Test Pro

Test and measurement cable assemblies

RADIALL
The next conneXion

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COMPANY PROFILE

*Technical information and sales contacts are available at : **www.radiall.com***

Simply Your Best Connection

Radiall is a global leader in the design, development and manufacturing of leading edge interconnect solutions. Dedicated to understanding its customers' needs since 1952, Radiall has earned the reputation of being "the best of the best" in engineering ingenuity by providing a constant flow of creative system solutions serving the telecommunications, aerospace, defense, instrumentation, automotive, industrial, medical and broadcast markets.

The Best End-to-End Interconnect Solutions

We offer an extensive range of solutions that support the most demanding signal transmission applications. 4G wireless infrastructure, active array radars, IED detection, electrical wiring in aircrafts, soldier tactical radios, in-vehicle communications networks, and magnetic resonance imaging systems are just a few of the complex applications that we support.

- RF coaxial connectors
- Fiber optic connectors and transceivers
- Coaxial and fiber optic cable assemblies and harnesses
- High frequency microwave components
- Coaxial switches, including the smallest and most reliable SPDT relay
- Multipin rectangular connectors
- Rack and panel connectors
- Antennas for tactical networks, aerospace and instrumentation

Best Value-added Services

- **Collaboration:** We work closely with your engineers to understand your business, your technical needs, and your budgetary issues
- **Wide Product Range:** We manage our product lines throughout the entire lifecycle, in order to offer you a wide selection of standard products at an affordable cost
- **Custom Products:** We can custom tailor products to specific equipment and application needs;
- **Global Presence:** We're everywhere you need us, with worldwide sales, engineering support, R&D in North America, Europe, and Asia, and manufacturing facilities strategically located in the United States, Mexico, France, India, and China
- **Responsive Support and Service:** From the design stage, planning to post-installation support, we're with you at every step, whether you need sales support or engineering expertise
- **On-time Delivery:** We support your logistical needs so you get the products when and where you need them
- **Warranty:** We proudly stand behind our products

Certifications and Environmental

ISO 9001 Certified
AS/EN/JISQ9100-ISOTS 16949-ISO-14001

Radiall is ISO 9001: 2008 certified and dedicated to continuous improvement programs that have resulted in also being AS9100, TS16949 and ISO 14001 certified. In addition, Radiall is committed to investing in its people, future technologies and the environment, such as being RoHS (Restriction of Hazardous Substances) and REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances) compliant.

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INTRODUCTION

The TestPro product range is dedicated to **Test and Measurement applications** requiring excellent electrical performance, high mechanical endurance and excellent resistance to wear and corrosion.

We offer 2 product categories to meet your needs:

- **"Phase stable TestPro"** are suitable for test benches in production or labs, due to their long life and stability in dynamic use. Test cable assemblies are intended for daily use in components and assembly shops, test labs and automatic test equipment applications.

They differ from standard cable assemblies in the fact that they are especially designed for applications that require repeated connection/disconnection procedures, strenuous flexing situations and applications where phase, loss and VSWR stability becomes an issue.

- **"Ultra low loss"** allow the use of long length cables with remote test stations and anechoic chambers. Their high stability with temperature makes them easy to use in temperature chambers. They are also suitable for high power applications.

Our TestPro product range is designed to operate in the DC - 40 GHz frequancy range depending on connector and cable choice.

Optional protective jacket, offer different armor level.

Our **"ProJack"** is excellent for all defense systems tests running outdoors.

All components are designed and manufactured by Radiall in facilities operated under ISO9001-V2000/ASN9100 quality standards.

ONLINE WEBTOOL FOR QUICK SERVICE

To access our online tools and build the desired cable assembly, goto **www.radiall.com/cableassembly**

Select our "Test & Measurement" tool for TestPro cable assemblies.

This tool enables you to select from a list of standard assembly lengths, part numbers or to build your own TestPro assembly by selecting cable and connectors to meet your need. The TestPro tool also gives the performance of the desired cable assembly.

- Select standard assembly lengths or
- build your assembly
- calculate performance

TestPro

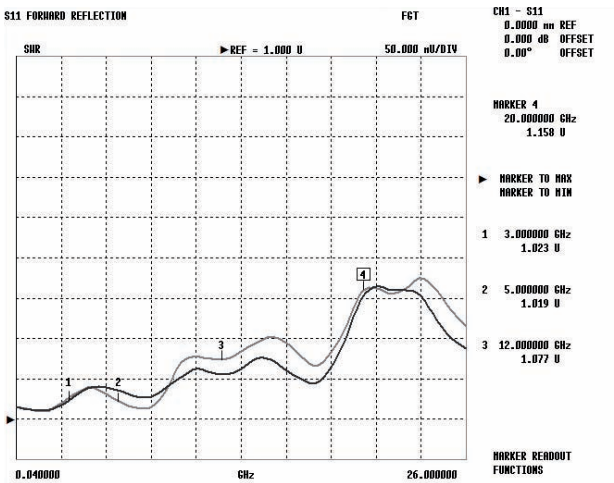
CABLE DESIGN and MANUFACTURING

The TestPro cable range benefits from Radiall's 30 years of experience in manufacturing high tech microwave cable for the military and aerospace markets. The TestPro cables were designed to meet test and measurement requirements.
Manufacturing is attained on Radiall's own design manufacturing machines.
Low density PTFE tape wrapping is the heart of our process. It elevates our Ultra Low Loss TestPro cable to the position of best performance in the market.
Our mastery in high precision multilayer braiding and wrapping makes the TestPro cable range stable over thousands of bending life cycles compared to the competition.

5000 MATING CYCLES GUARANTEED

TestPro cable assemblies for test applications were developed using new highly ruggedized stainless steel connectors. Our TestPro connectors are extremely robust. The combination of higher grade stainless steel and a unique attachment method offers a very reliable product over multiple matings.

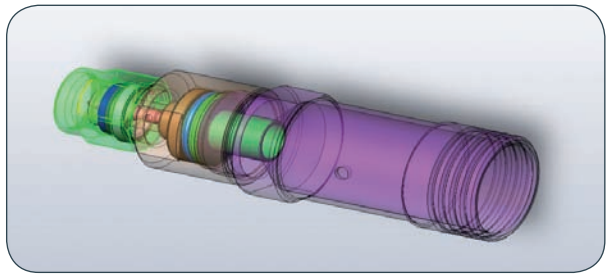
Performance after 5,000 matings



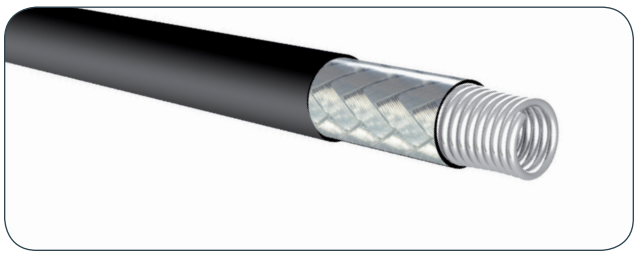
- Low contact resistance variation < 0.3 mΩ
- Very stable VSWR 1.11 @ 18 GHz

CONNECTOR ATTACHMENT

The connector attachment is the main weakness, when using standard cable assemblies in test and measurement applications. Radiall TestPro connectors are designed with a unique attachment process which elevates the assembly ruggedness, provides high electrical stability, and a very long life.



ARMOR OPTION



APPLICATION NOTE

Main benefits:
- high mechanical protection (resistance to crush, traction, abrasion, etc.)
- high flexibility
- anti-torque
- strain relief
- anti-kinking action
- secured watertightness when used with compound chamber

Radiall p/n: G940RP10 - G941RP10

• construction

	Material
Spring	stainless steel
Braid	stainless steel
Jacket	black PU

• mechanical characteristics

	For TestPro 4.2 and TestPro 5	For TestPro 8
Outer dia. (max)	11 mm (0.433 in.)	15 mm (0.590 in.)
Maximum weight	190 g/m (57.6 g/ft)	340 g/m (103 g/ft)
Min. bend radius	equal to cable bend radius	
Crush resistance	2 500 N / 100 mm	
Tensile strength	900 N	

• environmental characteristics

Temperature*	-55 / +100 ° C (-67 / +212° F)
Fire resistance	yes (FAR 25 853)
Halogen-free jacket	no

* operating temperature range

In many applications, specific assemblies are needed. The Radiall TestPro range is available in standard or custom lengths and configurations. Use the following pages to select a standard part number or make your choice of cable and connectors to meet your needs and send us your request for quotation.

HOW TO ORDER

Select the right TestPro cable.

- TestPro 3 and TestPro 4.2 “Phase stable” are suitable for test benches in production or labs, due to its long life and great stability in dynamic use.
- TestPro 5 and TestPro 8 “Ultra low loss” allow the use of long length cables with remote test stations and anechoic chambers. Their high stability with temperature makes them easy to use in temperature chambers. They are also suitable for high power applications.

Select armor option for reinforced cable assemblies.

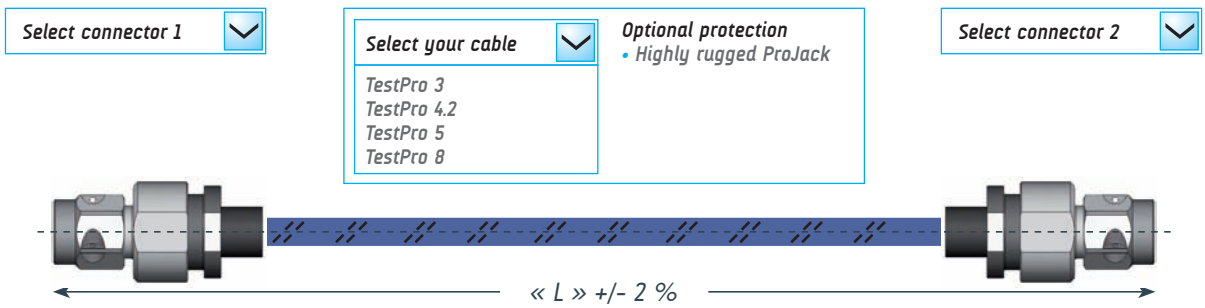
TestPro 3 is internaly armored. For TestPro 4.2, TestPro 5 and TestPro 8 optional protective jackets, “ProJack” offers high armor level. “ProJack” is excellent for all defense systems tests running outdoors.
See detailed protective jacket characteristics in page 6.

Select connectors.

Select the right connectors compatible with your choice of TestPro cables.

Send quote requests to your Radiall sales contact.

You may also use our cable assembly builder at www.radiall.com



MAIN CHARACTERISTICS

PHASE STABLE BENCH TEST CABLE ASSEMBLY

Properties	TestPro 4.2	TestPro 3 / TestPro 3 Low Profile
Frequency range	DC - 20 GHz	DC - 26.5 GHz and DC- 40 GHz
Impedance	50 Ω ± 2 Ω	50 Ω ± 1 Ω
IL (dB/m)	1.90 @ 18 GHz	2.41 @ 26.5 GHz - 3.11 @ 40 GHz
IL (dB/ft)	0.58 @ 18 GHz	0.73 @ 26.5 GHz - 0.94 @ 40 GHz
Phase with flexure stability	2° @ 18 GHz	2° @ 26.5 GHz - 5° @ 40 GHz
Amplitude stability (dB)	< 0.05 @ 18 GHz	< 0.1 @ 40 GHz
Shielding effectiveness	-110 dB min @ 1 GHz	-110 dB min @ 1 GHz
Crush resistance	135 lb/linear in.	260 lb/linear in. (*)
Minimum bend radius	25 mm (1 in.)	25 mm (1 in.)
Temperature (°C)	-55 / + 105 °C	-55 / + 125 °C
Connectors	SMA, N, TNC, PC7	SMA3.5, SMA2.9 (K), NMD2.9, TVAC2.9, 2.4MM
Flexure life cycle	10,000	20,000
Mating cycles durability	5,000	5,000
Armor	Available	Integrated
ROHS / REACH	Yes	Yes

(*) TestPro 3 low profile non-armored version is 23 lb/linear in.

Application note

TestPro cables are designed specifically for testing and measurement and combine outstanding electrical performance with a specially designed protection system. These ruggedized assemblies offer excellent durability while remaining exceptionally flexible. The unique connector attachment system and strong cable structure provide high tensile stress resistance to the entire assembly.

Key features & benefits

- Phase and loss stable with flexure
- Crush torque and tensile resistant
- Flexible design
- Long service life
- Longer calibration intervals
- Easy to configure to DUT

Standard assembly lengths available 24", 36", and 72".
Custom cable lengths are available with short lead times.

Typical applications include: test labs, production floor testing, anechoic chambers, thermal vacuum chambers, and nearfield scanners.

All TestPro cable assemblies are delivered in individual packaging and corresponding test report.

STANDARD ASSEMBLY LENGTHS

PHASE STABLE TEST BENCH CABLE ASSEMBLIES

Part number	Operating frequency	Connectors		Length	Attenuation-Typ. @2GHz - @18GHz	VSWR-Typ. @18GHz
R288940034	DC - 18 GHz	SMA male	SMA male	24 in. / 61 cm	0.47 dB - 1.51 dB	1.20
R288940060	DC - 18 GHz	SMA male	SMA female	24 in. / 61 cm	0.47 dB - 1.51 dB	1.20
R288940001	DC - 18 GHz	SMA male	SMA male	36 in. / 91 cm	0.64 dB - 2.14 dB	1.20
R288940002	DC - 18 GHz	SMA male	SMA male	48 in. / 122 cm	0.83 dB - 2.79 dB	1.20
R288940003	DC - 18 GHz	SMA male	SMA male	72 in. / 183 cm	1.19 dB - 4.07 dB	1.20
R288940035	DC - 18 GHz	SMA male	N Type (*)	24 in. / 61 cm	0.47 dB - 1.51 dB	1.25
R288940004	DC - 18 GHz	SMA male	N Type (*)	36 in. / 91 cm	0.64 dB - 2.14 dB	1.25
R288940005	DC - 18 GHz	SMA male	N Type (*)	48 in. / 122 cm	0.83 dB - 2.79 dB	1.25
R288940006	DC - 18 GHz	SMA male	N Type (*)	72 in. / 183 cm	1.19 dB - 4.07 dB	1.25
R288940007	DC - 18 GHz	N Type (*)	N Type (*)	36 in. / 91 cm	0.64 dB - 2.14 dB	1.25
R288940008	DC - 18 GHz	N Type (*)	N Type (*)	48 in. / 122 cm	0.83 dB - 2.79 dB	1.25
R288940009	DC - 18 GHz	N Type (*)	N Type (*)	72 in. / 183 cm	1.19 dB - 4.07 dB	1.25
R288940010	DC - 18 GHz	PC7	PC7	36 in. / 91 cm	0.64 dB - 2.14 dB	1.30
R288940011	DC - 18 GHz	PC7	PC7	48 in. / 122 cm	0.83 dB - 2.79 dB	1.30
R288940013	DC - 18 GHz	PC7	SMA male	36 in. / 91 cm	0.64 dB - 2.14 dB	1.30
R288940014	DC - 18 GHz	PC7	SMA male	48 in. / 122 cm	0.83 dB - 2.79 dB	1.30
R288940016	DC - 18 GHz	PC7	N Type (*)	36 in. / 91 cm	0.64 dB - 2.14 dB	1.30
R288940017	DC - 18 GHz	PC7	N Type (*)	48 in. / 122 cm	0.83 dB - 2.79 dB	1.30
0100900900914GX	DC - 18 GHz	TNC male	TNC male	36in. / 91 cm	0.70 dB - 2.34 dB	1.30

(*) Quick turn N Type male connector. All TestPro cable assemblies are delivered in individual packaging with attached test report.

VSWR

Maximum VSWR	0-4 GHz		4-8 GHz		8-12.4 GHz		12.4-18 GHz	
	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB
2 x SMA	1.12	25	1.20	21	1.20	21	1.25	19
2 x N	1.15	23	1.25	19	1.25	19	1.30	18
2 x PC7	1.25	19	1.30	18	1.30	18	1.35	16

This table gives value for assembly lengths between 200 to 5000 mm (8 to 196 in.)

TEMPERATURE DERATING

Attenuation at X°C = Attenuation (20°C) x (1 + (X - 20) x θ)

Ex: θ = 0.002 for copper and silver

CHARACTERISTICS

CONSTRUCTION / DIMENSIONS

	Material
Center conductor	solid SPCC[1]
Dielectric	solid PTFE[2]
Inner shield	flat SPC tape
Interlayer	Aluminum-Polyimide tape
Outer shield	SPC braid
Jacket	clear FEP[3]
Outer diameter	4.81 mm (0.190 inches)

[1] SPCC = Silver Plated Copper-Clad Steel
[2] PTFE = Poly-TetraFluoroEthylene
[3] FEP = Fluorinated Ethylene Propylene

ELECTRICAL CHARACTERISTICS

Characteristic impedance	50 ohms ± 2 ohms	
Operating frequency range	DC - 20 GHz	
Cut-off frequency	34 GHz	
Screening effectiveness	> 100 dB (at 18 GHz)	
Velocity of propagation	71 %	
Propagation time	4.75 ns / m	1.45 ns / ft
Capacitance	95 pF / m (at 1 GHz)	29 pF / ft (at 1 GHz)
Insulation resistance	> 3 x 10^5 MOhm / m	
Nominal phase	1645 ° / m / GHz	
Phase stability with bending*	< 0.17° / 360° / GHz (at 18 GHz)	
Attenuation stability with bending*	< 0.015 dB (at 18 GHz)	
Attenuation stability with shaking	< 0.01 dB/m (at 18 GHz)	

* = the cable is coiled up 10 times onto a mandrel of 100 mm (3.94") diameter.

MECHANICAL CHARACTERISTICS

Maximum weight	60g / m	18.3g / ft
Recommend. min. bend radius	25 mm	0.98 inch
Crush resistance	> 2300N / 100 mm	

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range*	-55 / +200° C	-67 / +392° C
Fire resistance	yes	
Halogen-free jacket	no	

* cable alone. Cable assembly operating temperature range is -55 / +105°C (-67 / + 221°F)

APPLICATION NOTE

TestPro 4.2 is a high frequency microwave cable that delivers good attenuation characteristics. This low loss triple-shielded cable provides the best combination of low attenuation and VSWR/loss/phase stability, when compared to similar size flexible cables. The TestPro 4.2 rugged structure is perfectly adapted for dynamic applications such as laboratory measurements when assembled with TestPro connectors.

FREQUENCY / ATTENUATION (typ.) / CW MAX POWER (*)

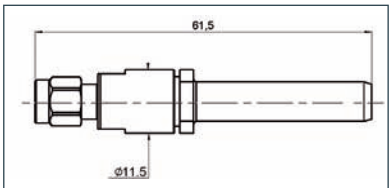
GHz	dB / m	dB / ft	Watts
1.0	0.41	0.12	550
2.0	0.60	0.18	295
4.0	0.87	0.26	210
8.0	1.29	0.39	150
12.4	1.67	0.51	120
18.0	2.10	0.64	95
20.0	2.24	0.68	80
Attenuation calculation (dB/m)	(0.384 x $\sqrt{F}$ GHz) + (0.026 x F GHz)		

(*) = CW max power calculated at sea level / 40°C and VSWR 1:1
(Power ratings may be limited by the connector type. Please contact us for specific needs).
Note : typical attenuation for a couple of connectors (dB) = 0.0447 x $\sqrt{F}$ (GHz) + 0.04

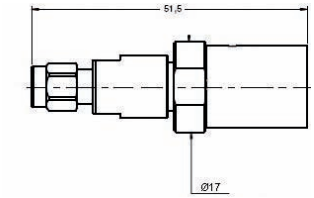
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

SMA SERIES

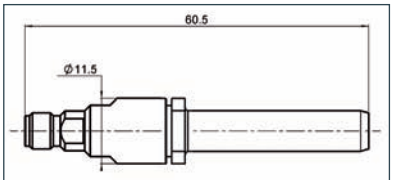


Designation	Straight Plug
Item	M125064C00
Max. Freq	20 GHz

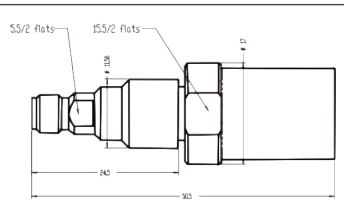


Designation	Straight Plug for ProJack
Item	M125064C01
Max. Freq	20 GHz

SMA Series characteristics:
Voltage withstanding 750 Vrms
Connector material is stainless steel.
Finish is passivated
Nominal coupling nut torque si 110 N
Recommended torque wrench for plugs:
R282320000 / 8 mm / 80-120 Ncm

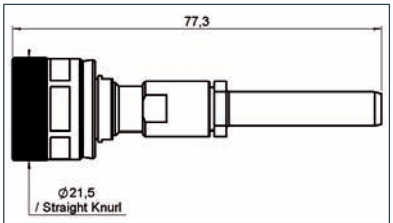


Designation	Straight Jack
Item	M125207C00
Max. Freq	20 GHz

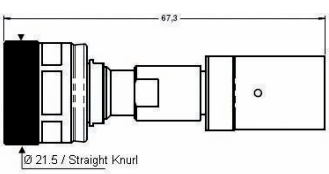


Designation	Straight Jack for ProJack
Item	M125207C01
Max. Freq	20 GHz

PC7 SERIES



Designation	Straight Plug
Item	M151064C00
Max. Freq	18 GHz



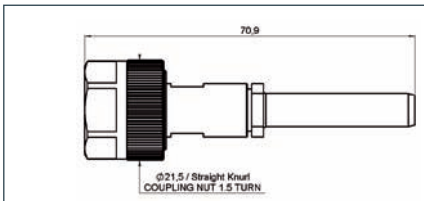
Designation	Straight Plug for ProJack
Item	M151064C01
Max. Freq	18 GHz

PC7 Series characteristics:
Voltage withstanding 750 Vrms
Connector material is stainless steel.
Finish is passivated

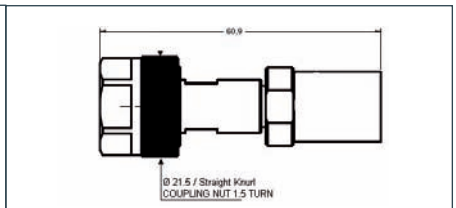
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

N SERIES



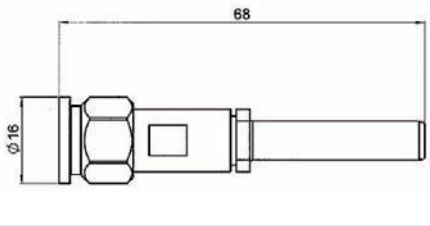
Designation	Straight Plug
Item	M163064C00
Max. Freq	18 GHz



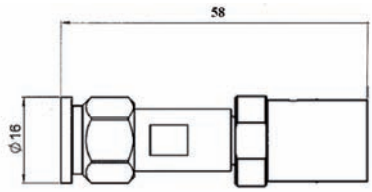
Designation	Straight Plug For ProJack
Item	M163064C01
Max. Freq	18 GHz

N Series characteristics:
Voltage withstanding 750 Vrms
Quick turn (1.5 full rotation to mate)
Connector material is stainless steel.
Finish is passivated.
Nominal coupling nut torque is 400 N
Recommended torque wrench:
R282303000 / 19 mm / 160 Ncm

TNC SERIES



Designation	Straight Plug
Item	M143064C00
Max. Freq	18 GHz



Designation	Straight Plug For ProJack
Item	M143064C01
Max. Freq	18 GHz

TNC Series characteristics:
Voltage withstanding 1500 Vrms
Connector material is stainless steel.
Finish is passivated.
Nominal coupling nut torque is 330 N
Recommended torque wrench:
R282300000 / 14 mm / 265 Ncm

STANDARD ASSEMBLY LENGTHS

PHASE STABLE TEST BENCH CABLE ASSEMBLIES

Part number	Operating frequency	Connectors		Length	Attenuation-Typ. @2GHz - @Max F(GHz)	VSWR-Typ. @Max F(GHz)
1801171170610KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 male	24 in. / 61 cm	0.44 dB - 1.44 dB	1.27
1801171180610KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 female	24 in. / 61 cm	0.44 dB - 1.44 dB	1.27
1801171170914KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 male	36 in. / 91 cm	0.61 dB - 2.02 dB	1.27
1801171180914KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 female	36 in. / 91 cm	0.61 dB - 2.02 dB	1.27
1801171171219KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 male	48 in. / 122 cm	0.78 dB - 2.61 dB	1.27
1801171181219KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 female	48 in. / 122 cm	0.78 dB - 2.61 dB	1.27
1801171171829KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 male	72 in. / 183 cm	1.12 dB - 3.78 dB	1.27
1801171181829KE	DC - 26.5 GHz	SMA 3.5 male	SMA 3.5 female	72 in. / 183 cm	1.12 dB - 3.78 dB	1.27
1800920920610PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 male	24 in. / 61 cm	0.44 dB - 1.76 dB	1.35
1800920930610PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 female	24 in. / 61 cm	0.44 dB - 1.76 dB	1.35
1800920920914PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 male	36 in. / 91 cm	0.61 dB - 2.46 dB	1.35
1800920930914PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 female	36 in. / 91 cm	0.61 dB - 2.46 dB	1.35
1800920921219PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 male	48 in. / 122 cm	0.78 dB - 3.19 dB	1.35
1800920931219PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 female	48 in. / 122 cm	0.78 dB - 3.19 dB	1.35
1800920921829PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 male	72 in. / 183 cm	1.12 dB - 4.62 dB	1.35
1800920931829PJ	DC - 40 GHz	SMA 2.9 male	SMA 2.9 female	72 in. / 183 cm	1.12 dB - 4.62 dB	1.35
1800940920914PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 male	36 in. / 91 cm	0.61 dB - 2.46 dB	1.35
1800940930914PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 female	36 in. / 91 cm	0.61 dB - 2.46 dB	1.35
1800940921219PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 male	48 in. / 122 cm	0.78 dB - 3.19 dB	1.35
1800940931219PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 female	48 in. / 122 cm	0.78 dB - 3.19 dB	1.35
1800940921829PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 male	72 in. / 183 cm	1.12 dB - 4.62 dB	1.35
1800940931829PJ	DC - 40 GHz	NMD 2.9	SMA 2.9 female	72 in. / 183 cm	1.12 dB - 4.62 dB	1.35

2.4MM connectors available soon, please consult us.
All TestPro cable assemblies are delivered in individual packaging with attached test report.

THERMAL VACUUM

All configurations excepted NMD2.9 are available with vented connectors for TVAC applications.

VSWR

Maximum VSWR	0-4 GHz		4-12.4 GHz		12.4-18 GHz		18-26.5 GHz		26.5-32 GHz		32-40 GHz	
	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB
2 x SMA3.5	1.15	23.1	1.20	20.8	1.25	19.1	1.30	17.7	-	-	-	-
2 x SMA2.9 (K)	1.15	23.1	1.20	20.8	1.25	19.1	1.27	18.5	1.35	16.5	1.35	15.6

This table gives value for assembly lengths between 200 to 5000 mm (8 to 196 in.)

TEMPERATURE DERATING

Attenuation at X°C = Attenuation (20°C) x (1 + (X - 20) x θ). Ex: θ = 0.002 for copper and silver

CABLE CHARACTERISTICS

CONSTRUCTION / DIMENSIONS

	Material
Center conductor	SPCCS[1]
Dielectric	PTFE[2]
Electrical shield	SPC[3]
Interlayer	aluminum-polyimide
Inner braid	SPC[3]
Inner jacket	PFA[4]
Crush protection	stainless steel
Strength braid	stainless steel
Outer jacket	fibrillated braid
Outer diameter	7.04 mm (0.277 inches)

[1] SPCCS = Silver Plated Copper-Clad Steel
[2] PTFE = Poly-TetraFluoroEthylene
[3] SPC = Silver-Plated Copper
[4] PFA = PerFluoroAlkoxy

ELECTRICAL CHARACTERISTICS

Characteristic impedance	50 ohms ± 1 ohms	
Operating frequency range	DC - 40 GHz	
Cut-off frequency	44 GHz	
Screening effectiveness	> 110 dB at 1 GHz; > 90dB at 18 GHz	
Velocity of propagation	76 %	
Propagation time	4.4 ns / m	1.3 ns / ft
Capacitance	88 pF / m (at 1 GHz)	26.7 pF / ft (at 1 GHz)
Insulation resistance	> 3 x 10^5 MOhm / m	
Corona extinction voltage	-	
Nominal phase	1590 ° / m / GHz	
Phase stability with temperature	< 4° / m / GHz; <2820ppm (-55 / +125°C)	
Phase stability with bending**	5° Typ. / 9.5° Max. (at 40 GHz)	
Attenuation stability with bending**	< 0.1 dB (at 40 GHz)	
Attenuation stability with shaking	< 0.03 dB/m (at 40 GHz)	
Atten. variation with temperature	Att. (at X° C) = att. (at 20° C) x (1 + (X - 20) x 0.002)	

** according to IEC966-1, bending method n°2

APPLICATION NOTE

TestPro 3 is a 40 GHz measurement cable. It combines electrical advantages and Integrated protection system. These ruggedized assemblies offer excellent durability while remaining exceptionally flexible, a unique connector attachment system and strong cable.

MECHANICAL CHARACTERISTICS

Maximum weight	150 g / m	46.3 g / ft
Recommend. min. bend radius	25 mm	0.984 inch
Crush resistance	> 4,400 N / 100 mm (260 lb per linear inch)	
Flex life cycle	20,000 (IEC 966-1 section 9.3)	
Tensile strength	200 N	

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range*	-55 / +200 ° C	-67 / +392 ° F
Fire resistance	yes (MIL C 87104)	
Abrasion resistance	yes (SAE AS5756, edge 0.5 mm, load 2 pounds)	
Halogen-free jacket	no	
ROHS / REACH	yes	

* cable alone. Cable assembly operating temperature range is -55 / + 125 °C (-67 / +257°F)

FREQUENCY / ATTENUATION (typ.) / CW MAX POWER (*)

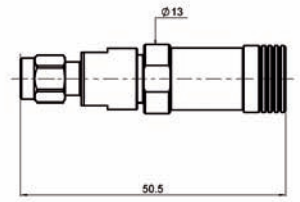
GHz	dB / m	dB / ft	Watts
1.0	0.39	0.12	400
2.0	0.56	0.17	280
4.0	0.81	0.25	200
6.0	1.01	0.31	160
8.0	1.19	0.36	140
12.4	1.53	0.46	120
18.0	1.91	0.58	90
26.5	2.41	0.73	80
40.0	3.11	0.94	60
Attenuation calculation (dB/m)	Typ: (0.365 x $\sqrt{F}$ GHz) + (0.02 x F GHz)		

(*) = CW max power calculated at sea level / 40°C and VSWR 1:1
(Power ratings may be limited by the connector type. Please contact us for specific needs).
Note : typical attenuation for a couple of connectors (dB) = 0.0447 x $\sqrt{F}$ (GHz) + 0.04

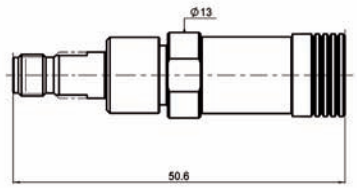
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

SMA 3.5 SERIES



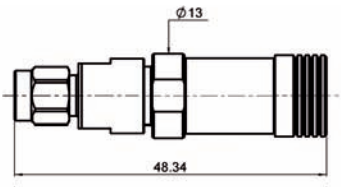
Designation	Straight Plug
Item	R127900001
Max. Freq	26.5 GHz



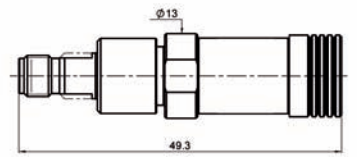
Designation	Straight Jack
Item	R127920001
Max. Freq	26.5 GHz

SMA 3.5 Series characteristics:
Voltage withstanding 750 Vrms
Connector material is stainless steel.
Finish is passivated
Nominal coupling nut torque is 110 N
Recommended torque wrench for plugs:
R282320000 / 8 mm / 80-120 Ncm

SMA2.9 (K) SERIES

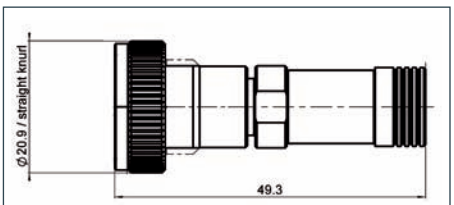


Designation	Straight Jack
Item	R127801321
Max. Freq	40 GHz



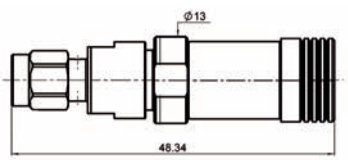
Designation	Straight Jack
Item	R127822111
Max. Freq	40 GHz

SMK Series characteristics:
Voltage withstanding 750 Vrms.
Connector material is stainless steel.
Finish is passivated.
Nominal coupling nut torque is 110 N.
Recommended torque wrench for plugs:
R282320000 / 8 mm / 80-120 Ncm

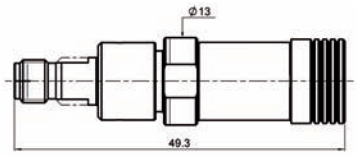


Designation	NMD 2.9 port femal
Item	R299776101
Max. Freq	40 GHz

VENTED CONNECTORS SMA2.9 (K) SERIES



Designation	Vented Straight Plug
Item	R127801311
Max. Freq	40 GHz



Designation	Vented Straight Plug
Item	R127822101
Max. Freq	40 GHz

2.4MM CONNECTORS

Please consult us.

CABLE CHARACTERISTICS

CONSTRUCTION / DIMENSIONS

	Material
Center conductor	SPCCS[1]
Dielectric	PTFE[2]
Electrical shield	SPC[3]
Interlayer	aluminum-polyimide
Strength braid	SPC[3]
Outer jacket	PFA[4]
Outer diameter	3,95 mm (0,156 inches)

[1] SPCCS = Silver Plated Copper-Clad Steel
[2] PTFE = Poly-TetraFluoroEthylene
[3] SPC = Silver-Plated Copper
[4] PFA = PerFluoroAlkoxy

ELECTRICAL CHARACTERISTICS

Characteristic impedance	50 ohms ± 1 ohms	
Operating frequency range	DC - 40 GHz	
Cut-off frequency	44 GHz	
Screening effectiveness	> 110 dB at 1 GHz; > 90dB at 18 GHz	
Velocity of propagation	76 %	
Propagation time	4.4 ns / m	1.3 ns / ft
Capacitance	88 pF / m (at 1 GHz)	26.7 pF / ft (at 1 GHz)
Insulation resistance	> 3 x 10^5 MOhm / m	
Corona extinction voltage	-	
Nominal phase	1590 ° / m / GHz	
Phase stability with temperature	< 4° / m / GHz; <2820ppm (-55 / +125°C)	
Phase stability with bending**	5° Typ. / 9.5° Max. (at 40 GHz)	
Attenuation stability with bending**	< 0.1 dB (at 40 GHz)	
Attenuation stability with shaking	< 0.03 dB/m (at 40 GHz)	
Atten. variation with temperature	Att. (at X° C) = att. (at 20° C) x (1 + (X - 20) x 0.002)	

** according to IEC966-1, bending method n°2

MECHANICAL CHARACTERISTICS

Maximum weight	50 g / m	15.3 g / ft
Recommend. min. bend radius	25 mm	0.984 inch
Crush resistance	> 400 N / 100 mm (23 lb per linear inch)	
Flex life cycle	20,000 (IEC 966-1 section 9.3)	
Tensile strength	200 N	

APPLICATION NOTE

TestPro 3 is a 40GHz measurement cable. It combines electrical advantages and Integrated protection system. These ruggedized assemblies offer excellent durability while remaining exceptionally flexible, a unique connector attachment system and strong cable.

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range*	-55 / +200 ° C	-67 / +392 ° F
Fire resistance	yes (MIL C 87104)	
Halogen-free jacket	no	
ROHS / REACH	yes	

* cable alone. Cable assembly operating temperature range is -55 / + 125 °C (-67 / +257°F)

FREQUENCY / ATTENUATION (typ.) / CW MAX POWER (*)

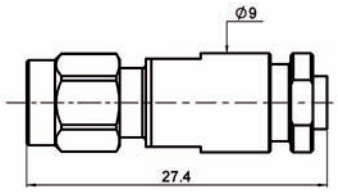
GHz	dB / m	dB / ft	Watts
1.0	0.39	0.12	400
2.0	0.56	0.17	280
4.0	0.81	0.25	200
6.0	1.01	0.31	160
8.0	1.19	0.36	140
12.4	1.53	0.46	120
18.0	1.91	0.58	90
26.5	2.41	0.73	80
40.0	3.11	0.94	60
Attenuation calculation (dB/m)	Typ: (0.365 x √F GHz) + (0.02 x F GHz)		

(*) = CW max power calculated at sea level / 40°C and VSWR 1:1
(Power ratings may be limited by the connector type. Please contact us for specific needs.)
Note : typical attenuation for a couple of connectors (dB) = 0.0447 x √F (GHz) + 0.04

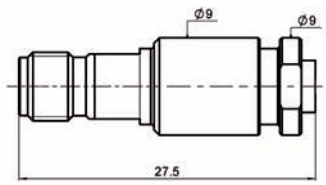
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

SMA 3.5 SERIES



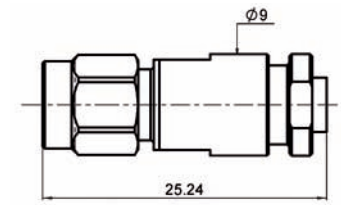
Designation	Straight Plug
Item	R127900011
Max. Freq	26.5 GHz



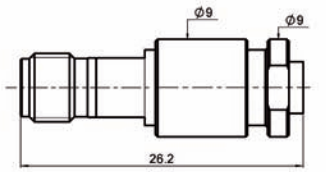
Designation	Straight Jack
Item	R127920011
Max. Freq	26.5 GHz

SMA 3.5 Series characteristics:
Voltage withstanding 750 Vrms
Connector material is stainless steel.
Finish is passivated
Nominal coupling nut torque is 110 N
Recommended torque wrench for plugs:
R282320000 / 8 mm / 80-120 Ncm

SMA2.9 (K) SERIES



Designation	Straight Plug
Item	R127801331
Max. Freq	40 GHz



Designation	Straight Jack
Item	R127822121
Max. Freq	40 GHz

SMA2.9 (K) Series characteristics:
Voltage withstanding 750 Vrms
Connector material is stainless steel.
Finish is passivated
Nominal coupling nut torque is 110 N
Recommended torque wrench for plugs:
R282320000 / 8 mm / 80-120 Ncm

2.4MM CONNECTORS

Please consult us.

MAIN CHARACTERISTICS

ULTRA LOW LOSS BENCH TEST CABLE ASSEMBLY

Properties	TestPro 5	TestPro 8
Frequency range	DC - 26.5 GHz	DC - 18 GHz
Impedance	50 Ω ± 1 Ω	50 Ω ± 1 Ω
IL (dB/m)	1.02 @ 18 GHz	0.68 @ 18 GHz
IL (dB/ft)	0.31 @ 18 GHz	0.21 @ 18 GHz
Phase with flexure stability	7.2° @ 18 GHz	7.2° @ 18 GHz
Amplitude stability (dB)	< 0.05 @ 18 GHz	< 0.05 @ 18 GHz
Shielding Effectiveness	-110 dB min @ 1 GHz	-110 dB min @ 1 GHz
Crush resistance	40 lb/linear in.	60 lb/linear in.
Minimum bend radius	25 mm (1 in.)	40 mm (1.6 in.)
Temperature (°C)	-55 / + 125 °C	-55 / + 125 °C
Connectors	SMA, N, TNC	SMA, N, TNC
Flexure life cycle	5,000	5,000
Mating cycles durability	5,000	5,000
Armor	Available	Available
ROHS / REACH	Yes	Yes

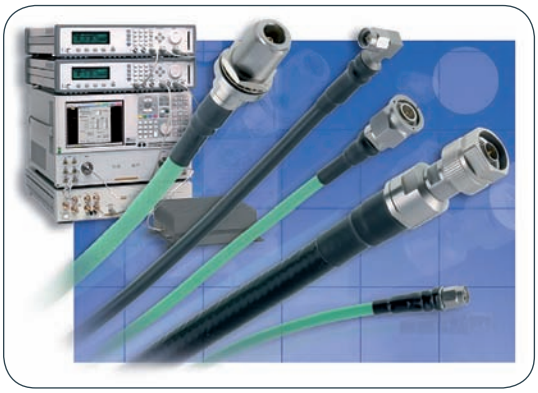
Application note

TestPro 5 and TestPro 8 benefit from Radiall's 30 years of expertise in manufacturing ulra low loss microwave cables. Radiall's mastery of low density PTFE tape wrapping elevates TestPro 5 and TestPro 8 to the position of best performance in the market.

To meet test and measurement requirements, these cables are reinforced. They are terminated with ruggedized TestPro connectors. The combination of the unique center contact captivation system and attachment methods offers very reliable products over multiple matings.

TestPro ultra low loss test and measurement cables are required when loss becomes an issue. Their high stability with temperature makes them easy to use in temperature chambers. They are also suitable for high power applications.

Key features & benefits



- Ultra low loss
- High phase stability with temperature
- Strain relief
- Crush resistance
- Very precise phase matching
- Long length available

Standard available assembly length: 39 inches
Custom lengths available with short lead time.
Typical applications include: test labs, production floor testing, anechoic chambers.

All TestPro cable assemblies are delivered in individual packaging with attached test report.

ULTRA LOW LOSS TEST CABLE ASSEMBLIES

Part number	Operating frequency	Connectors		Length	Attenuation-Nom @2GHz - @18GHz	VSWR-Nom @18GHz
TestPro 5						
R288931001	DC - 26.5 GHz	SMA male	SMA female	39.4 in. / 100 cm	0.42 dB - 1.25 dB	1.20
R288931002	DC - 18 GHz	N male	N male	39.4 in. / 100 cm	0.42 dB - 1.25 dB	1.25
R288931003	DC - 18 GHz	N male	SMA male	39.4 in. / 100 cm	0.42 dB - 1.25 dB	1.25
TestPro 8						
R288931004	DC - 18 GHz	SMA male	SMA female	39.4 in. / 100 cm	0.31 dB - 0.91 dB	1.25
R288931005	DC - 18 GHz	N male	N male	39.4 in. / 100 cm	0.31 dB - 0.91 dB	1.25
R288931006	DC - 18 GHz	N male	SMA male	39.4 in. / 100 cm	0.31 dB - 0.91 dB	1.25

TNC male connector also available. All TestPro cable assemblies are delivered in individual packaging with attached test report.

VSWR

Maximum VSWR	0-4 GHz		4-8 GHz		8-12.4 GHz		12.4-18 GHz	
TestPro 5	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB
2 x SMA (*)	1.15	23	1.20	21	1.20	21	1.25	19
2 x TNC	1.20	21	1.20	21	1.20	21	1.35	17
2 x N	1.20	21	1.25	19	1.25	19	1.30	18
TestPro 8	VSWR	dB	VSWR	dB	VSWR	dB	VSWR	dB
2 x SMA	1.15	23	1.20	21	1.20	21	1.25	19
2 x TNC	1.20	21	1.20	21	1.20	21	1.35	17
2 x N	1.20	21	1.25	19	1.25	19	1.30	18

This table gives values for assembly lengths between 200 to 5000 mm (8 to 196 in.) with straight connectors.
(*) @26.5 GHz VSWR = 1.27 - 18 dB

POWER HANDLING

TestPro 5 & 8 are particularly well suited for Ultra Low Loss and high power applications.
Max power handling is related to connector configurations and customer applications.
Please specify the working frequency, temperature and altitude/pressure.
For more detailed information please consult with Radiall directly.

TEMPERATURE DERATING

Attenuation at X°C = Attenuation (20°C) x (1 + (X - 20) x θ). Ex: θ = 0.002 for copper and silver

CHARACTERICTICS

CONSTRUCTION / DIMENSIONS

	Material
Center conductor	solid SPC(1)
Dielectric	low density PTFE(2)
Inner shield	SPC tape
Outer shield	SPC braid
Jacket	green FEP(3)
Outer diameter	5.85 mm (0.230 inches)

(1) SPC = Silver-Plated Copper
(2) PTFE = Poly-TetraFluoroEthylene
(3) FEP = Fluorinated Ethylene Propylene

ELECTRICAL CHARACTERISTICS

Characteristic impedance	50 ohms ± 1 ohms	
Operating frequency range	DC - 26.5 GHz	
Cut-off frequency	31 GHz	
Screening effectiveness	> 90 dB (at 18 GHz)	
Velocity of propagation	85 %	
Propagation time	3.9 ns / m	1.2 ns / ft
Capacitance	79 pF / m (at 1 GHz)	23.9 pF / ft (at 1 GHz)
Insulation resistance	> 3 x 10^5 MOhm / m	
Corona extinction voltage	> 2.3 kV	
Nominal phase	1400 ° / m / GHz	
Phase stability with temperature	< 1° / m / GHz (-55 / +100°C)	
Phase stability with bending	< 0.4° / 360° / GHz	
Attenuation stability with bending	< 0.05 dB (at 18 GHz) / < 0.1 dB (at 26.5 GHz)	
Attenuation stability with shaking	< 0.01 dB/m (at 18 GHz) / < 0.015 dB/m (at 26.5 GHz)	
Atten. variation with temperature	Att. (at X° C) = att. (at 20° C) x 1 + (X - 20) x 0.002	

MECHANICAL CHARACTERISTICS

Maximum weight	73g / m	22.1g / ft
Recommend. min. bend radius	25 mm	0.984 inch
Crush resistance	> 700N / 100 mm	

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range*	-70 / +200° C	-94 / +392° C
Fire resistance	yes (MIL C 87104)	
Halogen-free jacket	no	

* cable alone. Cable assembly operating temperature range is -55 / +125°C (-67 / + 257°F)

APPLICATION NOTE

This ultra- low loss cable is fully adapted to laboratory applications. It can be reinforced with the "ProJack" protective jacket for high mechanical stress applications.

Main benefits:

- ultra- low loss
- high electrical stability with bending and temperature
- high phase stability with temperature
- strain relief
- high mechanical strength and crush resistance
- broad range of connectors available

FREQUENCY / ATTENUATION (typ.) / CW MAX POWER (*)

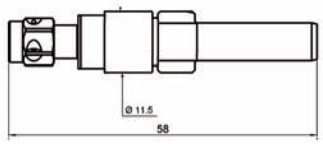
GHz	dB / m	dB / ft	Watts
1.0	0.23	0.07	850
2.0	0.32	0.10	600
4.0	0.46	0.14	420
6.0	0.57	0.17	340
8.0	0.66	0.20	300
10.0	0.75	0.23	270
12.4	0.84	0.25	240
18.0	1.02	0.31	200
26.5	1.27	0.38	190
Attenuation calculation (dB/m)	(0.22 x √F GHz) + (0.005 x F GHz)		

* = CW max power calculated at sea level / 40°C and VSWR 1:1 (Cable-assembly power ratings may be limited by the connector type. Please contact us for specific needs).
Note: typical attenuation for two connectors (dB) = 0.045 x √F GHz + 0.04

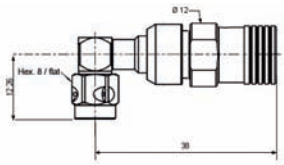
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

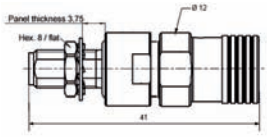
SMA SERIES



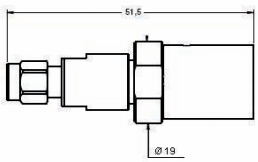
Designation	Straight Plug
Item	M125065C00
Max. Freq	26.5 GHz



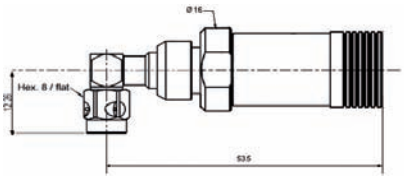
Designation	Right Angle Plug
Item	M125195L02
Max. Freq	18 GHz



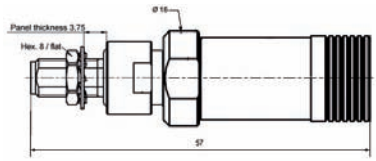
Designation	Straight Jack
Item	M125330L02
Max. Freq	26.5 GHz
Miscellaneous	Panel sealed panel nut torque 200N



Designation	Straight Plug For ProJack
Item	M125065C03
Max. Freq	26.5 GHz



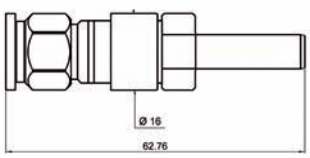
Designation	Right Angle Plug For ProJack
Item	M125195L03
Max. Freq	18 GHz



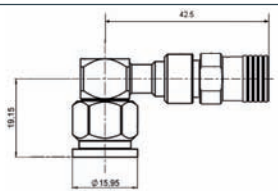
Designation	Straight Jack For ProJack
Item	M125330L03
Max. Freq	26.5 GHz
Miscellaneous	Panel sealed panel nut torque 200N

SMA Series characteristics:
Voltage withstanding 1000 Vrms. Connector material is stainless steel. Finish is passivated.
Nominal coupling nut torque is 110 N (recommended torque wrench for plugs: R28220000 / 8 mm / 80-120 Ncm)

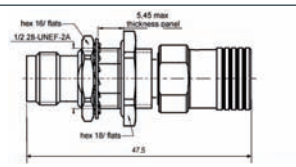
TNC SERIES



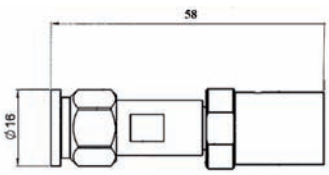
Designation	Straight Plug
Item	M143065C00
Max. Freq	18 GHz



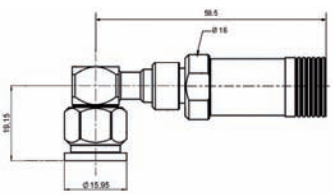
Designation	Right Angle Plug
Item	M143195L02
Max. Freq	18 GHz



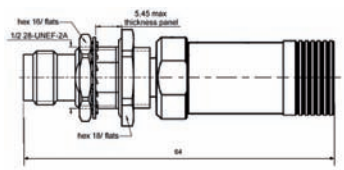
Designation	Straight Jack
Item	M143330L02
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 370N



Designation	Straight Plug For ProJack
Item	M143065C03
Max. Freq	18 GHz



Designation	Right Angle Plug For ProJack
Item	M143195L03
Max. Freq	18 GHz



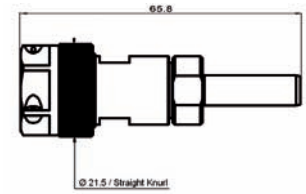
Designation	Straight Jack For ProJack
Item	M143330L03
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 370N

TNC Series characteristics:
Voltage withstanding 1500 Vrms. Connector material is stainless steel. Finish is passivated.
Nominal coupling nut torque is 330 N (recommended torque wrench for plugs: R282300000 / 14 mm / 265 Ncm).

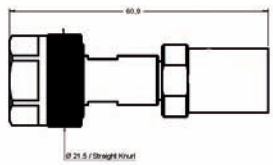
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

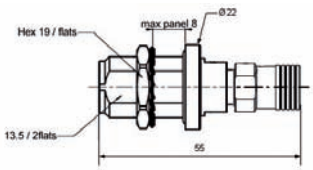
N 18 SERIES



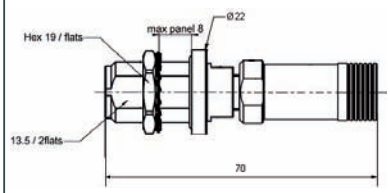
Designation	Straight Plug
Item	M163065C00
Max. Freq	18 GHz



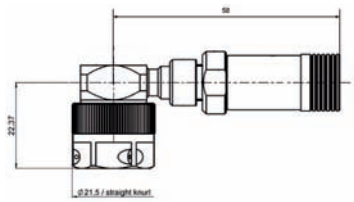
Designation	Straight Plug For ProJack
Item	M163065C03
Max. Freq	18 GHz



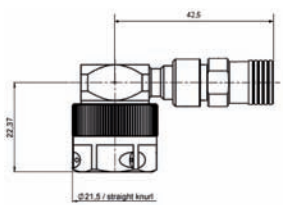
Designation	Straight Jack
Item	M163325L02
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 500N



Designation	Straight Jack For ProJack
Item	M163325L03
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 500N



Designation	Right Angle Plug For ProJack
Item	M163195L03
Max. Freq	18 GHz



Designation	Right Angle Plug
Item	M163195L02
Max. Freq	18 GHz

N 18 Series characteristics:
Voltage withstanding 1500 Vrms
Connector material is stainless steel. Finish is passivated
Nominal coupling nut torque is 400 N (recommended torque wrench for plugs : R282303000 / 19 mm / 160 Ncm)

CHARACTERISTICS

CONSTRUCTION / DIMENSIONS

	Material
Center conductor	solid SPC(1)
Dielectric	low density PTFE(2)
Inner shield	SPC tape
Outer shield	SPC braid
Jacket	green FEP(3)
Outer diameter	8.50 mm (0.335 inches)

(1) SPC = Silver-Plated Copper
(2) PTFE = Poly-TetraFluoroEthylene
(3) FEP = Fluorinated Ethylene Propylene

ELECTRICAL CHARACTERISTICS

Characteristic impedance	50 ohms ± 1 ohms	
Operating frequency range	DC - 18 GHz	
Cut-off frequency	20 GHz	
Screening effectiveness	> 90 dB (at 18 GHz)	
Velocity of propagation	85 %	
Propagation time	3.9 ns / m	1.2 ns / ft
Capacitance	79 pF / m (at 1 GHz)	23.9 pF / ft (at 1 GHz)
Insulation resistance	> 3 x 10^5 MOhm / m	
Corona extinction voltage	> 3.3 kV	
Nominal phase	1400 ° / m / GHz	
Phase stability with temperature	< 1° / m / GHz (-55 / +100°C)	
Phase stability with bending	< 0.4° / 360° / GHz	
Attenuation stability with bending	< 0.05 dB (at 18 GHz)	
Attenuation stability with shaking	< 0.01 dB/m (at 18 GHz)	
Atten. variation with temperature	Att. (at X° C) = att. (at 20° C) x 1 + (X - 20) x 0.002	

MECHANICAL CHARACTERISTICS

Maximum weight	155g / m	47.0g / ft
Recommend. min. bend radius	40 mm	1.575 inch
Crush resistance	> 1000N / 100 mm	

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range*	-70 / +200° C	-94 / +392° C
Fire resistance	yes (MIL C 87104)	
Halogen-free jacket	no	

* cable alone. Cable assembly operating temperature range is -55 / +125°C (-67 / + 257°F)

APPLICATION NOTE

This Ultra- low loss cable is fully adapted to laboratory applications. It can be reinforced with the "ProJack" protective jacket for high mechanical stress applications.

Main benefits:

- ultra- low loss
- high electrical stability with bending and temperature
- high phase stability with temperature
- strain relief
- high mechanical strength and crush resistance
- broad range of connectors available

FREQUENCY / ATTENUATION (typ.) / CW MAX POWER (*)

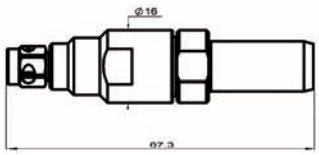
GHz	dB / m	dB / ft	Watts
1.0	0.15	0.04	1600
2.0	0.21	0.06	1100
3.0	0.26	0.08	920
4.0	0.30	0.09	800
5.0	0.34	0.10	710
6.0	0.37	0.11	650
8.0	0.44	0.13	560
10.0	0.49	0.15	500
12.4	0.55	0.17	450
18.0	0.68	0.21	380
Attenuation calculation (dB/m)	(0.14 x √F GHz) + (0.005 x F GHz)		

* = CW max power calculated at sea level / 40°C and VSWR 1:1 (Cable-assembly power ratings may be limited by the connector type. Please contact us for specific needs.)
Note: typical attenuation for two connectors (dB) = 0.0447 x √F GHz + 0.04

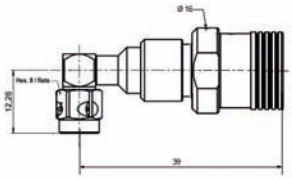
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

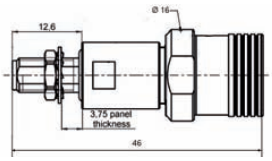
SMA SERIES



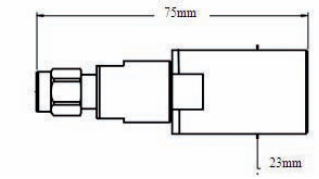
Designation	Straight Plug
Item	M125068C00
Max. Freq	18 GHz



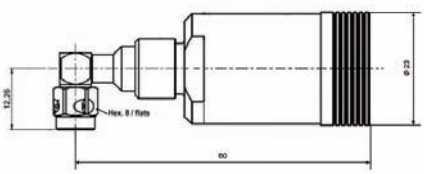
Designation	Right Angle Plug
Item	M125199L04
Max. Freq	18 GHz



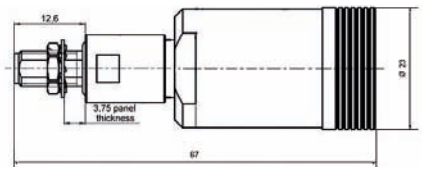
Designation	Straight Jack
Item	M125338L04
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 250N



Designation	Straight Plug For ProJack
Item	M125068C05
Max. Freq	18 GHz



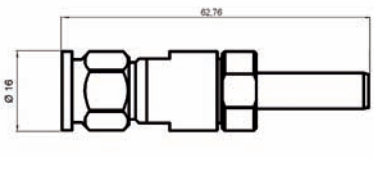
Designation	Right Angle Plug For ProJack
Item	M125199L05
Max. Freq	18 GHz



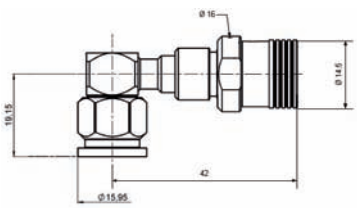
Designation	Straight Jack For ProJack
Item	M125338L05
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 250N

SMA Series characteristics:
Voltage withstanding 1000 Vrms. Connector material is stainless steel.
Finish is passivated.
Nominal coupling nut torque is 110 N (recommended torque wrench for plugs : R282320000 / 8 mm / 80-120 Ncm)

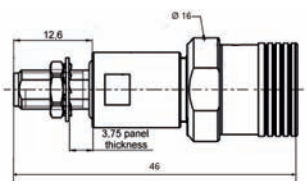
TNC SERIES



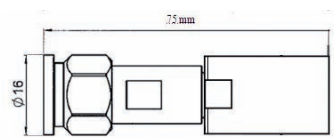
Designation	Straight Plug
Item	M143068C00
Max. Freq	18 GHz



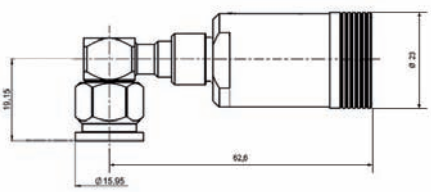
Designation	Right Angle Plug
Item	M143198L04
Max. Freq	18 GHz



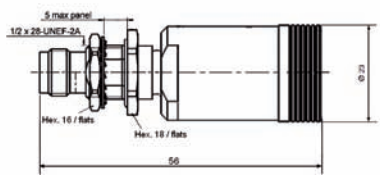
Designation	Straight Jack
Item	M143338L04
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 370N



Designation	Straight Plug For ProJack
Item	M143068C05
Max. Freq	18 GHz



Designation	Right Angle Plug For ProJack
Item	M143198L05
Max. Freq	18 GHz



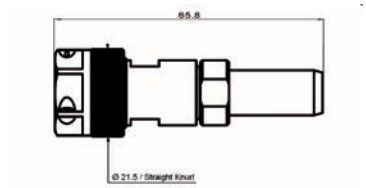
Designation	Straight Jack For ProJack
Item	M143338L05
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 370N

TNC Series characteristics:
Voltage withstanding 1500 Vrms.
Connector material is stainless steel. Finish is passivated.
Nominal coupling nut torque is 330 N (recommended torque wrench for plugs: R282300000 / 14 mm / 265 Ncm)

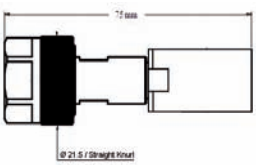
CONNECTORS COMPATIBLE WITH

Connector part numbers are for indication only. Connectors and cables cannot be ordered separately.

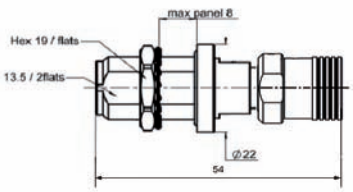
N 18 SERIES



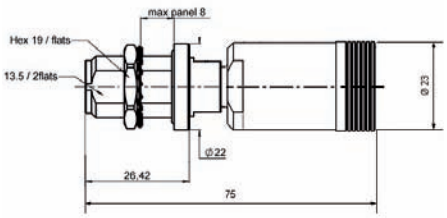
Designation	Straight Plug
Item	M163068C00
Max. Freq	18 GHz



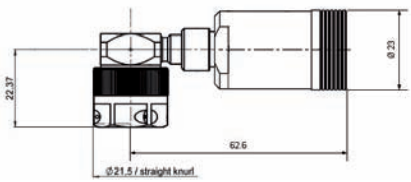
Designation	Straight Plug For ProJack
Item	M163068C05
Max. Freq	18 GHz



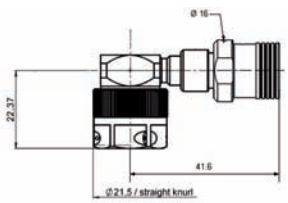
Designation	Straight Jack
Item	M163328L04
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 500N



Designation	Straight Jack For ProJack
Item	M163328L05
Max. Freq	18 GHz
Miscellaneous	Panel sealed panel nut torque 500N



Designation	Right Angle Plug For ProJack
Item	M163198L05
Max. Freq	18 GHz



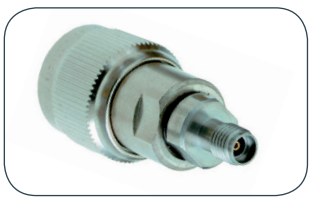
Designation	Right Angle Plug
Item	M163198L04
Max. Freq	18 GHz

N 18 Series characteristics:
Voltage withstanding 1500 Vrms
Connector material is stainless steel.
Finish is passivated.
Nominal coupling nut torque is 400 N
(recommended torque wrench for plugs:
R282303000 / 19 mm / 160 Ncm)

IN-SERIES ADAPTORS (DC-18 GHZ)

Interface	Male - Male	Male - Female	Female - Female	Miscellaneous
SMA	R125703000 R125703001	R125704000 R125704001	R125705000 R125705001	Gold-plated stainless steel Passivated stainless steel
TNC 18	R143703700	R143705700	R143704700 R143710700 R143730700	Square flange Bulkhead
N 18	R163703001	R163708001	R163705001	Silicon gasket

BETWEEN SERIES ADAPTORS (DC-18 GHZ)



Interface		PC7	N 18		
			Male	Female	Female bulkhead panel sealed
SMA	Male Female	R191009000 R191011000			
PC 3.5	Male Female	R191010000 R191012000	R191324000 R191328000	R191326000 R191330000	R191333000

ATTENUATORS

Interface m/f	Average power (W)	Frequency (GHz)							
		3	4	6	8	12.4	18	26.5	40
N	1			R4127xx124					
	2					R4147xx000	R4147xx161		
	15				R4157xx000		R4160xx000		
QMA	1			R4117xx124					
SMA	1			R4118xx124 (*)					
	2		R4138xx115 (**)				R4118xx121 (*)	R4138xx121 (*)	
	15				R4153xx000		R4161xx000		
SMA2.9	2								R4133xx000
TNC	1	R4125xx124							
	2					R4145xx000	R4145xx161		
	15				R4155xx000		R4168xx000		

xx for attenuation. Typicale values are 03, 06, 10, 20, 30. For other attenuation value please consult us.
High power attenuators available (up to 100W)
BNC and 7/16 interface available
* .75 in. attenuators
** .86 in. attenuators

TERMINATIONS

Interface		Average power (W)	Frequency (GHz)				
			4	12.4	18	26.5	40
N	male female	1	R404131000 R404132000	R404240000 R404245000			
	male female	2			R404340000 R404355000		
QMA	male	1	R404114000				
QN	male	1	R404116000				
SMA	male female	1	R404101000 R404102000				
	male female	2			R404210000	R404213000 R404219000	
SMA2.9	male female	1					R404280000 R404285000
TNC	male female	1	R404121000 R404122000	R404225000			
	male female	2			R404370000 R404375000		

Medium and high power terminations also available (6 to 1000 W)

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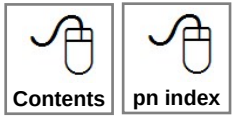

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