

Directional Coupler, 0.3-8GHz, 10dB, SMA Female

WMC-0.3-8-10dB-S

Description

Model WMC-0.3-8-10dB-S from Werbel Microwave is a directional coupler that covers 300 MHz to 8 GHz with broadband flat coupling response, high directivity, and excellent return loss performance. Frequency sensitivity is ± 0.6 dB typical. High directivity of 25dB typical. Mainline insertion loss of 1.3dB typical includes loss due to coupling factor. Return loss 23dB typical. Aluminum enclosure measures 6.00 x 0.73 x 0.50 inches with threaded mounting holes. SMA Female connectors. The device is RoHS compliant but may be special ordered with Lead solder to support military applications.



Photo is representative.

Specifications		Min.	Typ.	Max.	Units
Frequency		300	--	8000	MHz
Impedance		--	50	--	Ohm
Coupling		--	10 $\pm$ 1.2	--	dB
Frequency Sensitivity (Flatness)		--	$\pm$ 0.6	$\pm$ 1.2	dB
Mainline Loss ¹		--	1.3	1.7	dB
Directivity	300-6000MHz	19	25	--	dB
	6000-8000MHz	17	22	--	dB
Main Line Return Loss	300-6000MHz	20	25	--	dB
	6000-8000MHz	17	23	--	dB
Secondary Line Return Loss	300-6000MHz	20	24	--	dB
	6000-8000MHz	17	21	--	dB
Isolation		--	35	--	dB
Forward Power (CW) ²		--	--	20	Watts
Reverse Power (CW) ²		--	--	4	Watts
Termination Power (CW)		--	--	1	Watt

Mechanical

Connector Interface	SMA-Female
Operating Temperature ³	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	3.5 oz (86 g)
Humidity	10-90% non-condensing
Environment	Indoors Use Only

Materials

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

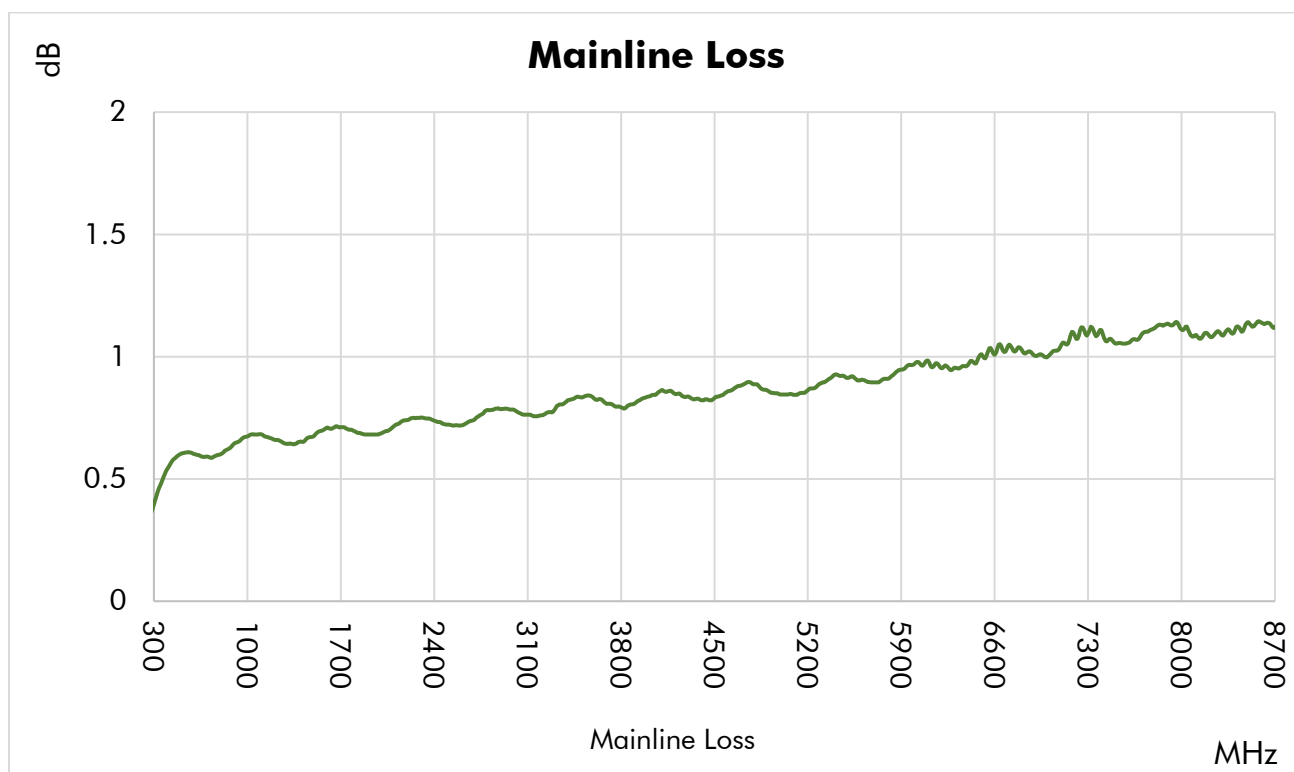
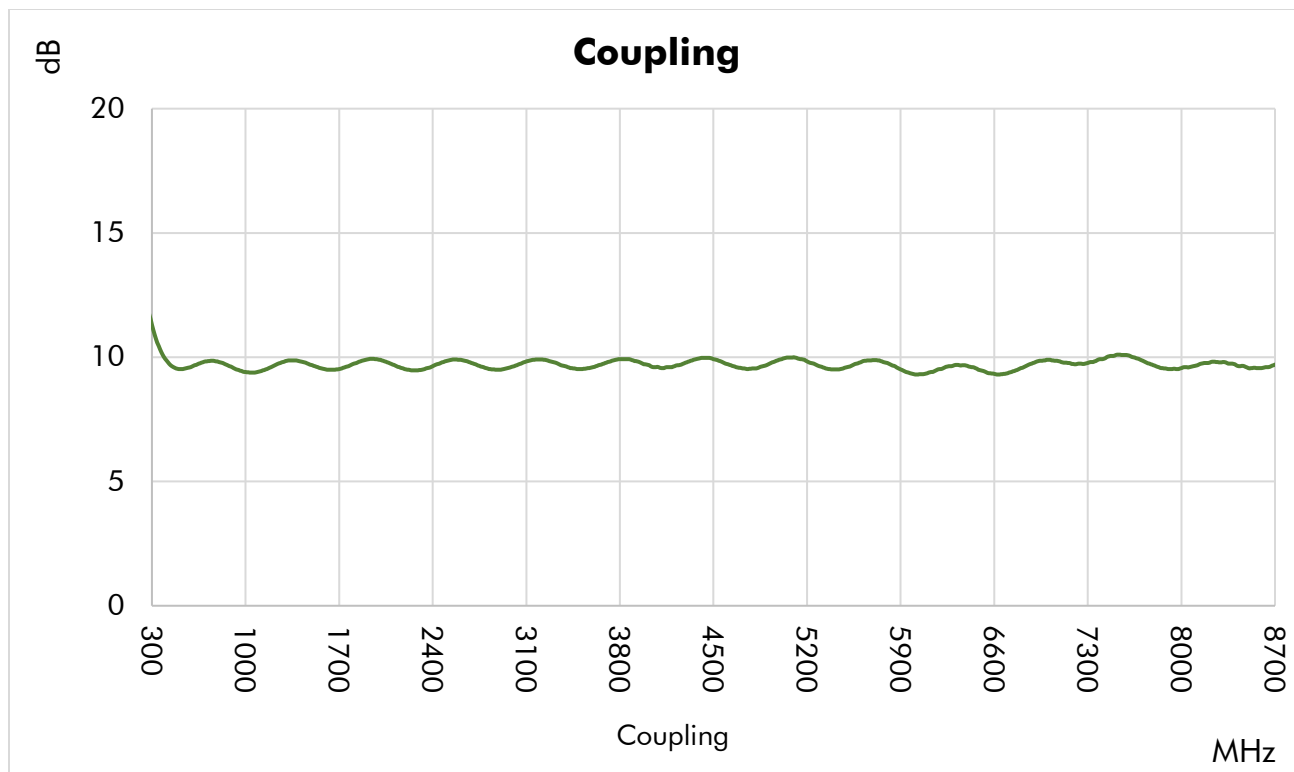
1. Mainline loss includes coupling loss.

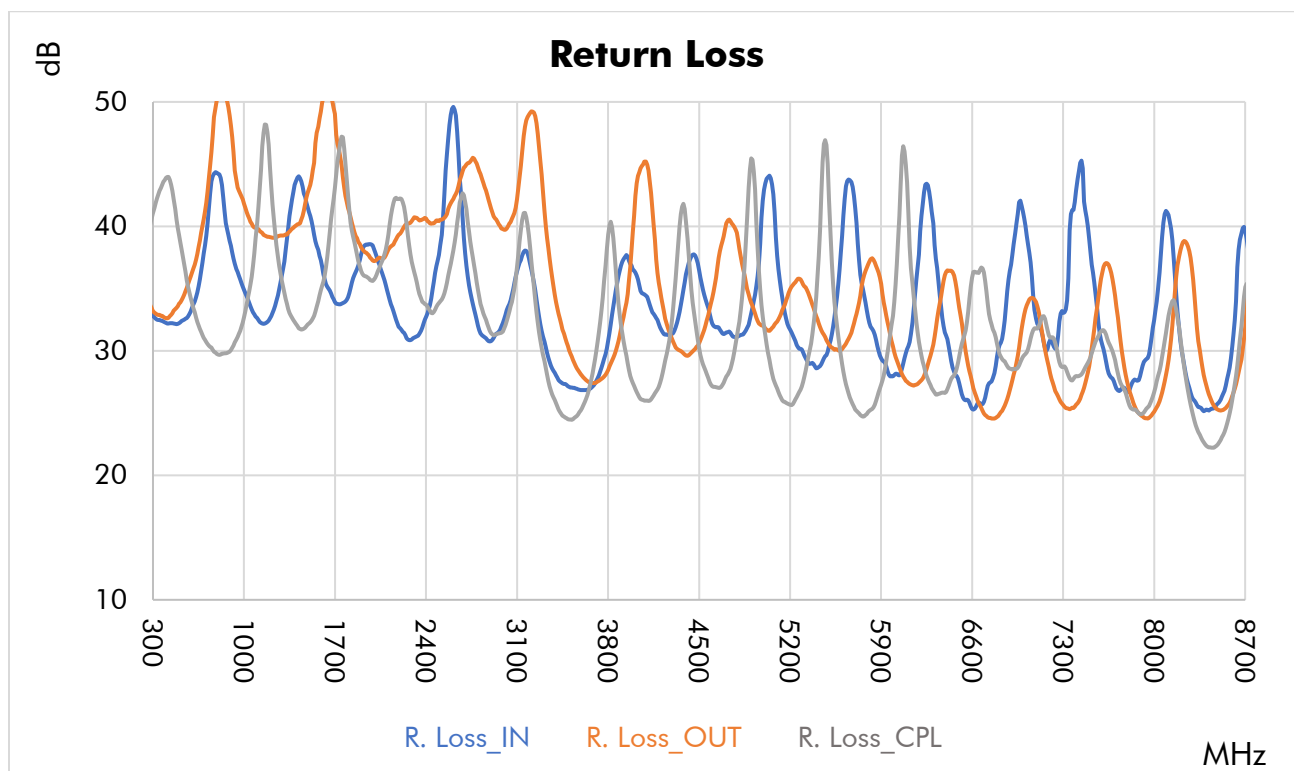
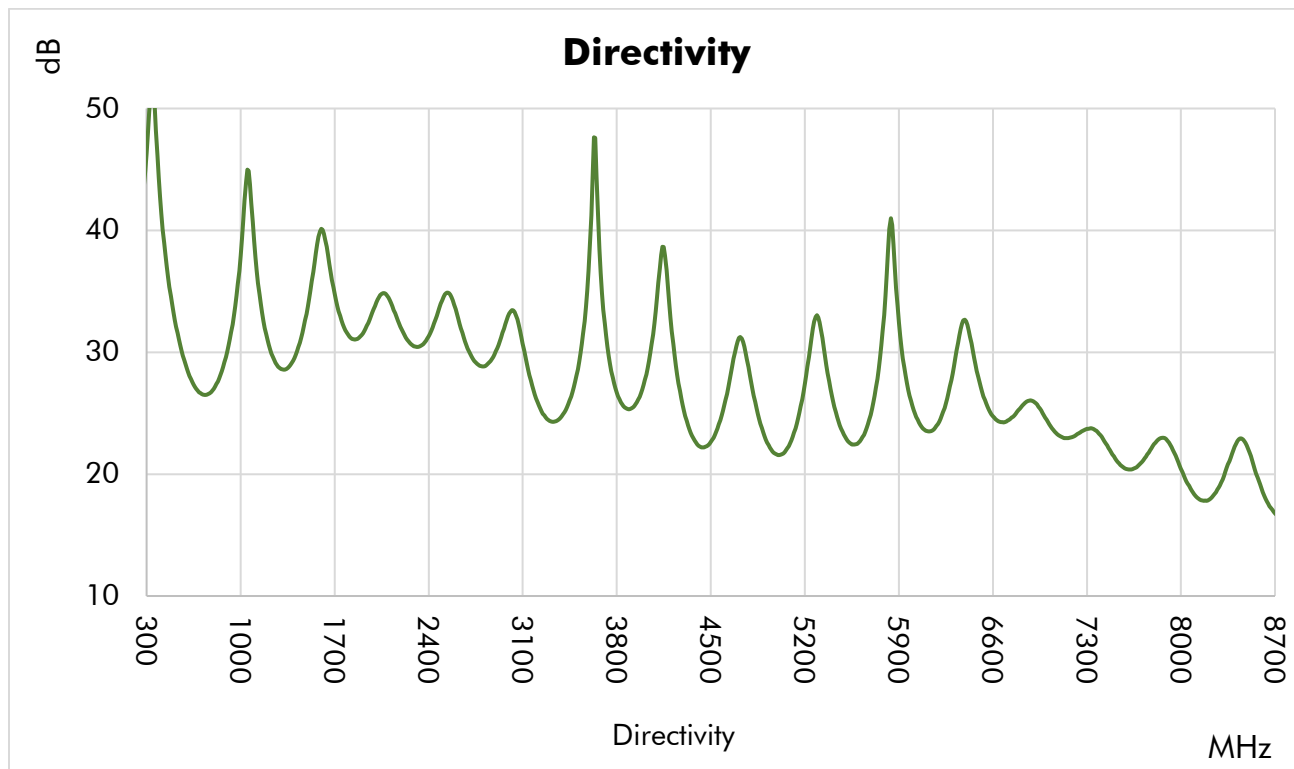
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.

3. Electrical specifications at +25 °C only.

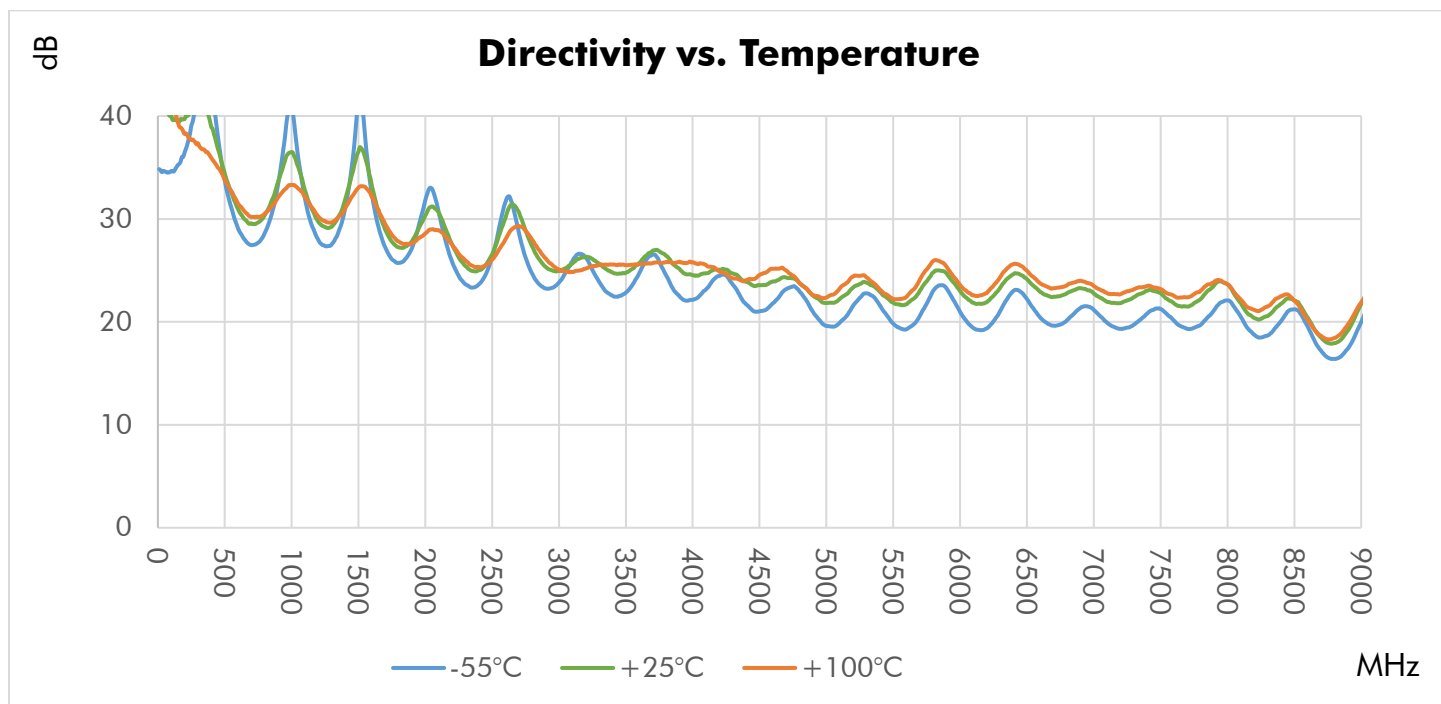
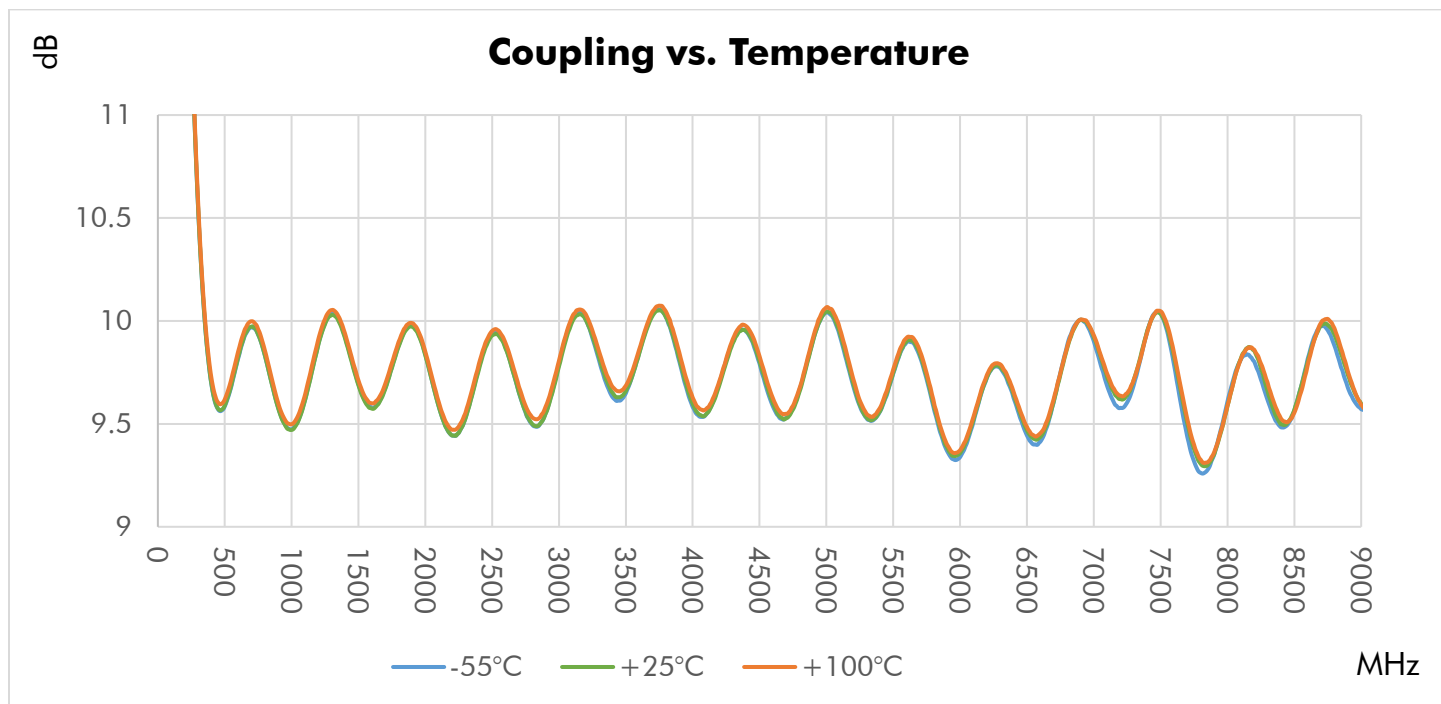
4. To the best of our knowledge at the time of publication.

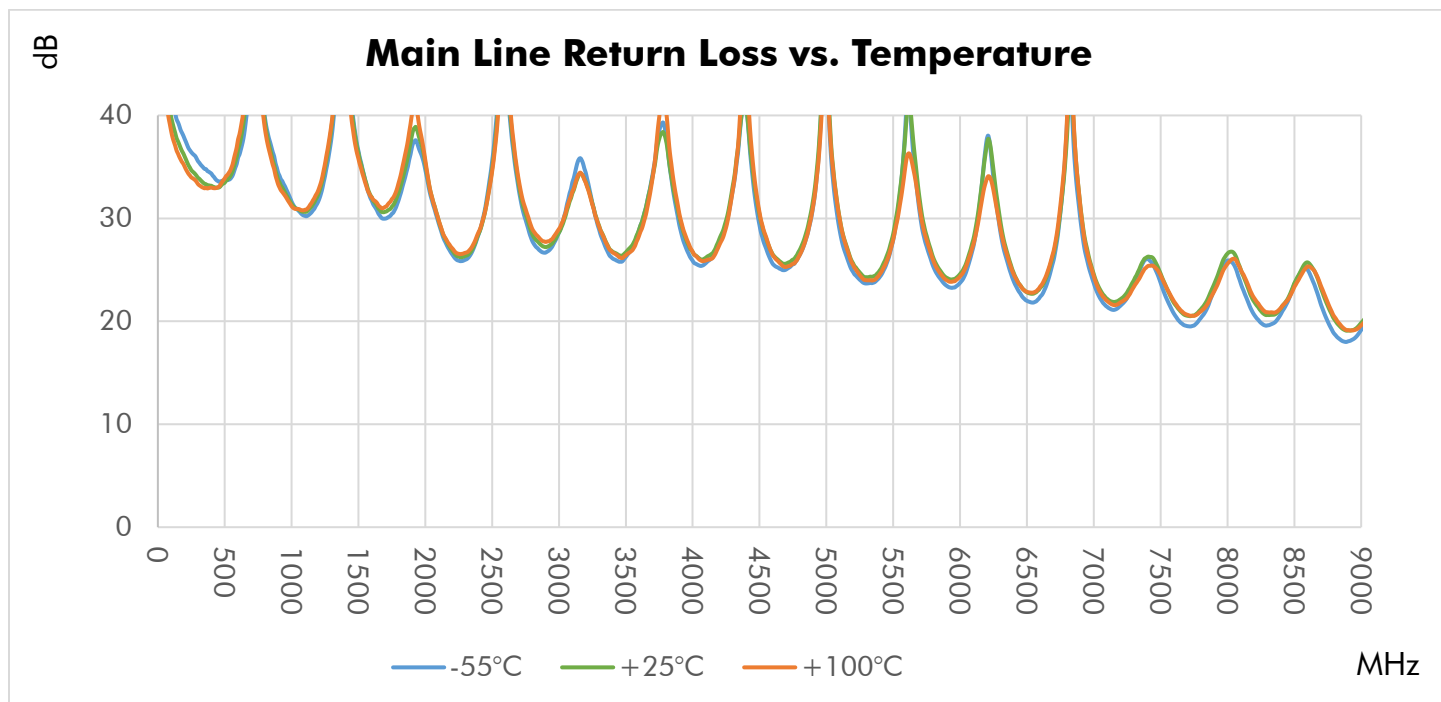
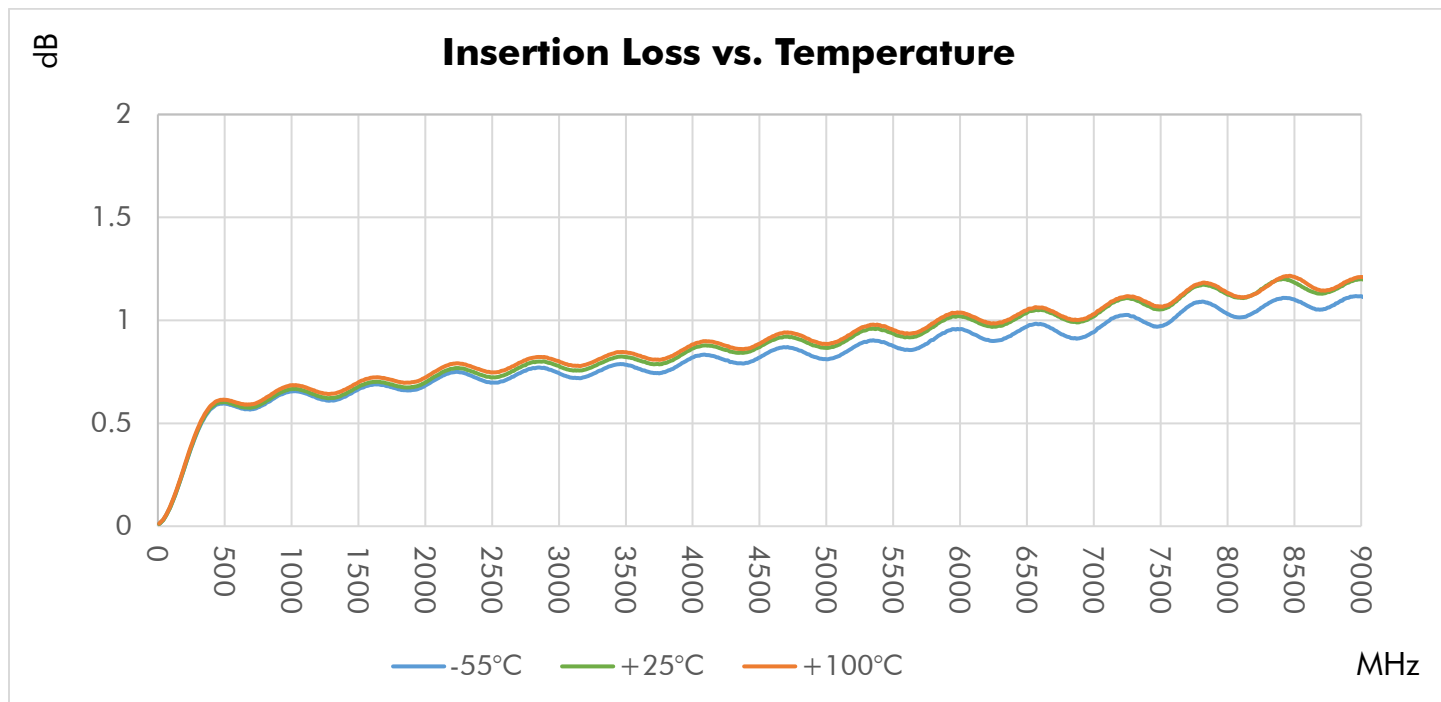
Typical Performance at +25 °C





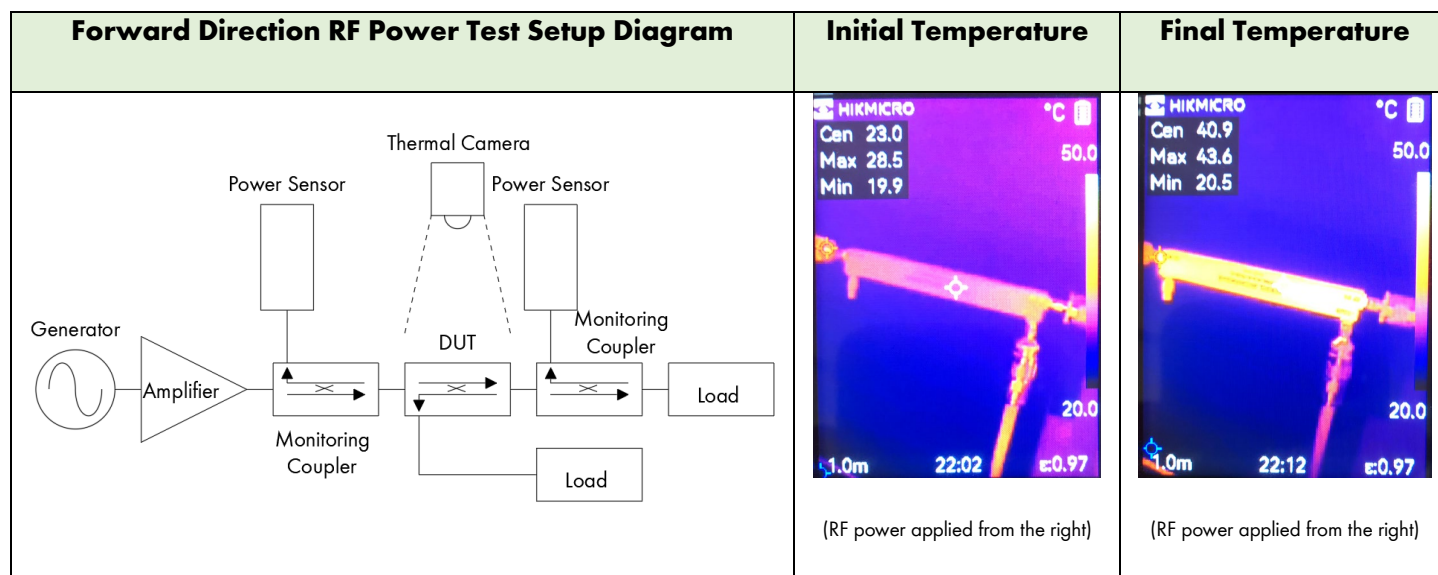
Typical Performance over Temperature



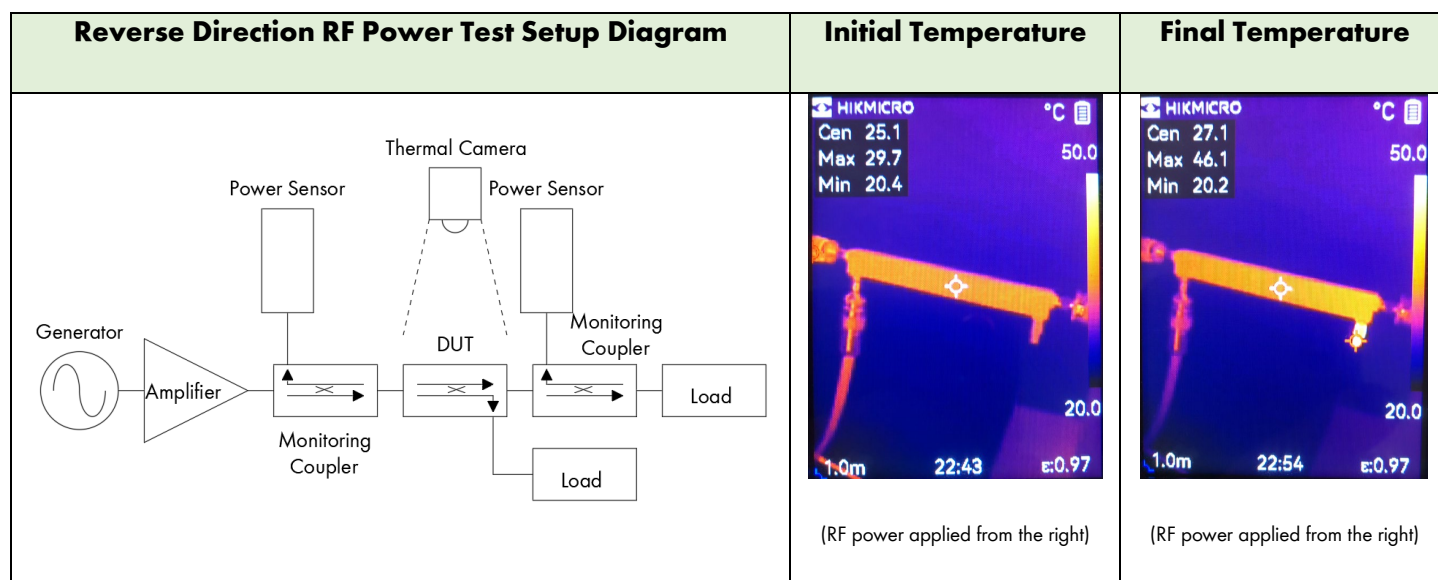


Reliability Testing

RF power test was performed to determine the input power required to produce a nominal temperature rise of 20°C at the hottest point. The test was performed at room temperature without forced air. A heatsink was not used unless it came standard with the product.



- 200 watts CW at 500MHz was applied to the DUT input for a duration of 10 minutes.
- The DUT temperature increased from 23.0°C (initial, center marker) to 43.6°C (final, max marker), resulting in a 20.6°C rise.

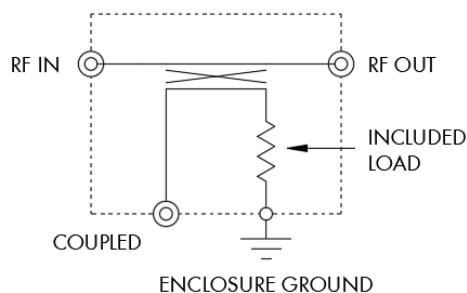


- 8 watts CW at 500MHz was applied to the DUT output for a duration of 10 minutes.
- The DUT temperature increased from 25.1°C (initial, center marker) to 46.1°C (final, max marker), resulting in a 21.0°C rise.
- The DUT termination was receiving an estimated power of 0.8W, based on a 10dB coupling factor.

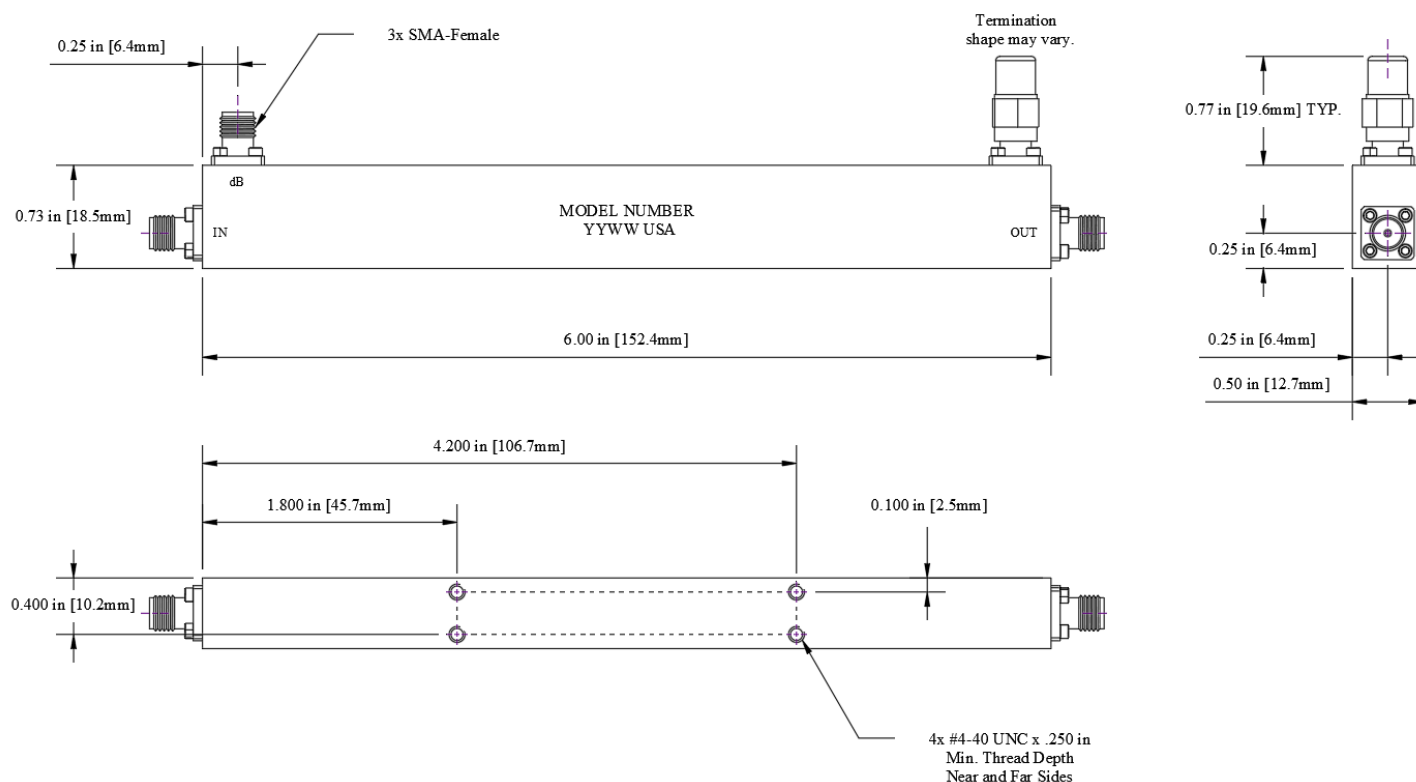
Typical Performance Data

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
300	32.1	31.3	42.6	0.5	10.5	47.1
500	32.4	36.4	38.5	0.6	9.6	32.9
700	41.8	46.3	30.7	0.6	9.8	26.6
900	36.3	42.0	30.5	0.7	9.5	30.3
1100	32.2	38.8	43.4	0.7	9.5	38.5
1300	39.2	38.5	33.8	0.7	9.9	28.6
1500	40.8	46.5	32.4	0.7	9.6	34.1
1700	33.3	41.7	45.6	0.7	9.6	34.5
1900	39.9	37.5	35.9	0.7	9.9	31.5
2100	32.6	40.4	40.4	0.7	9.6	34.4
2300	31.6	41.0	35.8	0.8	9.5	30.4
2500	39.8	38.6	33.8	0.7	9.9	34.4
2700	34.6	44.4	39.8	0.8	9.7	29.9
2900	31.1	39.4	31.2	0.8	9.5	30.2
3100	38.5	50.8	39.5	0.8	9.9	30.4
3300	29.2	35.0	28.3	0.8	9.8	24.3
3500	26.9	27.9	24.5	0.9	9.5	28.3
3700	28.5	28.0	30.9	0.8	9.9	32.9
3900	37.6	36.6	30.7	0.8	9.7	25.4
4100	33.2	35.1	25.9	0.9	9.6	35.1
4300	32.3	29.4	36.8	0.8	9.9	25.0
4500	33.2	33.3	28.9	0.9	9.8	22.7
4700	31.3	41.9	28.2	0.9	9.6	31.1
4900	36.0	31.7	44.1	0.9	9.8	23.0
5100	33.1	33.3	26.2	0.8	10.0	22.9
5300	28.7	32.8	28.8	0.9	9.5	32.7
5500	33.2	29.7	35.2	0.9	9.7	23.0
5700	34.8	36.4	25.0	0.9	9.9	25.6
5900	28.2	31.0	28.0	0.9	9.5	31.9
6100	31.9	27.0	36.4	1.0	9.5	23.6
6300	33.2	35.4	26.2	1.0	9.7	28.5
6500	25.2	27.1	31.3	1.0	9.4	27.3
6700	28.5	24.3	33.0	1.1	9.4	24.4
6900	39.9	31.2	28.6	1.0	9.8	25.9
7100	30.6	28.2	32.0	1.1	9.7	23.1
7300	33.4	26.3	28.9	1.0	9.9	23.7
7500	32.2	33.5	29.9	1.0	10.1	21.4
7700	25.7	28.5	27.7	1.2	9.8	21.0
7900	30.8	24.2	25.4	1.2	9.4	22.7
8100	35.2	34.1	33.9	1.1	9.8	18.3
8300	25.4	28.0	23.9	1.0	10.0	19.4
8500	26.9	25.4	23.1	1.3	9.4	21.9
8700	30.6	42.6	35.8	1.1	9.7	16.7

Simplified Electrical Schematic



Outline Dimensions



Outline # OL-1830

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.