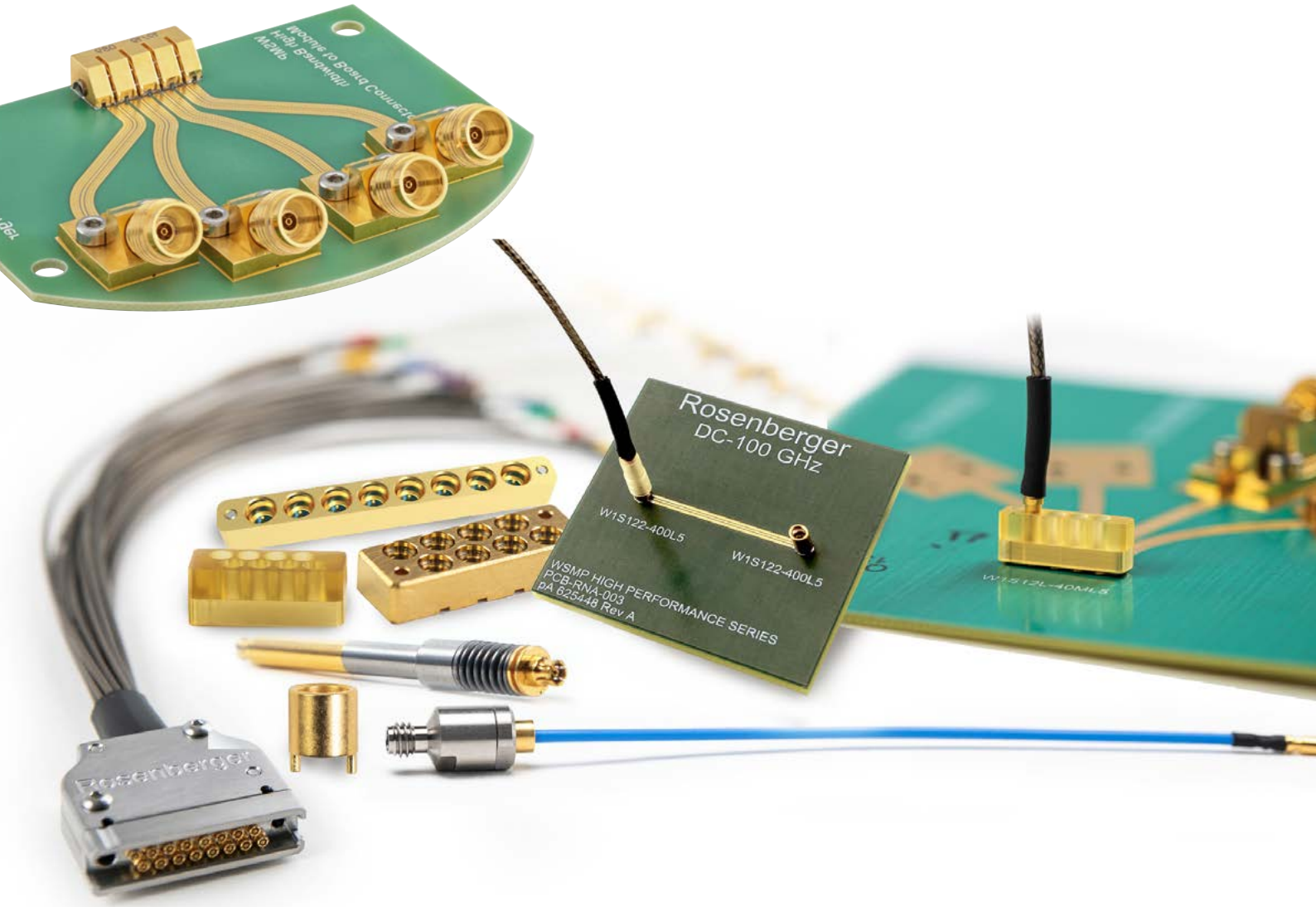
Rosenberger

For High Density Applications up to 100 GHz

WSMP® Coaxial Connectors and Cable Assemblies

AEROSPACE, SECURITY & DEFENCE



Company Profile

About Rosenberger

Rosenberger, a family owned company, is one of the world's leading manufacturers of impedance-controlled connectivity solutions in high-frequency, high-voltage and fiberoptic technology. Renowned companies in high-tech industries trust the precision and quality of Rosenberger products, e.g. mobile communication networks, data centers, test & measurement industries, automotive electronics, industrial and medical electronics, or spaceflight engineering.

Worldwide, the Rosenberger group operates a global network of R&D, manufacturing and assembly locations as well as Rosenberger sales offices in Europe, Asia and North and South America where more than 11,800 employees develop, produce and sell our products.

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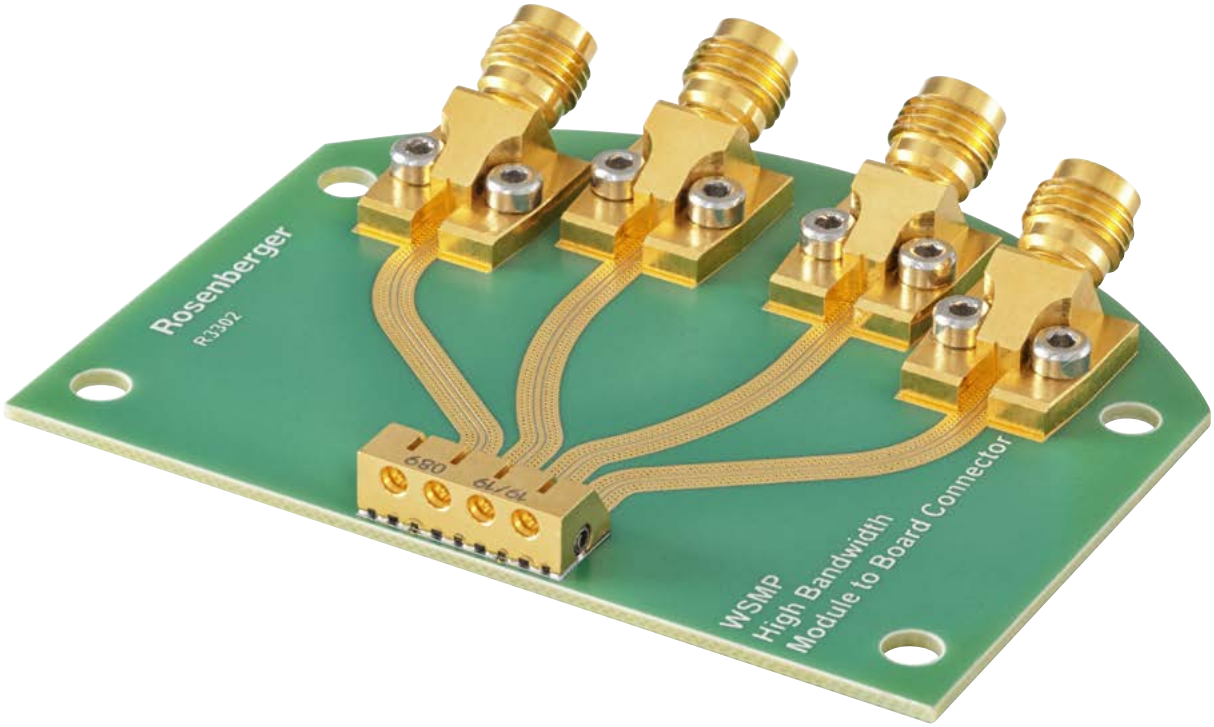


WSMP® Coaxial Connectors and Cable Assemblies

The portfolio of WSMP® RF coaxial connectors covers PCB connectors, bullets and cable asemblies — extremely small connectors with minimum board-to-board distances of 3.05 mm.

Features

- Signal integrity to 100 GHz
- Center-to-center spacing 2.15 mm
- Board-to-board height of 5.03 mm, 3.05 mm possible
- 45% smaller than SMP; 35% smaller than Mini-SMP
- Custom footprints for optimized RF performance on your PC board
- Custom RF cable assemblies for your application

The Rosenberger online catalog contains the current product range with specific details, including data sheets, assembly instructions and panel piercings.

www.rosenberger.com/ok/wsmp

Standard WSMP® Connectors

Technical Data

Applicable Standards

Interface according to	Rosenberger WSMP®

Materials and Plating

Connector parts	Material	Plating
Center contact	Kovar® or CuBe	Au plating
Outer contact	Kovar® or CuBe	Au plating
Dielectric	PTFE, polyamide or CORNING 7070™ glass	

Electrical Data

Impedance	50 Ω
Frequency range	DC to 100 GHz
Return loss (typical)	≥ 26 dB, DC to 26.5 GHz ≥ 19 dB, 26.5 to 65 GHz
Insertion loss	≤ 0.12 x $\sqrt{f(GHz)}$ dB
Insulation resistance	≥ 3.5 x 10^3 MΩ
Outer contact resistance	≤ 2.0 mΩ
Center contact resistance	≤ 6.0 mΩ
Test voltage (at sea level)	250 V rms
RF high potential (at sea level)	150 V rms @ 5 MHz
RF-leakage (optional)	≥ -80 dB (typical mated pair) @ 30 GHz

Mechanical Data

Mating Cycles	
Full detent	≥ 100
Smooth bore	≥ 500
Engagement force (typical)	
Full detent	11.0 N, 2.47 Lbs.
Smooth bore	5.3 N, 1.19 Lbs.
Disengagement force (typical)	
Full detent	20.0 N, 4.5 Lbs.
Smooth bore	4.45 N, 1.0 Lbs.
Misalignment	
Axial misalignment	0.00 - 0.13 mm
Radial misalignment	±0.25mm

Environmental Data

Temperature range	-55 ºC to +165 ºC
Thermal shock	MIL-STD-202, Meth. 107, Cond. B
Corrosion	MIL-STD-202, Meth. 101
Vibration	MIL-STD-202, Meth. 204, Cond. D
Shock	MIL-STD-202, Meth. 213, Cond. I
Moisture resistance	MIL-STD-202, Meth. 106, except Step 7B
Max. soldering temperature (optional)	IEC 61760-1, +260 °C for 10 sec.
RoHS	compliant
Hermetically sealed to 1 x 10^{-8} cc/sec	on request

Cable Connectors

Rosenberger No.	Remarks	Description	Product
W1K101A-270D3		Female straight for .047 cable	
W1S101A-270D3	Full detent	Male straight for .047 cable	
W1S141A-270D3	Smooth bore		
W1K203A-270D3		Female right angle for .047 cable	
W1S501A-270D3	Full detent	Male straight bulkhead for .047 cable	
W1S541A-270D3	Smooth bore		

PCB Connectors

Rosenberger No.	Remarks	Description	Product
W1S103A-40ML5	Full detent	Male PCB, straight, SMT, J-Lead	
W1S143A-40ML5	Smooth bore		
W1S204A-40ML5	Full detent	Male PCB edge mount	
W1S244A-40ML5	Smooth bore		
W1S12AA-40ML5	Full detent, 2-port	Male PCB, straight, SMT, J-Lead, multiport arrays	
W1S15AA-40ML5	Smooth bore, 2-port		
W1S12BA-40ML5	Full detent, 4-port	Male PCB, straight, SMT, J-Lead, multiport arrays	
W1S15BA-40ML5	Smooth bore, 4-port		

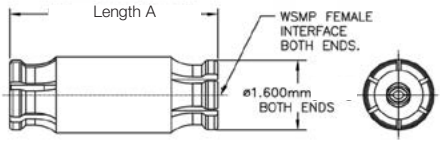
Hermetic Sealed Connectors

Rosenberger No.	Remarks	Description	Product
W1S101A-5H0L5	Full detent	Straight, PCB plug, solder-in hermetic	
W1S141A-40ML5	Smooth bore		

Shroud/Pin

Rosenberger No.	Remarks	Description	Product
W1S104A-40ML5	Full detent	Straight, PCB plug, pin/shroud kit	
W1S144A-40ML5	Smooth bore		

Adaptors – Female Blindmate Interconnect (Bullet)

Rosenberger No.	Length A*	Description	Product
W1K10AA-K00D3	2.49 mm		
W1K10CA-K00D3	3.18 mm		
W1K10FA-K00D3	3.81 mm		
W1K10GA-K00D3	5.08 mm		
W1K10HA-K00D3	6.35 mm		
W1K10JA-K00D3	7.62 mm		
W1K10MA-K00D3	10.16 mm		
W1K10NA-K00D3	12.70 mm		
W1K10PA-K00D3	15.24 mm		

* Additional lengths available on request

Compressible Adaptors

Rosenberger No.	Description	Product
W1KF1W1A-K03D3	Compressible bullet, 12.70 mm	

High-Speed WSMP® Connectors

Applications

- Optical transceivers
- 100G – 400G optical network applications
- Laser modulators
- Typical application: Integrated polarization multiplexed quadrature modulators according to OIF_HBPMQ-TX-010

Multiport Connectors

Rosenberger No.	Remarks	Description	Product
W1S20MA-40ME4	Full detent	Male, full detent, 4-port SMT	

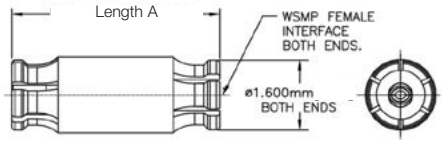
Edge-Mount Connectors

Rosenberger No.	Remarks	Description	Product
W1S20JA-40ML5	Full detent	Male, 4-port, edge-mount	
W1S24JA-40ML5	Smooth bore		
W1S20HA-40ML5	Full detent	Male, 8-port, edge-mount	
W1S24HA-40ML5	Smooth bore		

Hermetic Sealed Connectors

Rosenberger No.	Remarks	Description	Product
W1S10ZA-40ML5	Full detent	Male, 4-port, vertical-mount	
W1S14ZA-40ML5	Smooth bore		
W1S10SA-40ML5	Full detent	Male, 8-port, vertical-mount	
W1S14SA-40ML5	Smooth bore		

Adaptors – Female Blindmate Interconnect (Bullet)

Rosenberger No.	Length A*	Description	Product
W1K10AA-K00D3	2.49 mm		
W1K10CA-K00D3	3.18 mm		
W1K10FA-K00D3	3.81 mm		
W1K10GA-K00D3	5.08 mm		
W1K10HA-K00D3	6.35 mm		
W1K10JA-K00D3	7.62 mm		
W1K10MA-K00D3	10.16 mm		
W1K10NA-K00D3	12.70 mm		
W1K10PA-K00D3	15.24 mm		

* Additional lengths available on request

New Generation WSMP® Connectors

Technical Data

True high frequency performance thru 100 GHz. Footprint optimization available.

Electrical Data

Impedance	50 Ω
Frequency range	Next Gen 100 GHz
Return loss (typical)	≥ 18 dB, DC to 40 GHz ≥ 15 dB, 40 to 70 GHz ≥ 12 dB, 70 to 100 GHz
Insertion loss	≤ 0.12 x $\sqrt{f(GHz)}$ dB
Insulation resistance	≥ 3.5 x 10^3 MΩ
Outer contact resistance	≤ 2.0 mΩ
Center contact resistance	≤ 6.0 mΩ
Test voltage (at sea level)	250 V rms
RF High potential (at sea level)	150 V rms @ 5 MHz
RF-leakage (optional)	≥ -80 dB (typical mated pair) @ 30 GHz

Multiport Connectors

Rosenberger No.	Remarks	Description	Product
W1S122A-400L5	Full detent	Male, single-port, SMT shroud	
W1S152A-400L5	Smooth bore		
W1S12KA-40ML5	Full detent	Male, 1 x 2-port, SMT shroud	
W1S15KA-40ML5	Smooth bore		
W1S12LA-40ML5	Full detent	Male, 1 x 4-port, SMT shroud	
W1S15LA-40ML5	Smooth bore		
W1S12NA-40ML5	Full detent	Male, 2 x 4-port, SMT shroud	
W1S15NA-40ML5	Smooth bore		
W1S12MA-40ML5	Full detent	Male, 1 x 8-port, SMT shroud	
W1S15MA-40ML5	Smooth bore		

New Generation WSMP® Alignment Covers

Strain reliefs are available that securely hold a cable assembly in place during Test & Measurement or other applications. Alignment covers slide over the WSMP connector.

Rosenberger No.	Description	Product
W1S152A-400/50	Single port alignment cover	
W1S15KA-40M/50	1 x 2-port alignment cover	
W1S15LA-40M/50	1 x 4-port alignment cover	
W1S15MA-40M/50	1 x 8-port alignment cover	
W1S15NA-40M/50	2 x 4-port alignment cover	

Cable Assemblies

Rosenberger's high frequency, flexible cable assemblies incorporating high performance RPC-1.85, RPC-2.92 and WSMP® connectors.




Cable Assemblies

Rosenberger No.	Connector 1	Connector 2	Cable	Electrical Specifications (typical)
RPC-1.85 to WSMP®				
L70-460-xxx	RPC-1.85 (m)	WSMP® (f)	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
L70-461-xxx	RPC-1.85 (f)	WSMP® (f)	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
L70-462-xxx	RPC-1.85 (m)	WSMP® (f) r/a	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
RPC-2.92 to WSMP®				
L70-463-xxx	RPC-2.92 (m)	WSMP® (f)	RTK Flex .047	DC-40 GHz, R.L.> 12 dB @26 GHz, typical
L70-464-xxx	RPC-2.92 (f)	WSMP® (f)	RTK Flex .047	DC-40 GHz, R.L.> 12 dB @26 GHz, typical
L70-465-xxx	RPC-2.92 (m)	WSMP® (f), r/a	RTK Flex .047	DC-40 GHz, R.L.> 12 dB @26 GHz, typical
WSMP® to WSMP®				
L70-466-xxx	WSMP® (f)	WSMP® (f)	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
L70-467-xxx	WSMP® (f) r/a	WSMP® (f) r/a	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
L70-468-xxx	WSMP® (f)	WSMP® (f) r/a	RTK Flex .047	DC-70 GHz, R.L.> 12 dB @26 GHz, typical
RPC-1.00 to WSMP®				
L70-323-102	WSMP® (f)	RPC-1.00 (m)	RTK Flex .047	DC-100 GHz, RL ≥ 10 dB @50 GHz, typical
L70-336-102	WSMP® (f)	RPC-1.00 (f)	RTK Flex .047	DC-100 GHz, RL ≥ 10 dB @50 GHz, typical

xxx: Please fill in requested length (standard length = 50/100/500/1000 mm)

PCB Plug, Straight, 2 x 8

Rosenberger No.	Description	Product
W1S14PA-40ML5	Straight PCB plug	

Cable Assemblies

Rosenberger No.	Description	Product
L70-469-xxx L70-470-xxx L70-471-xxx	2 x 8 to RPC-2.92 male, 30.48 cm 2 x 8 to RPC-1.85 male, 30.48 cm 2 x 8 to 2x8, 30.48 cm	

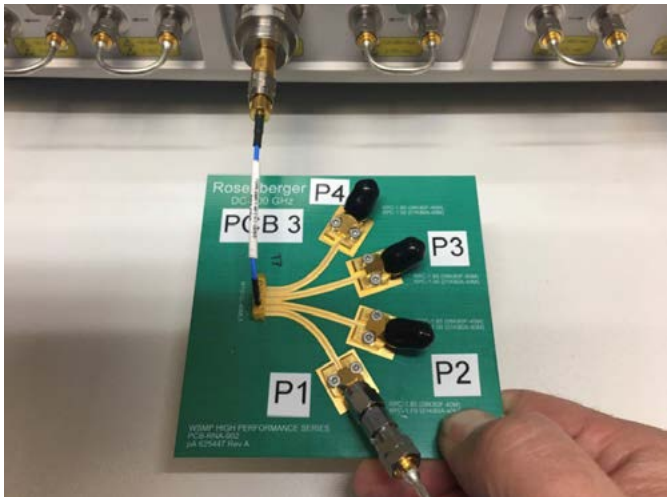
xxx: Please fill in requested length (standard length = 50/100/500/1000 mm)

New Generation High-Performance WSMP® Test Results

Rosenberger's new generation high-performance WSMP® connectors offer true 100 GHz performance in a small, high-density package. The test structure below is used to validate RF measurements to 100 GHz.

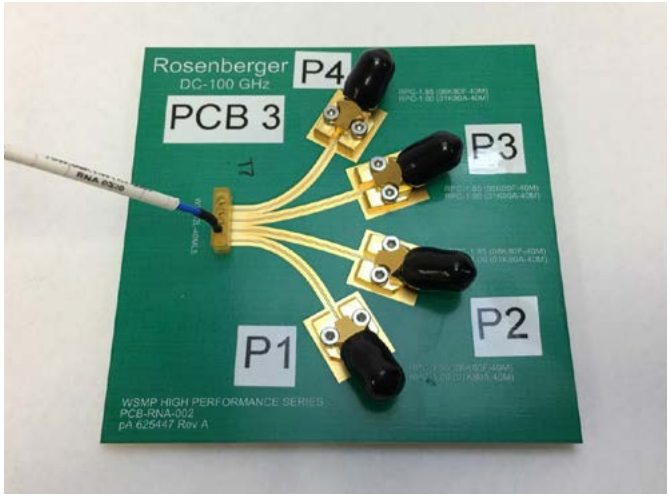
Test Setup

Pictured to the right is a detail of the high-performance WSMP® test setup. This is used to take a "full path" measurement from VNA port 1 that includes a full WSMP® cable assembly, WSMP® mated interfaces, PCB connector and transitions, PCB trace, solderless precision connector, and mated port 2 cable assembly.

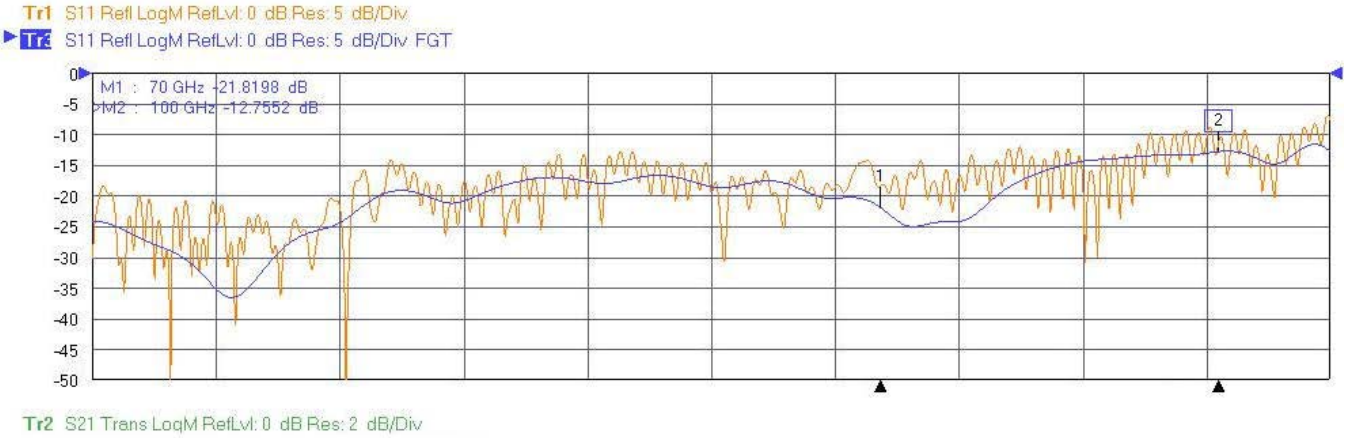


Pictured to the right is the basic test setup for gating the WSMP® connector performance as it transitions to the PCB. Gate 1 is set in Time Domain at a point along the cable assembly while Gate 2 is set along the PCB trace. The "gated path" reveals the true RF measurements of the new generation WSMP® connector system that includes the mated interface, PCB connector, and PCB transition.

**Also shown is the optional alignment cover to provide mechanical stability during measurements.

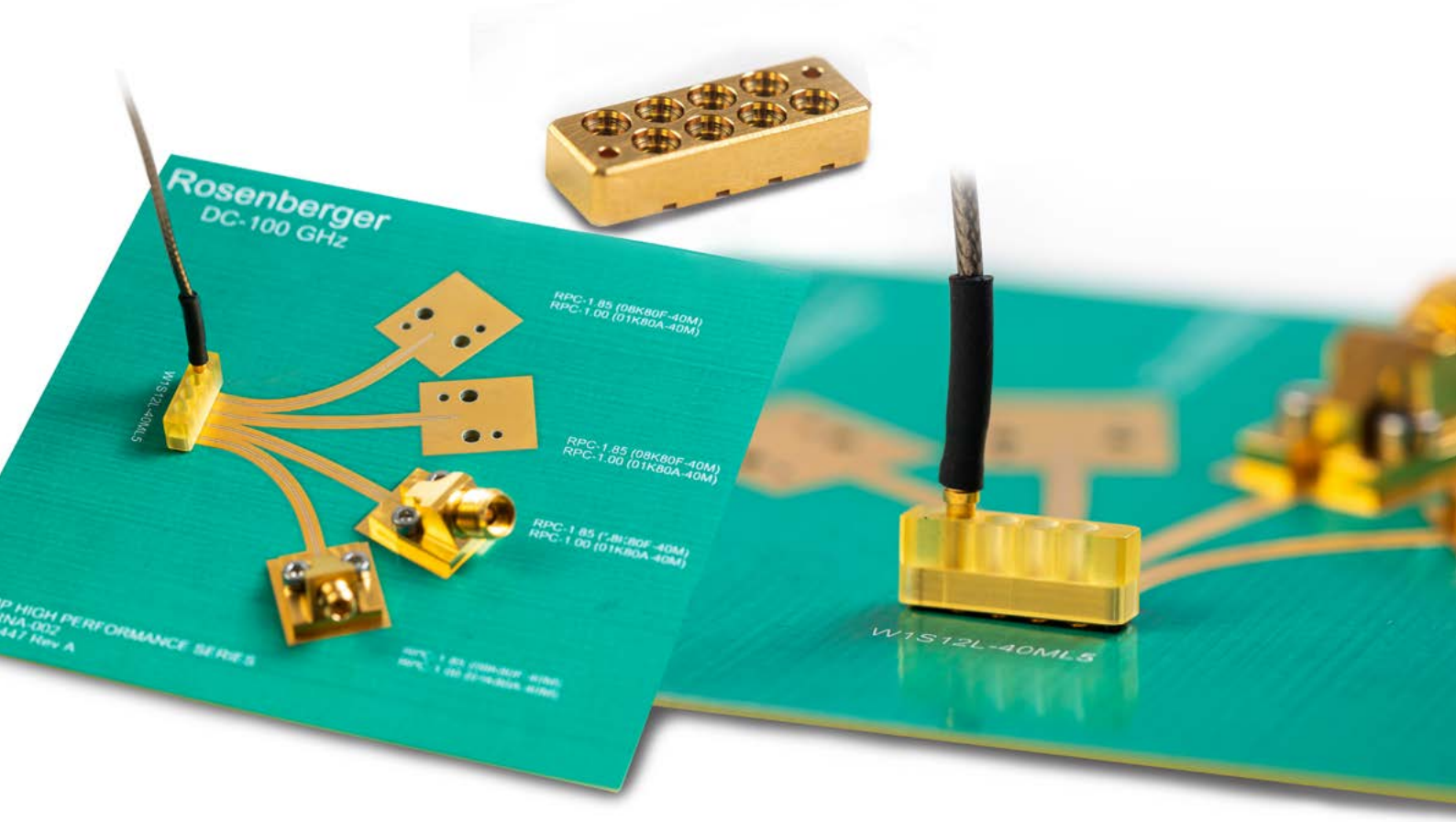


Summary of Test Results



The Vector Network Analyzer‘s (VNA) output plot (port 1 through port 2):

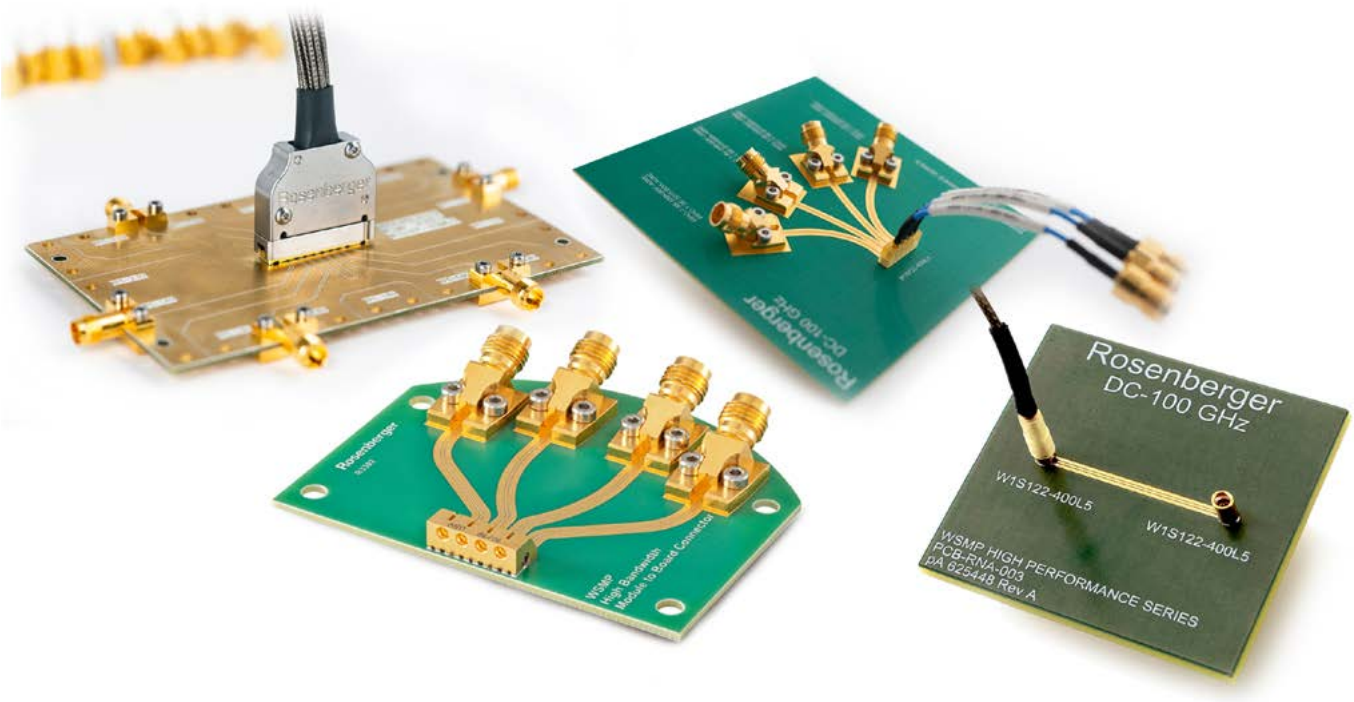
- The beige trace is the "full path" from figure 1 (the cable, PCB connector, trace and termination).
- The blue trace is the result of the "gated path" from figure 2. The gated measurements demonstrate performance of the NexGen WSMP® return loss value exceeding approximately 12 dB out to 100 GHz.



WSMP® and New Generation WSMP® Product Evaluation Boards

Rosenberger offers several product evaluation boards that are available to our customers so that they may evaluate and test the product as they choose. The evaluation boards come in four configurations: single port new generation WSMP®, 1x4-port new generation WSMP®, 2x8-channel WSMP® (standard WSMP®) and finally, high speed OIF style connectors. The following evaluation boards are available on request:

EV Board Style	Frequency	Connectors EV Board
1 x 1	70 GHz	2 WSMP (m) NexGen ((W1S122-400L5), connected with through-line 2 cable assemblies (WSMP (f) to RPC-1.85 (m)
1 x 1	100 GHz	2 WSMP (m) NexGen ((W1S122-400L5), connected with through-line 2 cable assemblies (WSMP (f) to RPC-1.00 (m)
1 x 4	70 GHz	1 x 4-WSMP block NexGen, 4 RPC-1.85 (f), connected with through-line 2 cable assemblies (WSMP (f) to RPC-1.85 (m)
1 x 4	100 GHz	1 x 4-WSMP block NexGen, 2 RPC-1.85 (f), 2 RPC-1.00 (f), connected with through-line 2 cable assemblies
2 x 8	40 GHz	1 x 2x8 (16-channel) WSMP block, 3 RPC-1.85 (f), 3 RPC-2.92 (f), connected with through-line 1 mating cable assembly (RPC-2.92)
2 x 8	70 GHz	1 x 2x8 (16-channel) WSMP block, 3 RPC-1.85 (f), 3 RPC-2.92 (f), connected with through-line 1 mating cable assembly (RPC-1.85)
1 x 4	110 GHz	1 OIF connector (4-channel), solderless RPC-1.00, RPC-1.85, connected with through-line



Accessories

In-Between Series Test Adaptors

Rosenberger No.	Frequency	Description	Product
W1S102-K00S3 W1S108-K00S3 W1S109-S00S3 W1S109-K00S3 W1S101-S00D3	40 GHz 65 GHz 50 GHz 50 GHz 100 GHz	WSMP® (m) full detent to RPC-2.92 (f) adaptor RPC-1.85 (f) adaptor RPC-2.40 (m) adaptor RPC-2.40 (f) adaptor RPC-1.00 (m) adaptor	
W1K102-K00D3 W1K108-K00D3 W1K109-K00D3 W1K101-K00D3	40 GHz 67 GHz 50 GHz 50 GHz	WSMP® (f) to RPC-2.92 (f) adaptor RPC-1.85 (f) adaptor RPC-2.40 (f) adaptor RPC-1.00 (f) adaptor	

Tools

Roenberger No.	Description	Product
W1W002-000	Bullet insertion/extraction tool	
W1W005-000	Right angle prybar extraction tool	
W1W001-000	Cable connectors prybar extraction tool	

Status March 2021 – Technical modifications and errors excepted. Similar images.

Website

For more information refer to our website:
www.rosenberger.com/wsmp

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