

Directional Coupler, 0.5-2GHz, 10dB, SMA Female

WMC-0.5-2-10dB-S

Description

Model WMC-0.5-2-10dB-S from Werbel Microwave is a directional coupler that covers 500 MHz to 2 GHz with broadband flat coupling response, high directivity, and excellent return loss performance. Stripline design handles much higher power than equivalent core-and-wire models, while the enclosure remains minimally sized at 3.600 x 0.600 x 0.38 inches with SMA-Female connectors. The device is RoHS compliant, and Sn/Pb solder is available on special order. The device has coverage of the upper band of UHF as well as L-band. The mainline and coupled arm VSWR is 1.15:1 typical, minimizing reflections and leading to highly accurate measurements. Designed, assembled, and tested in the USA.



Photo is representative.

Specifications	Min.	Typ.	Max.	Units
Frequency	500	--	2000	MHz
Impedance	--	50	--	Ohm
Coupling	--	10 ± 1.0	--	dB
Frequency Sensitivity (Flatness)	--	± 0.75	± 1.00	dB
Mainline Loss ¹	--	0.6	0.9	dB
Directivity	23	25	--	dB
Main Line Return Loss	20	24	--	dB
Secondary Line Return Loss	20	23	--	dB
Isolation	--	35	--	dB
Forward Power (CW) ²	--	--	50	Watt
Reverse Power (CW) ²	--	--	5	Watt
Termination Power	--	--	1	Watt

Mechanical

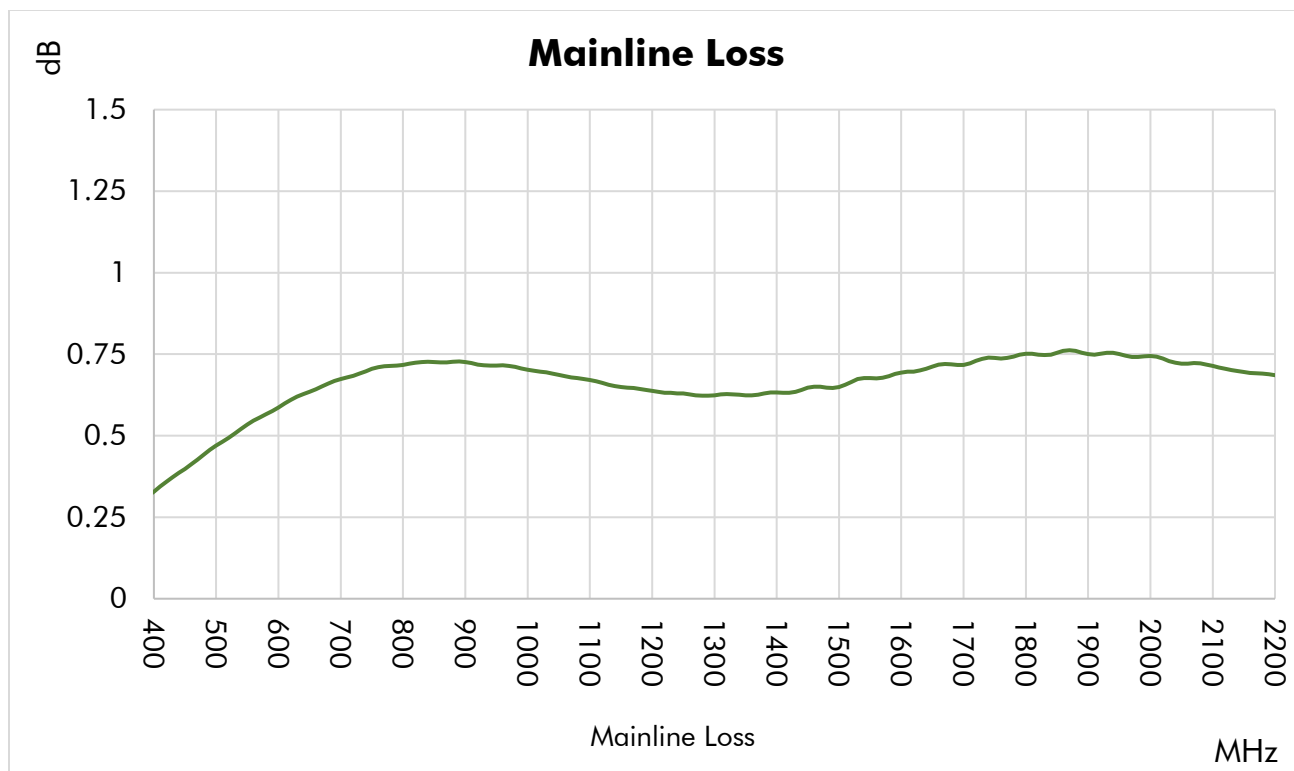
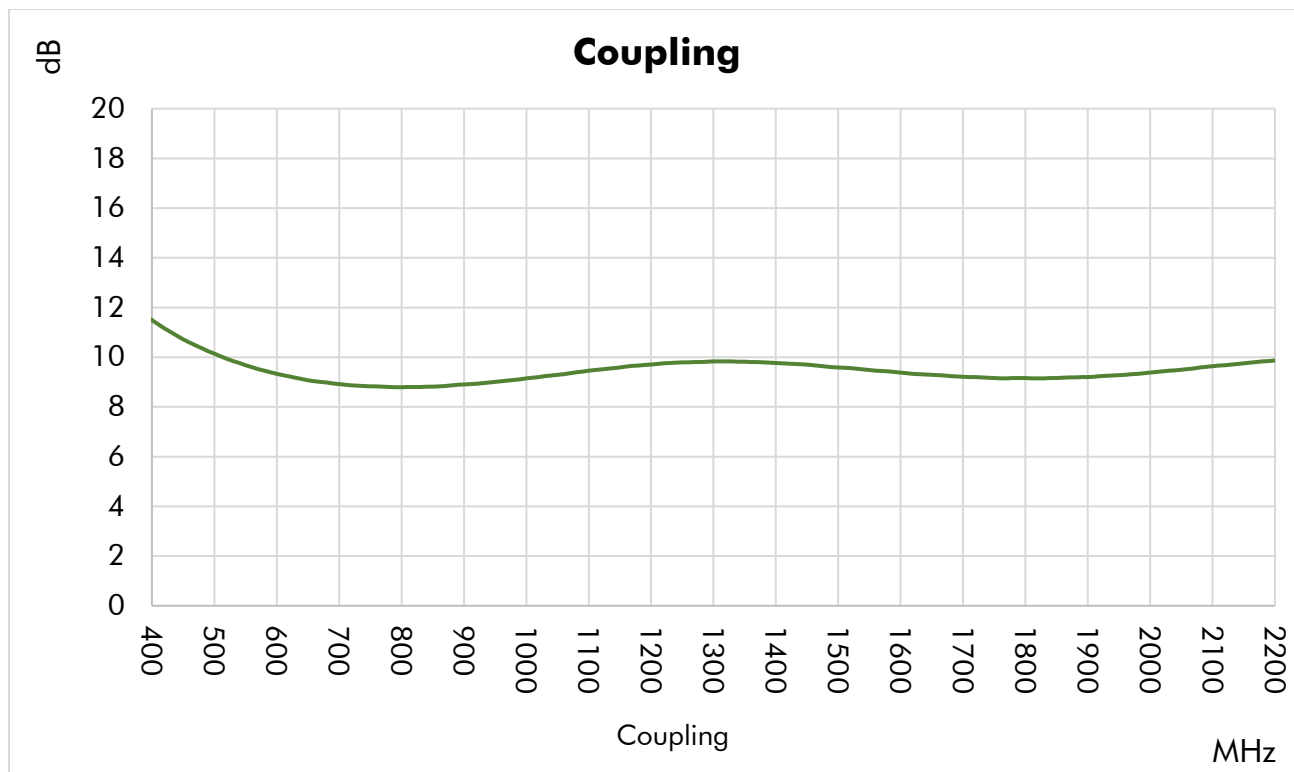
Connector Interface	SMA-Female
Operating Temperature ³	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	1.5 oz (42 g)
Humidity	10-90% non-condensing
Environment	Indoor Use Only

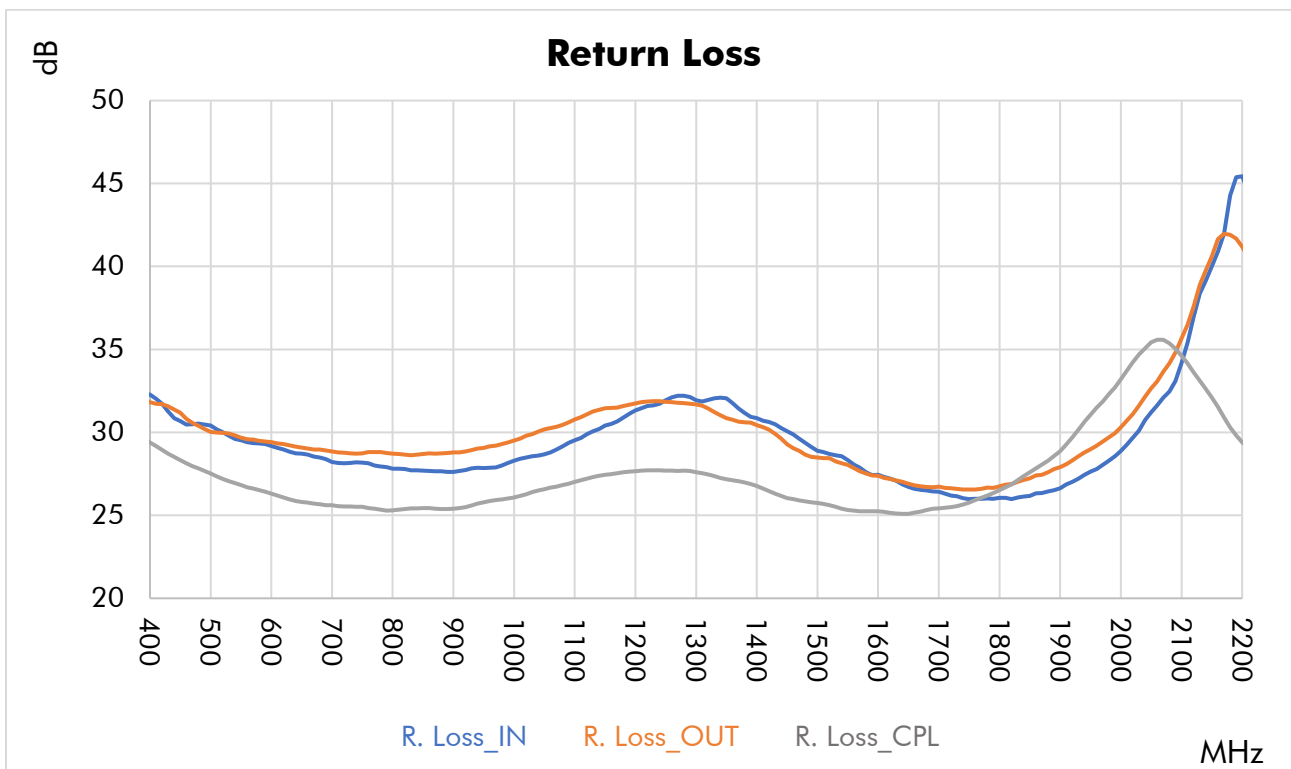
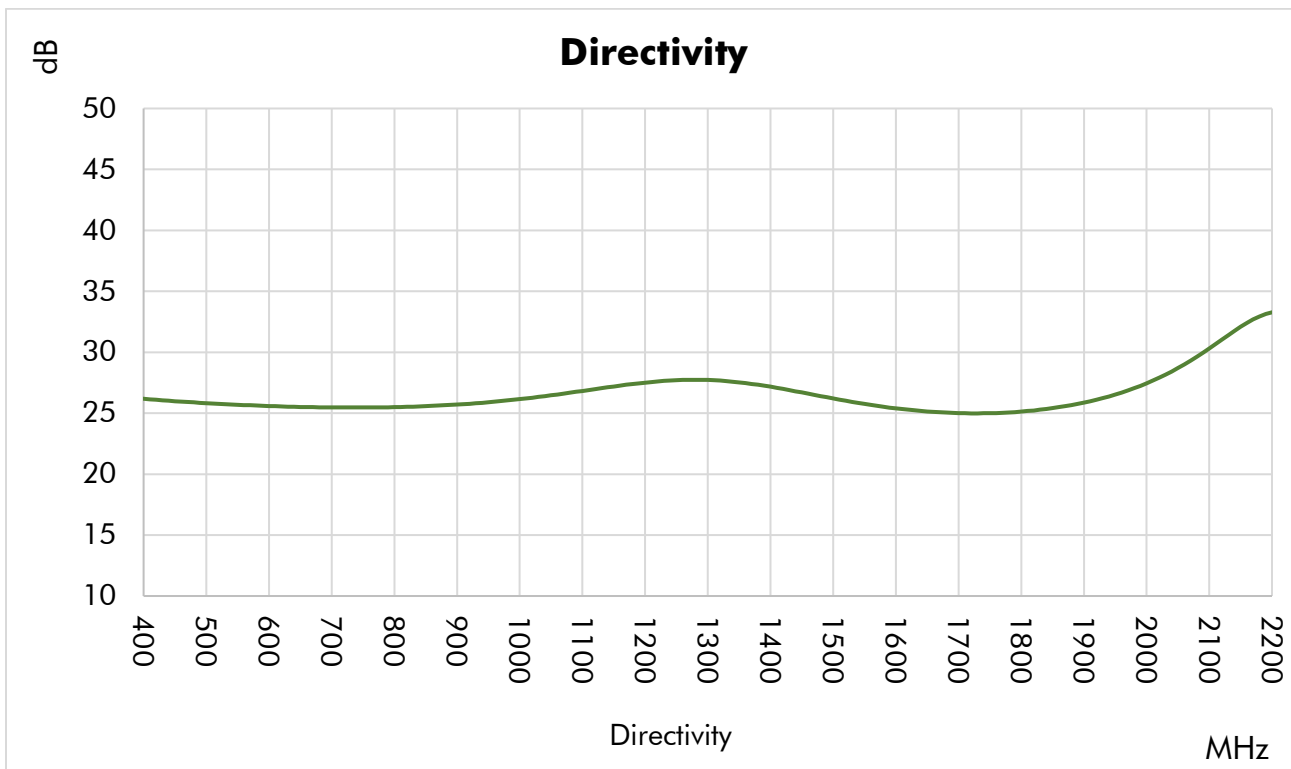
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication.

Materials

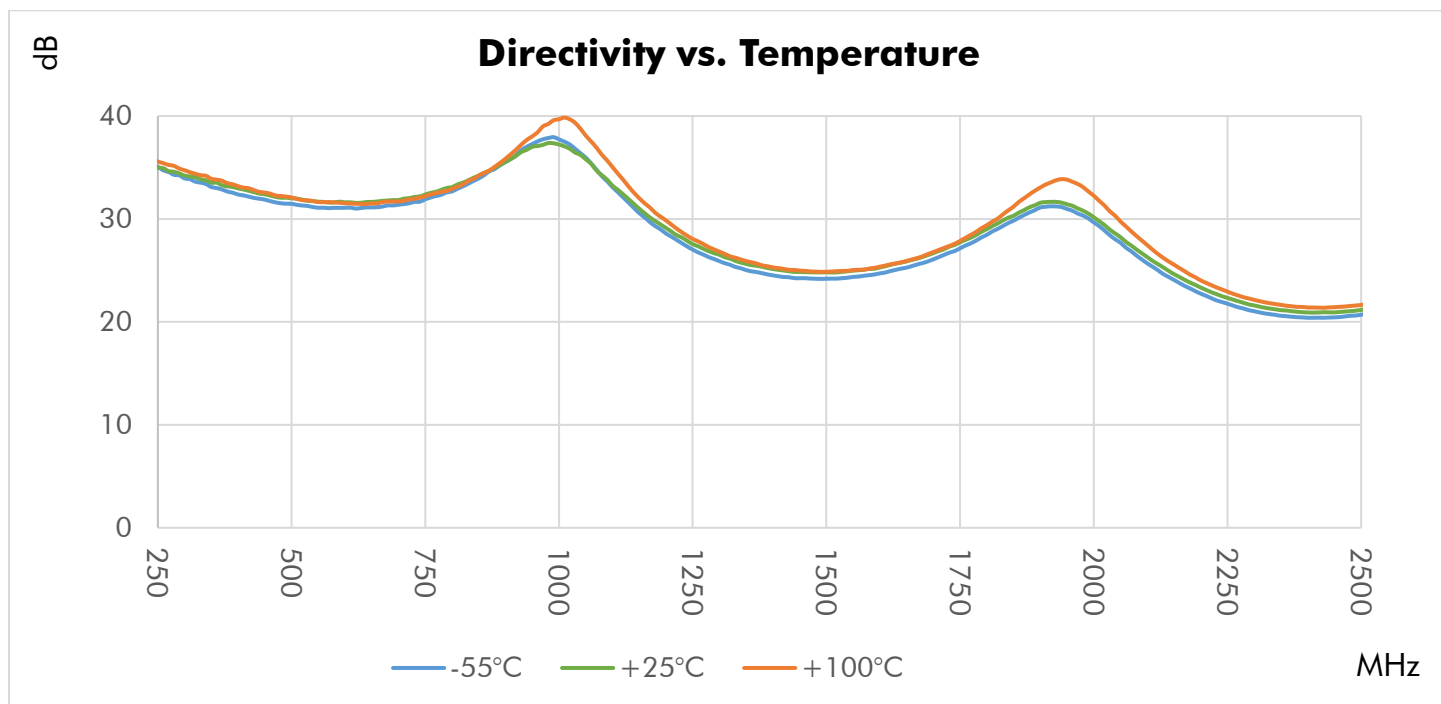
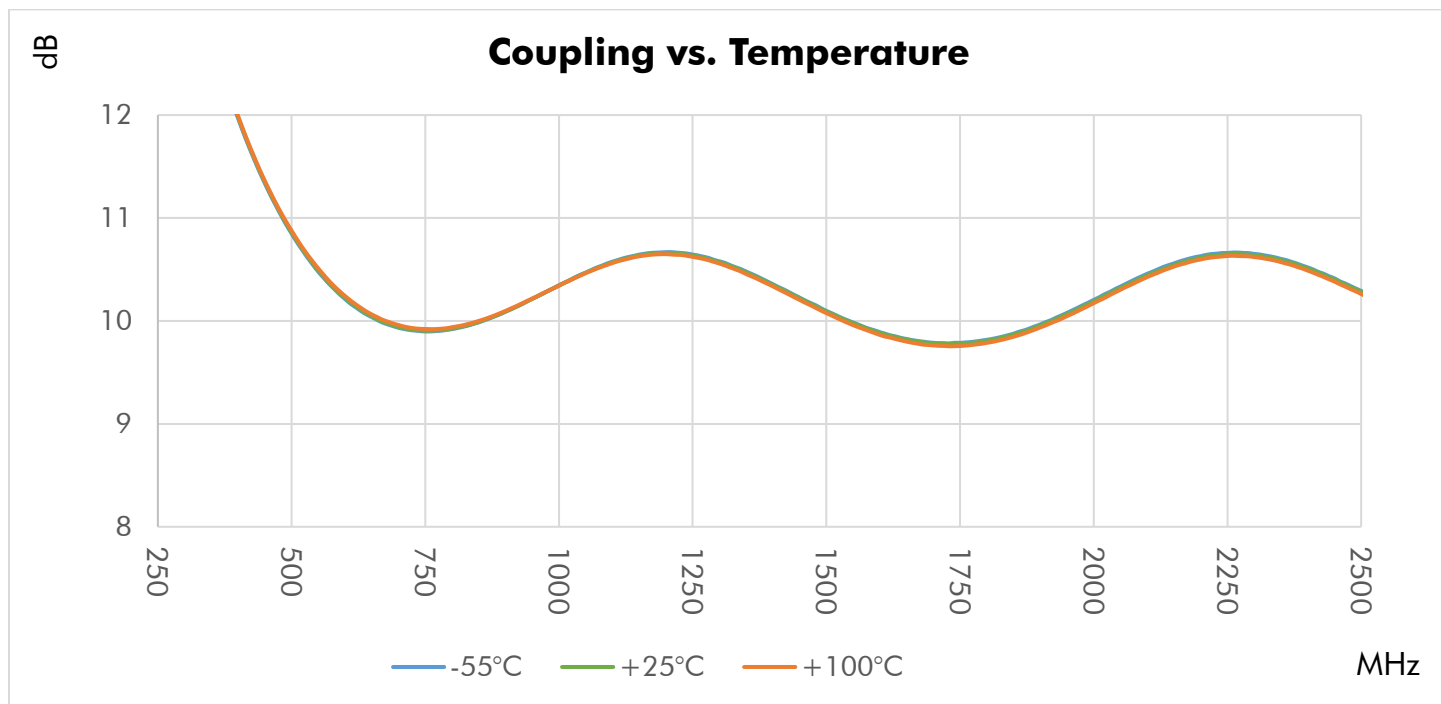
RoHS and REACH Compliant ⁴	
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

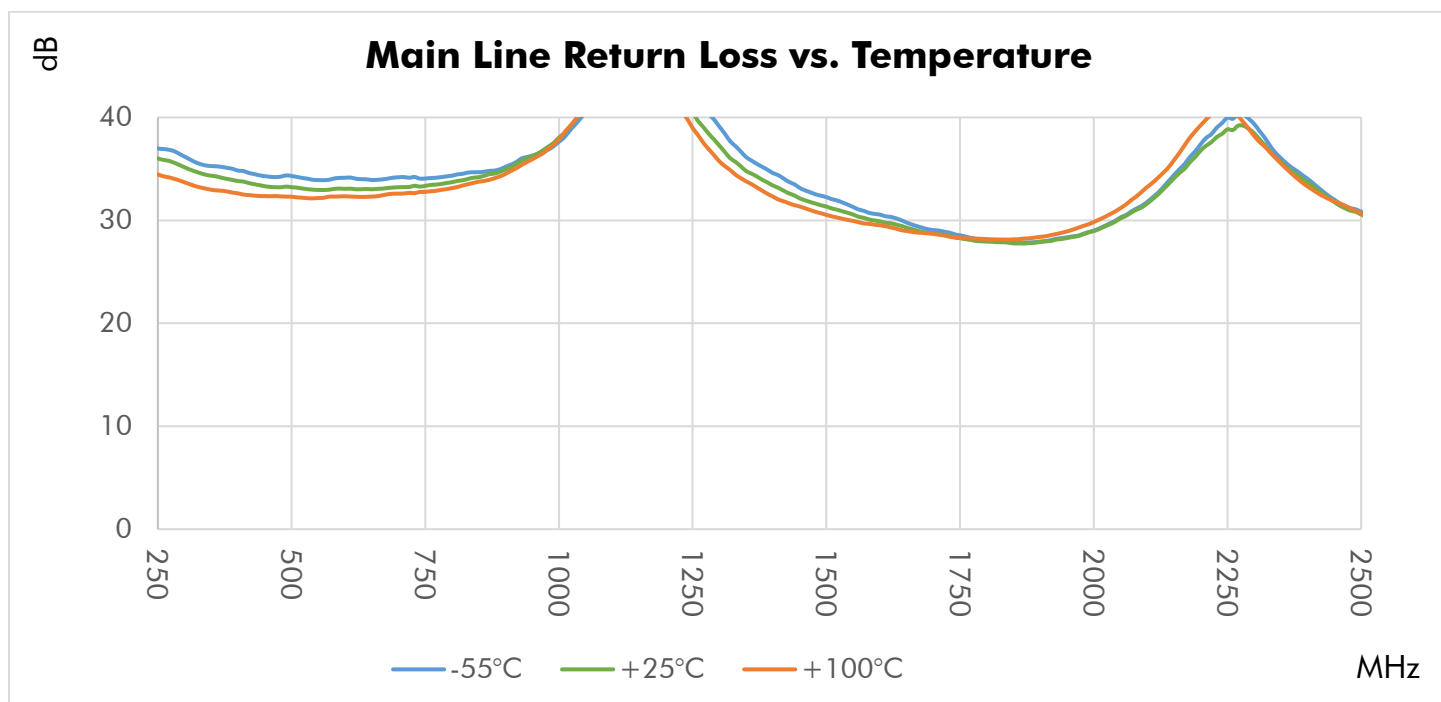
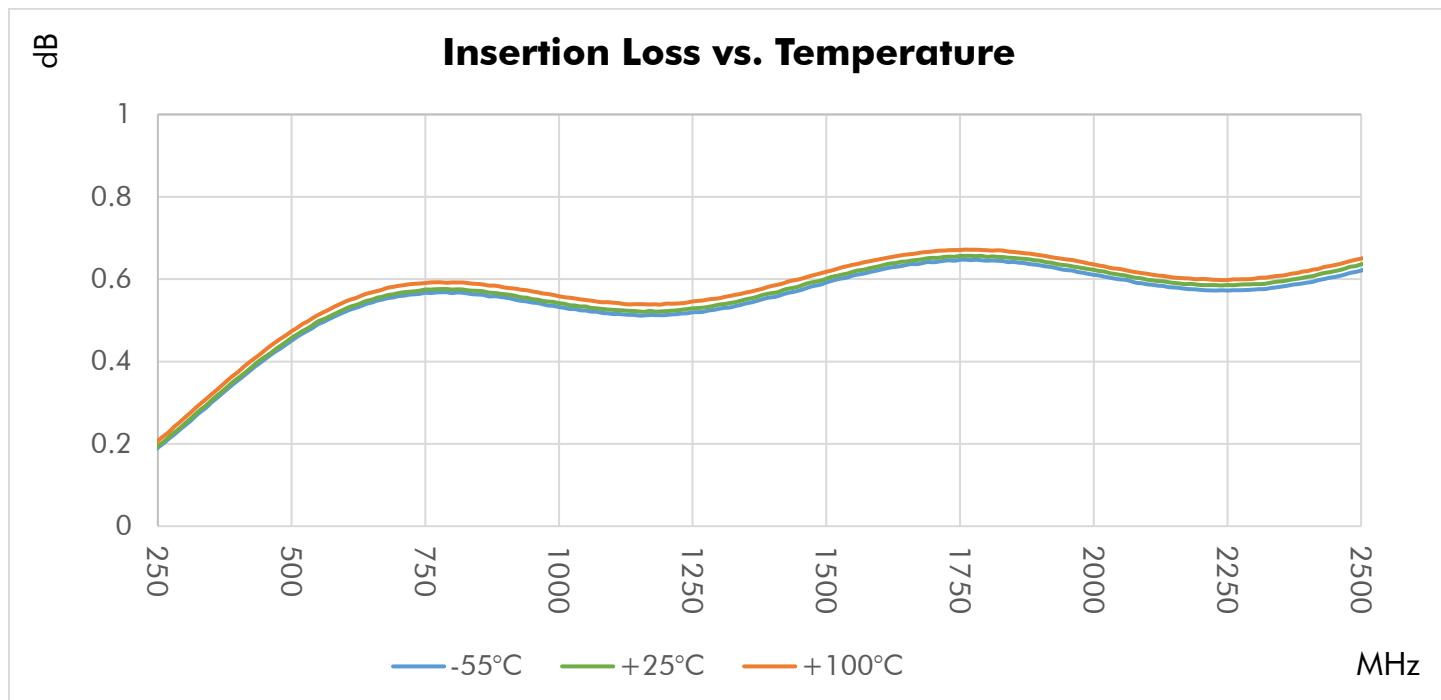
Typical Performance at +25 °C





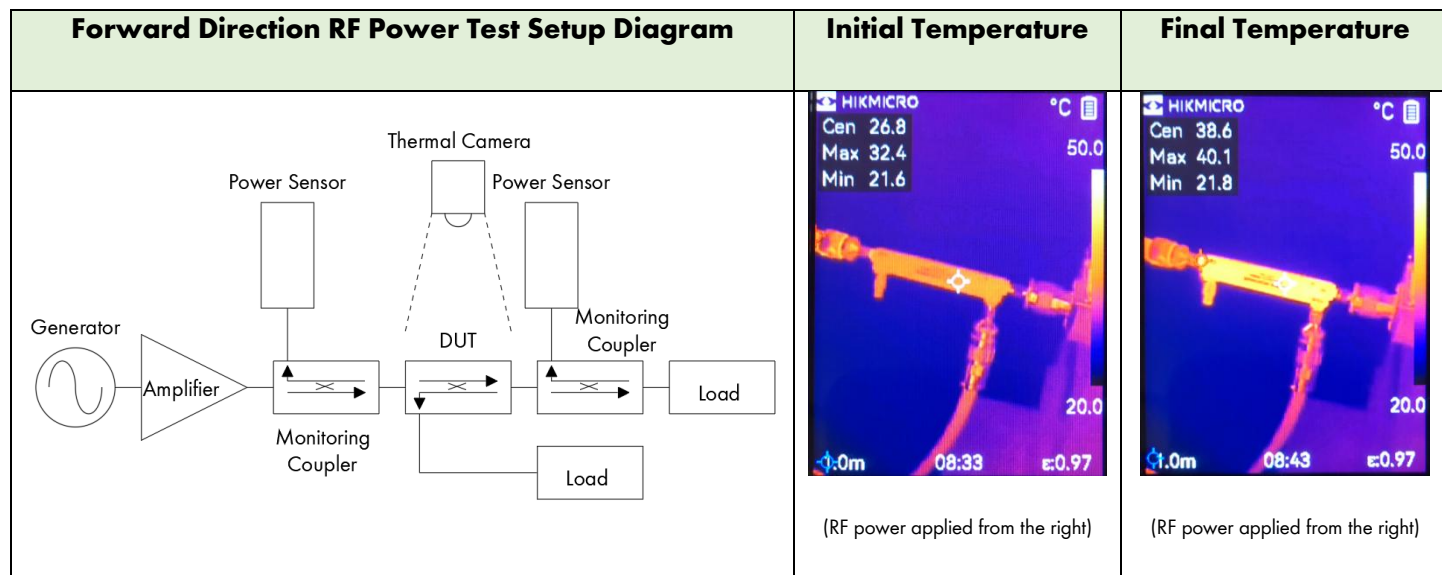
Typical Performance Over Temperature



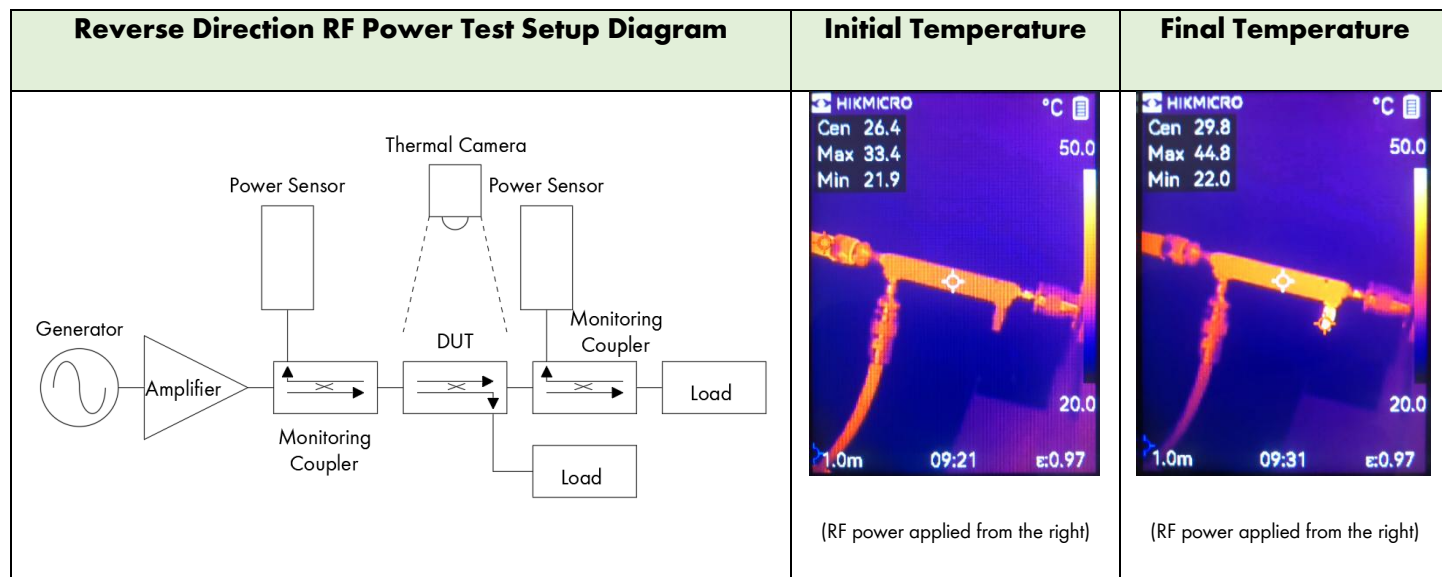


Reliability Testing

The RF power test was performed in both forward and reverse direction.



- 100 watts CW at 500MHz was applied to the DUT input for a duration of 10 minutes.
- The DUT temperature increased from 26.8°C (initial, center marker) to 40.1°C (final, max marker), resulting in a 13.3°C rise.

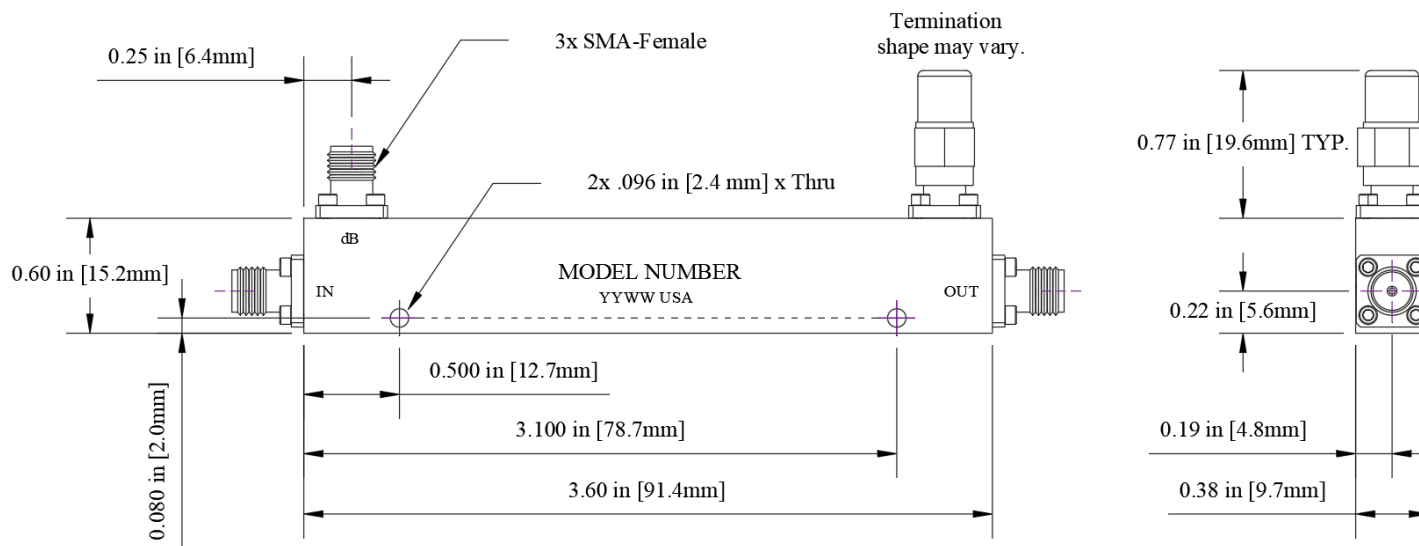


- 8 watts CW at 500MHz was applied to the DUT output for a duration of 10 minutes.
- The DUT temperature increased from 26.4°C (initial, center marker) to 44.8°C (final, max marker), resulting in an 18.4°C rise.
- The DUT termination was receiving an estimated power of 0.8W, based on a 10dB coupling factor.

Typical Performance Data

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
400	31.9	31.9	28.9	0.5	10.9	25.9
500	30.1	29.4	27.1	0.6	9.8	25.6
600	28.9	29.1	26.0	0.7	9.1	25.5
700	27.9	28.4	25.7	0.7	8.8	25.5
800	27.8	28.6	25.5	0.7	8.8	25.6
900	27.7	29.0	25.5	0.7	9.0	26.0
1000	28.5	30.0	26.3	0.7	9.2	26.7
1100	29.7	31.4	27.3	0.7	9.6	27.5
1200	31.6	32.2	27.7	0.6	9.8	27.9
1300	31.7	31.4	27.4	0.7	9.9	27.4
1400	30.8	29.7	26.3	0.6	9.7	26.3
1500	28.8	28.7	25.6	0.7	9.5	25.4
1600	27.4	27.2	25.1	0.7	9.3	25.0
1700	26.5	26.7	25.4	0.8	9.2	25.0
1800	26.2	27.2	27.0	0.8	9.2	25.6
1900	26.7	28.4	29.9	0.7	9.2	27.0
2000	29.3	31.6	34.7	0.7	9.5	29.6
2100	36.3	39.2	33.3	0.7	9.7	33.7
2200	43.4	39.5	28.7	0.7	9.9	33.0

Outline Dimensions



Outline # OL-1002

Dimensions are in inches, [mm] shown for convenience.

Tolerances on 2-pl decimals: $\pm .03$. 3-pl decimals: $\pm .015$.

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Reliability testing was performed as an internal requalification of the product to substantiate the published specifications, which were previously arrived at by calculation and/or similarity to existing products. The results of these tests are provided as a courtesy and shall not form part of a contract or warranty. While reliability tests may depict the product being tested beyond the published specification ratings for the purpose of stress testing the product, this does not imply that the product should be operating above the rated limits for any length of time. Specifications related to reliability (e.g., performance over temperature, power handling, DC current, HI-POT) are "designed to meet" and are not individually tested in production of commercially available products. Please contact a Werbel Microwave LLC Applications Engineer if specific reliability testing is needed on a particular product.