

PS50 SERIES

High Performance Low Loss Phase Stable RF Cable

DC to 50 GHz



Product Description

The PS50 Series is a premium phase-stable cable designed for demanding test and measurement, aerospace and defence applications. Featuring superior amplitude and phase stability over temperature, flexure and vibration, RadianWorks PS50 delivers repeatable, reliable performance in environments where signal integrity is critical.

Constructed with an ultra-low-density PTFE dielectric and silver-plated copper conductors, the PS50 maintains excellent electrical performance from DC to 50 GHz with low insertion loss and high shielding effectiveness.

Key Features

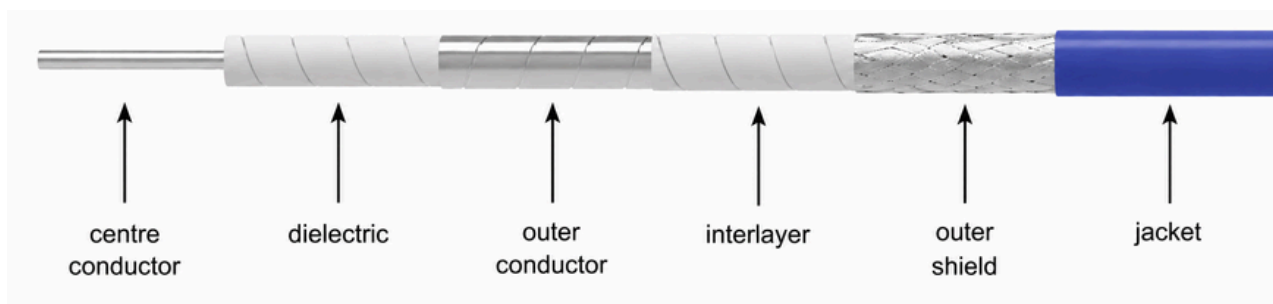
- Phase stable over flexure
 - DC to 50 GHz frequency range
 - Low insertion loss
- High shielding effectiveness (>90 dB)
 - Excellent VSWR performance
 - Strong amplitude stability under vibration

Typical Applications

- Test bench applications
 - Short range point to point
 - V band Communications
- High frequency radar systems
 - Automated test equipment
 - High-capacity 5G systems

Frequency	Impedance	VSWR (Connector dependent)	Attenuation
DC - 50 GHz	50 Ω	1.25 - 1.4 Max	3.29 dB/m @ 50 GHz

Construction & Specifications



Construction Materials

Component	Material	Size (mm)
Centre Conductor	Solid silver-plated copper	0.72
Dielectric	Low density PTFE	2.15
Outer Conductor	Silver-plated copper foil	2.30
Interlayer	PTFE tape	2.60
Outer Shield	Silver-plated copper braid	3.05
Jacket	Blue FEP	3.60

Electrical Specifications

Parameter	Value	Conditions
Frequency Range	DC to 50 GHz	
Impedance	50 Ω	
Attenuation	3.29 dB/m	@ 50 GHz, 25 °C
VSWR	1.35max	With 2.4mm - See available connectors
Shielding Effectiveness	>90 dB	@ 50 GHz
Phase Stability (Flexure)	$\pm 5^\circ$	360° at 36 mm radius
Amplitude stability with vibration	+/-0.1dB	
Capacitance	88 pF/m	Calculated
Velocity of Propagation	76%	
Power Handling	0.41 kW	@ 1 GHz, sea level, 40 °C

Mechanical Specifications

Parameter	Value
Cable Outer Diameter	3.60 mm (0.142 in)
Minimum Bend Radius (static)	18 mm (0.709 in)
Minimum Bend Radius (repeated)	36 mm (1.417 in)
Cable Weight	34 g/m (0.023 lbs/ft)
Operating Temperature	-55 °C to +150 °C
Storage Temperature	-65 °C to +160 °C

Performance Highlight

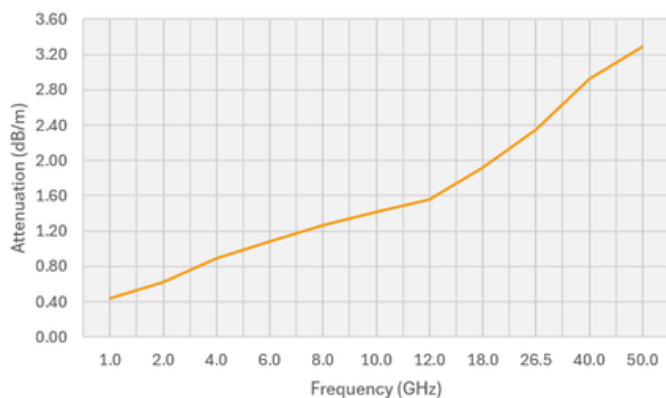
PS50 delivers industry-leading phase stability of $\pm 5^\circ$ over a 360° bend, making it ideal for applications where measurement repeatability is paramount and phase matching is required.

Performance Data

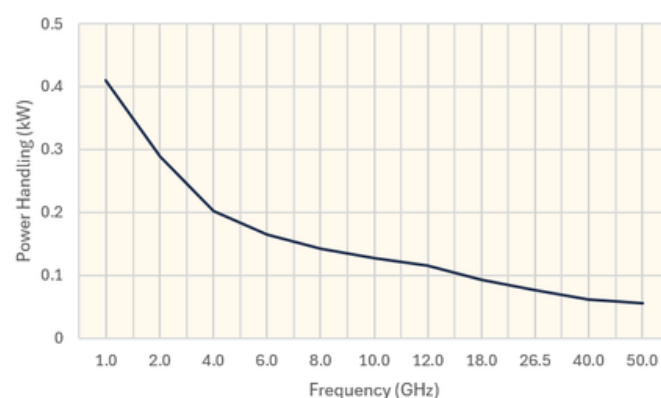
Attenuation vs Frequency

Freq (GHz)	1	2	4	6	8	10	12	18	26.5	40	50
dB/m	0.44	0.62	0.89	1.09	1.26	1.42	1.55	1.92	2.35	2.92	3.29

Attenuation vs Frequency



Power Handling vs Frequency



Performance Equations

$$\text{Attenuation (dB/m)} = K1 * \sqrt{f} + K2 * f$$

Where: K1 = 1.370735 (conductor loss), K2 = 0.000440 (dielectric loss), f = frequency in MHz

$$\text{Power Handling (W) @ 40 °C} = P_{\text{max}} / (\text{Attenuation Factor} * \sqrt{f})$$

Phase Stability

Phase change vs flexure: $\pm 5^\circ$ max over 360° bend at 50 GHz.

Phase-matched sets available upon request.

Available Connectors

Connector	Orientation	Gender	Max Freq (GHz)	VSWR Max
SMA	Straight	Male / Female	26.5	1.25
SMA	90 degree	Male only	18	1.35
N Type	Straight	Male only	18	1.3
3.5 mm	Straight	Male / Female	33	1.3
2.92 mm	Straight	Male / Female	40	1.3
2.92 mm	90 degree	Male only	40	1.4
2.92 mm	Straight Bulkhead	Female only	40	1.35
2.4 mm	Straight	Male / Female	50	1.35

Notes & Test Conditions

1. All measurements performed at 25 °C unless otherwise stated.
2. Attenuation values are typical and measured on 1m assembly with 2.4mm connectors.
3. Mechanical phase stability measured wrapped 360° on 36 mm radius mandrel
4. Power handling is CW (continuous wave) at sea level with no derating.
5. Custom connector configurations available on request.

Ordering Information

Ordering Guide

Use the part number structure below to specify your cable assembly configuration.

Part Number Builder

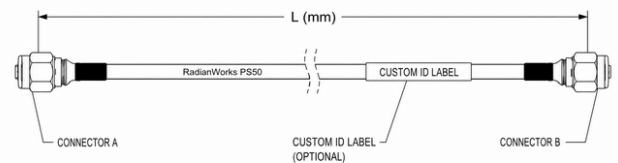
PS50 - CON A - CON B - LLLL

Example: PS50-2.4M-2.4M-500 = 500mm 50 GHz assembly with straight 2.4mm male connectors at each end

Code	Position	Description
PS50	Product	PS50 Series flexible Cable
SM / SF / S90	Connector	SMA Male / SMA Female / SMA Male 90
NM	Connector	N Male
3.5M / 3.5F	Connector	3.5mm Male / 3.5mm Female
2.92M / 2.92F	Connector	2.92mm Male / 2.92mm Female
2.92RA / 2.92B	Connector	2.92mm Male 90 / 2.92mm Female Bulkhead
2.4M / 2.4F	Connector	2.4mm Male / 2.4mm Female
0500	Length	Length in mm (e.g. 500 = 500mm)

Custom Requirements

Assemblies can be manufactured directly from customer drawings or developed from a performance specification, with our engineering team creating detailed assembly documentation where required. Options include custom lengths, connector configurations, ruggedised constructions, and customer-specific identification labels. For phase-critical applications, precision phase-matched cable sets can also be supplied to defined electrical matching tolerances.



Standard Lengths

300mm | 500mm | 610mm | 900mm | 1000mm | 1200mm | 1500mm | 1800mm | 2000mm

Custom lengths available. Contact sales for non-standard requirements.

Cable Options

- Armoured jacket (-A suffix)
- End unterminated (-UT suffix)
- Matched phase pairs (-MP suffix)
- Custom labelling and marking
- Ruggedised strain relief boots

Custom Solutions

RadianWorks specialises in custom cable assembly solutions for demanding applications. Our engineering team can design bespoke assemblies to meet your exact specifications including non-standard lengths, connector combinations, and environmental requirements.

Request a Quote

sales@radianworks.com | www.radianworks.com/quote

Precision. Reliability. Performance.