

Data Sheet

W1 Connector™

W1 Adapter

W1 Termination

DC to 110 GHz



A complete coaxial connector system with mode-free performance to 110 GHz

Features

- Excellent RF Performance to 110 GHz
- 50Ω Impedance
- Low VSWR
- Standard 1 mm Interface
- Accurate Testing Capability
- Broadband Load for Instrument and Device Under Test

The W1 Connector™ family is a complete coaxial connector system with mode-free performance to 110 GHz.

It contains male and female hermetic and non-hermetic connectors, male and female broadband terminations and in-series adapters. Based on the 1.00 mm coaxial connector front side interface as specified by IEEE Std 287, the W1 Connector is well suited for high frequency applications ranging from components to systems and instrumentation.

W1-102F, W1-102M Connector Launchers

The W1 Connector launcher family includes both male and female W1 Connectors. The W1 Connector has an air dielectric interface similar to K and V connectors. The center conductor is supported by Anritsu's proprietary low-loss high temperature support bead on one end and a glass bead on the other end. The center conductor of the glass bead extends out of the connector backside and allows the user to make a direct pin overlap connection to the Microwave Circuit. The threads on the backside of the W1 Connector allow the user to install the W1 Connector by screwing it into the housing wall. Since Anritsu's proprietary low loss high temperature plastic bead is used, the user can solder the connector into the housing to achieve a hermetic connection. For details, please refer to the W1 Connector Installation procedures. Integrating the glass bead into the connector allows Anritsu to control the critical matching steps of the interface between the bead pin and the center conductor and bead pin to Microstrip or Coplanar Waveguide (CPW).

W1-105F, W1-105M Connector Launchers

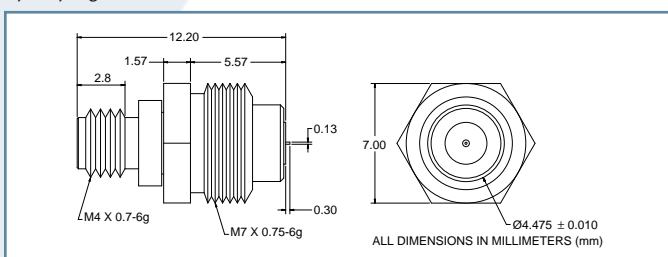
The W1 Connector launcher family includes both male and female screw-in type connectors. The W1 Connector has an air dielectric front-side interface similar to K and V connectors. The center conductor is supported by Anritsu's proprietary low-loss high temperature support bead on one end, and a Teflon bead on the other end to provide exceptional concentricity and rigidity to the pin on the backside. The use of a high temperature support bead allows the connector to be subjected to extended temperature ranges up to 200°C for a short period. A connector was subjected to 200°C for forty-eight hours and results showed no degradation in performance. The center conductor extends outside of the connector and allows the user to make a direct pin overlap connection to the microwave circuit.



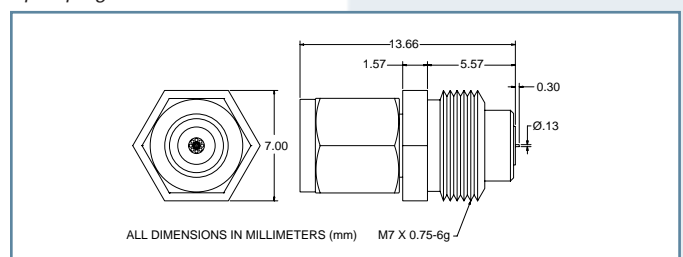
W1-102F, W1-105F, W1 Female Sparkplug Connector



W1-102M, W1-105M, W1 Male Sparkplug Connector



W1-102F, W1-105F, W1 Female Sparkplug Connector Outline Drawing



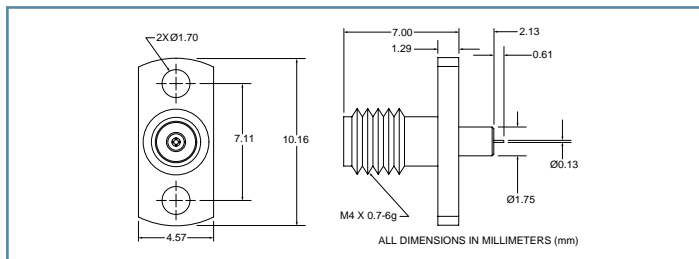
W1-102M, W1-105M, W1 Male Sparkplug Connector Outline Drawing

W1 Flange Mount Connector

W1 two-hole Flange Mount female connectors are also available. The center conductor of the connector is supported by a PPO® bead on the front-end and by a Teflon bead on the back end. The center conductor extends outside the connector, allowing for a direct pin overlap connection to the microwave circuit.



W1-103F, W1 Female Flange Connector



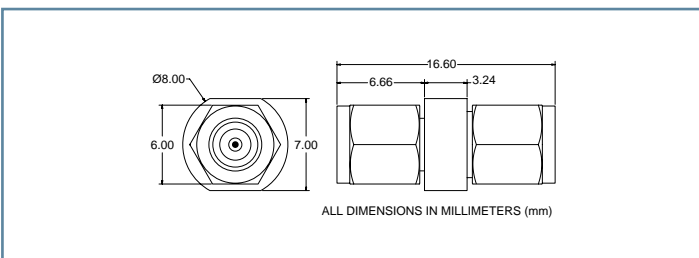
W1-103F, W1 Female Flange Connector Outline Drawing

W1 In-Series Adapter

The 33 series precision W1 Adapters enable accurate measurements with Anritsu W1 Connectors (1.0 mm connector) at a broad frequency range of up to 110 GHz. The 33 series W1-W1 Adapters are available in three connector sex configurations: M-M, M-F, and F-F. W1 Adapters have an air dielectric interface and a center conductor that is supported by a low loss PPO® plastic bead. When used as connector savers with test ports in test systems, these adapters protect the test port by reducing the number of connections.



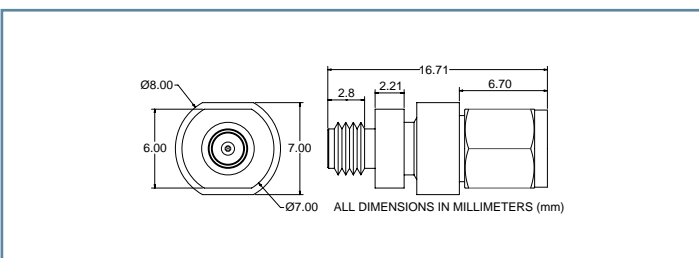
33WW50, Precision W1 Male to W1 Male Adapter



33WW50, Precision W1 Male to W1 Male Adapter Outline Drawing



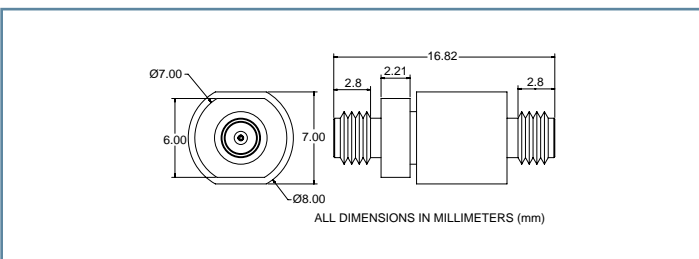
33WWF50, Precision W1 Male to W1 Female Adapter



33WWF50, Precision W1 Male to W1 Female Adapter Outline Drawing



33WFW50, Precision W1 Female to W1 Female Adapter



33WFW50, Precision W1 Female to W1 Female Adapter Outline Drawing

W1 Precision Termination

W1 Precision Metrology-grade Terminations are used in measurement systems that need to achieve the smallest possible reflections. Designed in both male and female configurations, these terminations can be used as a precision load for test instruments or devices under test.



28W50, W1 Male Precision Termination, DC-110 GHz



28WF50, W1 Female Precision Termination, DC-110 GHz

W1 Cable Connector, W1 Waveguide Adapters and W1-V Adapters

Both male and female cable connectors are available. W1 Cable connectors use the center conductor of a UT-42 cable and are ideal for connecting two modules together or connecting the device under test to the test port head of a test instrument. Please contact Anritsu for more details on this product.

The precision W1 Waveguide adapters transform standard WR10 and WR8 waveguide interfaces to precision coaxial W1 Connector interfaces, thus enabling convenient millimeter wave coaxial measurements. Please contact Anritsu for more details on this product.

W1-V adapters provide an interface between W1 Connectors and V Connectors and allow connections between two different connector types. Please contact Anritsu for more details on this product.

Tools



01-504, W1-6 mm Torque Wrench



01-506, W1-7 mm Torque Wrench



01-505, W1-6-7 mm Open end Wrench

Specifications: W1 Connector™

Impedance	50Ω
Frequency	DC to 110 GHz
Insertion Loss	0.70 dB typical
Return Loss	-16 dB to 110 GHz typical
Insulation Resistance	>1200 MΩ
Center Conductor Contact Resistance	6 mΩ typical
Maximum Power CW	6 W
Frontside Pin Depth	0 to 0.076 mm maximum
Backside Pin Protrusion	0.32 mm typical for W1-102F, W1-102M, W1-105F, W1-105M, 0.61 mm typical for W1-103F
Torque Coupling Nut	4 in-lb maximum
Torque W1 Connector Installation	5 in-lb maximum
Hermeticity (W1-102F, W1-102M)	1 x 10 ⁻⁸ std cc He/sec at atmosphere differential

Specifications: W1 Adapter

Electrical specifications given below are performance standards or limits against which the adapters are tested.

Model	Connectors	Frequency	Insertion Loss	Return Loss
33WW50 33WWF50 33WFW50	W1(m) to W1(m) W1(m) to W1(f) W1(f) to W1(f)	DC to 110 GHz	0.5 dB	-22 dB to 40 GHz -18 dB to 65 GHz -16 dB to 110 GHz

Specifications: W1 Precision Termination

Model	Frequency Range	Test Port Connector	Input Impedance	SWR	Dimensions Length x Diameter
28W50	DC - 110 GHz	W1 male	50Ω	1.0458 to 20 GHz 1.058 to 65 GHz 1.33 to 110 GHz	2.5 x 0.8 cm
28WF50	DC - 110 GHz	W1 female	50Ω	1.0515 to 20 GHz 1.0653 to 65 GHz 1.50 to 110 GHz	2.2 x 0.8 cm

Materials:

W1-102F W1-102M	Outer Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Outer Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Coupling Nut for W1-102M: Passivated stainless steel
	Glass Bead Center Pin: Kovar, gold plated over nickel per Mil-G-45204C
	Glass Bead Outer Conductor: Kovar, gold plated over nickel per Mil-G-45204C
	Glass Bead Dielectric: Corning 7070 glass
	Plastic Support Bead Dielectric: Proprietary
W1-105F W1-105M	Outer Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Center Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Coupling Nut for W1-105M: Passivated stainless steel
	Plastic Support Bead Dielectric: Proprietary
W1-103F	Outer Conductor: Passivated stainless steel
	Center Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Coupling Nut for W1-103F: Passivated stainless steel
	Plastic Support Bead Dielectric: Polyphenylene Oxide Noryl
33WW50 33WWF50 33WFWF50	Outer Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Coupling Nut: Passivated stainless steel
	Center Conductor: Beryllium-copper, gold plated over nickel per Mil-G-45204C
	Plastic Support Bead Dielectric: Proprietary

Environmental Information: Tests per MIL-STD-202F

Operating Temperature Range	0° to +85°C for W1-102F, W1-102M, W1-105F, W1-105M, W1-103F, 33WW50, 33WWF50, 33WFWF50
Storage Temperature Range	-54° to +125°C for W1-102F, W1-102M, W1-105F, W1-105M -54° to +85°C for W1-103F, 33WW50, 33WWF50, 33WFWF50
Temperature Shock	25° to -40° and 25° to +125°C, method 107G, condition B
Humidity	95% at 40°C, 96 hours, Test 103B, condition B, non operating only
Shock	100G peak sawtooth, method 213, test condition 1
Vibration	Sinewave: 10 Hz to 2000 Hz, 0.06" DA, method 204, test condition D Random: 50 Hz to 2000 Hz, 11.6 Grams, Power Spectral Density 0.1 Grams ² /Hz, Method 214, Test Condition I, Letter D
Salt Spray	5% concentration for 48 hours, Method 101D, Condition B
Dielectric Withstanding Voltage	500 Vac RMS, 60 seconds, method 301



SALES CENTERS:

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