connectors are available at 50-ohms and operate up to 6GHz at less than 0.2dB insertion loss. Their small size and snap-on connection is ideal for dense packaging such as those in consumer products, GPS and automotive application.

PCB Board	Termination MC	CX and RP-N	MCX Connecto	rs				
	Connector Type	Orientation	Mount	Style	Board Thickness	Body Finish	Polarity	Part Numbers
To	MCX001	Straight	Through-hole	Receptacle		Gold	Standard	CONMCX001
							Standard	CONMCX001-SMD
	MCX001-SMD	Straight	Surface-mount	Receptacle		Gold	Reverse	CONREVMCX001-SMD
-	MCX003	Ctroight	Edge	Decented	0.031 in	Gold	Ctondord	CONMCX003.031
	IVICAUU3	Straight	Edge	Receptacle	0.062 in	Gold	Standard	CONMCX003.062
4	MCX002	Right Angle	Through-hole	Receptacle		Gold	Standard	CONMCX002
	MCX002-SMD	Right Angle	Surface-mount	Receptacle		Gold	Standard	CONMCX002-SMD
10	IVIOXOUZ-GIVID	Tilgrit Arigie	Sunace-mount	Песергасіе		dold	Reverse	CONREVMCX002-SMD
	140/000	Straight,			0.031 in		0	CONMCX003.031-L
	MCX003-L	Extended	Edge	Receptacle	0.062 in	Gold	Standard	CONMCX003.062-L

Cable Term	nination MCX ar	nd RP-MCX	Connectors					
	Connector Type	Orientation	Mount	Style	Cable Types	Body Finish	Polarity	Part Numbers
Str. Williams	MCX007	Ctualabt	Crimp End	Dlug	RG-174, RG-188A.	Gold	Standard	CONMCX007
	IVICAUU7	Straight	Crimp End	Plug	RG-316	Gold	Reverse	CONREVMCX007
	MCX007-R178	Straight	Crimp End	Plug	RG-178, RG-196	Gold	Standard	CONMCX007-R178
	MCX012	Right Angle	Crimp End	Plug	RG-174, RG-188A, RG-316	Gold	Standard	CONMCX012
	MCX012-R178	Right Angle	Crimp End	Plug	RG-178, RG-196	Gold	Standard	CONMCX012-R178
W -	MCX011	Straight	Crimp End, Bulkhead	Receptacle	RG-174, RG-188A,	Gold	Standard	CONMCX011
	WOXOTT	Ottaignt	Oninp End, Buildicad	riccoptacio	RG-316	dola	Reverse	CONREVMCX011
	MCX011-R178	Straight	Crimp End, Bulkhead	Receptacle	RG-178, RG-196	Gold	Standard	CONMCX011-R178
D	MCX005	Ctroight	Crime Fool Bulldood	Decented	RG-174,	Cold	Standard	CONMCX005
B	CUUADIVI	Straight	Crimp End, Bulkhead	Receptacle	RG-188A, RG-316	Gold	Reverse	CONREVMCX005
The	MCX005-R178	Straight	Crimp End, Bulkhead	Receptacle	RG-178, RG-196	Gold	Standard	CONMCX005-R178



MMCX (micro-miniature coaxial) connectors are similar to the MCX but smaller and approximately one third lighter. MMCX connectors are matched to 50-ohms and operate up to 6GHz with less than 0.3dB insertion loss. The connectors have a snap locking mechanism which allows 360° rotation. Because of their small size, MMCX connectors are popular in consumer products, PCS devices and GPS applications.

PCB Boar	d Termination MMCX	Connectors					
	Connector Type	Orientation	Mount	Style	Body Finish	Polarity	Part Numbers
10	MMCX001	Straight	Through-hole	Receptacle	Gold	Standard	CONMMCX001
	MMCX001-SMD	Straight	Surface-mount	Receptacle	Gold	Standard	CONMMCX001-SMD
W. S.	MMCX002	Right Angle	Through-hole	Receptacle	Gold	Standard	CONMMCX002
1	MMCX002-SMD	Right Angle	Surface-mount	Receptacle	Gold	Standard	CONMMCX002-SMD

Cable Tern	nination MMCX Co	nectors						
	Connector Type	Orientation	Mount	Style	Cable Types	Body Finish	Polarity	Part Numbers
1	MMCX007	Straight	Crimp End	Plug	RG-174, RG-188A, RG-316	Gold	Standard	CONMMCX007
and the second	MMCX007-R178	Straight	Crimp End	Plug	RG-178, RG-196	Gold	Standard	CONMMCX007-R178
	MMCX012	Right Angle	Crimp End	Plug	RG-174, RG-188A, RG-316	Gold	Standard	CONMMCX012
	MMCX012-R178	Right Angle	Crimp End	Plug	RG-178, RG-196	Gold	Standard	CONMMCX012-R178
6	MMCX011	Straight	Crimp End	Receptacle	RG-174, RG-188A, RG-316	Nickel	Standard	CONMMCX011
	MMCX011-R178	Straight	Crimp End	Receptacle	RG-178, RG-196	Nickel	Standard	CONMMCX011-R178

MCX and MMCX Connector General Specifications

Materials		
Connector Part	Material	Finish
Bodies	Brass	Nickel or Gold
Center Contact	Male: Brass	Gold
Center Contact	Female: Beryllium Copper	Gold
Insulator	PTFE	N/A
Crimp Ferrule	Annealed Copper	Nickel or Gold

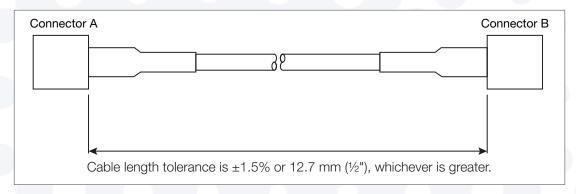
Electrical			
Electrical Data	Detail		
Impedance	50-ohm		
Frequency Range	0-6GHz		
Innertian Loss (MCV)	0.1dB max. (straight	t)	
Insertion Loss (MCX)	0.2dB max. (right ar	ngle)	
Innertian Loss (MMCV)	0.2dB max. at 1GHz	z (straight)	
Insertion Loss (MMCX)	0.3dB max. at 1GHz	z (right angle)	
	M	CX	MMCX
VSWR f(GHz)	RG-178/U ST: 1.17+0.04f RA: 1.07+0.06f	RG-316/U ST: 1.13+0.04f RA: 1.07+0.04f	ST: 1.3 max. RA: 1.5 max.





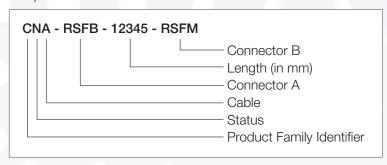
Cable Assembly Capabilities

Cable Length Tolerance



Cable Assembly Part Numbering System

Our part numbers are structured as follows:



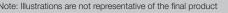
Cable Type	D	l				At	tenuation (dB/100M)			
Code	Description	Impedance	100MHz	200MHz	400MHz	700MHz	900MHz	1GHz	1.8GHz	2.45GHz	5.2GHz	5.8GHz
А	RG-174	50Ω	27.6	41	62.3	88.6	101/8					
В	RG-178	50Ω	52.49		108.27			170.61				
С	RG-58	50Ω	14.8	22.3	32.8	45.9	52.8					
D	RG-58LL	50Ω		4.66	6.32	8.45	9.67	10.2				
E	RG-316	50Ω	36.09		68.9			124.68				
I	1.13mm	50Ω							2.2	2.6	3.9	4.3

	Cable Status
n	Status Code
	С
	S
	N
k	N

Connector Specifications						
Series	Impedance	Frequency Range	Insertion Loss			
SMA & RP-SMA	50Ω	0-12.4GHz	0.04dB max			
MCX & RP-MCX	50Ω	0–6GHz				
MMCX	50Ω	0–6GHz				

Connector Choices for Cable Assemblies

Type	Style	Orientation	Finish	Polarity	Connector Code		
			Nickel	Standard	SMAM		
		Straight		Reverse	RPSM		
		Straight	Gold	Standard	SGAM		
	5.			Reverse	RGSM		
	Plug		Nickel	Standard	SAMR		
		Right Angle		Reverse	RSMR		
			Gold	Standard	SGMR		
				Reverse	RGMR		
	Receptacle	Straight	Nickel	Standard	SMAF		
				Reverse	RPSF		
			Gold	Standard	SGAF		
				Reverse	RGSF		
SMA	Receptacle, Rear-Mount,		Nickel	Standard	SAFB		
				Reverse	RSFB		
	Bulkhead	Straight		Standard	SGFB		
			Gold	Reverse	RGFB		
	Receptacle, Rear-Mount, Sealed, Bulkhead		Nickel	Standard	SAFI	النو	
				Reverse	RSFI		
		Straight		Standard	SGFI		
			Gold	Reverse	RGFI		
			Nickel	Standard	SAFE		
	December 1 Front Mount			Reverse	RSFE		
	Receptacle, Front-Mount, Sealed, Bulkhead	Straight	Gold	Standard	SGFE		
				Reverse	RGFE		
	Plug			Standard	MCXM		
		Straight	Gold	Reverse	RPXM	-	
		Right Angle	Gold	Standard	MXMR		
				Reverse	RXMR	THE REAL PROPERTY.	
MCX	Receptacle	Straight	Gold	Standard	MCXF	£356	
				Reverse	RPXF	A STATE OF THE PARTY OF THE PAR	
	Receptacle, Rear-Mount, Bulkhead	Straight	Gold	Standard	MXFB	do	
				Reverse	RXFB		
				ricverse	TINID	T	
MMCX	Plug	Straight	Gold	Standard	MMXM		
		Right Angle	Gold	Standard	MMMR		
	Receptacle	Straight	Gold	Standard	MMXF		
	Receptacle, Rear-Mount, Bulkhead	Straight	Gold	Standard	MMFB		
MHF / U.FL	Plug	Right Angle	Gold	Standard	UFFR		
traight Cut	N/A	N/A	N/A	N/A	STCT		
Strip & Tin	N/A	N/A	N/A	N/A	STTN		









Cable Customization Capabilities

Properly stripping a coaxial cable and attaching it to the connector requires special fixtures and experience. Unlike digital cables, a small deviation from the ideal attachment may yield key parameters that are out of specification. Prudent customers often buy pre-built cables from Linx to benefit from Linx's quality systems, fixtures and RF expertise. In-house cable finishing allows Linx to quickly deliver a variety of cable lengths and connector combinations.

Linx Technologies Headquarters

Linx corporate headquarters are located in a beautiful custom-built facility in Merlin, Oregon, which is in the Rogue Valley near Grants Pass and the Rogue River.



Linx Technologies is continually striving to improve the quality and function of its products. For this reason, we reserve the right to make changes to our products without notice. The information contained in this Data Guide is believed to be accurate as of the time of publication. Specifications are based on representative lot samples. Values may vary from lot-to-lot and are not guaranteed. "Typical" parameters can and do vary over lots and application. Linx Technologies makes no guarantee, warranty, or representation regarding the suitability of any product for use in any specific application. It is Customer's responsibility to verify the suitability of the part for the intended application. At Customer's request, Linx Technologies may provide advice and assistance in designing systems and remote control devices that employ Linx Technologies RF products, but responsibility for the ultimate design and use of any such systems and devices remains entirely with Customer and/or user of the RF products.

Some customers may want Linx radio frequency ("RF") products to control machinery or devices remotely, including machinery or devices that can cause death, bodily injuries, and/or property damage if improperly or inadvertently triggered, particularly in industrial settings or other applications implicating life-safety concerns ("Life and Property Safety Situations").

NO OEM LINX REMOTE CONTROL OR FUNCTION MODULE SHOULD EVER BE USED IN LIFE AND PROPERTY SAFETY SITUATIONS. No OEM Linx Remote Control or Function Module should be modified for Life and Property Safety Situations. Such modification cannot provide sufficient safety and will void the product's regulatory certification and warranty.

Customers may use our (non-Function) Modules, Antenna and Connectors as part of other systems in Life Safety Situations, but only with necessary and industry appropriate redundancies and in compliance with applicable safety standards, including without limitation, ANSI and NFPA standards. It is solely the responsibility of any Linx customer who uses one or more of these products to incorporate appropriate redundancies and safety standards for the Life and Property Safety Situation application.

Copyright © 2014 Linx Technologies

Phone: +1 541 471 6256 Oregon HQ Fax: +1 541 471 6251 159 Ort Lane www.linxtechnologies.com Merlin, OR 97532

