

## Directional Coupler, 0.5-2GHz, 20dB, SMA Female

## WMC-0.5-2-20dB-S

### Description

Model WMC-0.5-2-20dB-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. Very low insertion loss of 0.25dB typical, and higher power handling than equivalent core-and-wire designs. Mainline and coupled port VSWR is 1.15:1 typical, making for high measurement accuracy with minimal reflections. This device is 3.6 inches long and has stainless steel SMA connectors. This model is RoHS compliant, however lead solder is available on special order. Covers L-band and UHF. Assembled and tested in USA.



Photo is representative.

Specifications	Min.	Typ.	Max.	Units
Frequency	500	--	2000	MHz
Impedance	--	50	--	Ohm
Coupling	--	20 ± 1.0	--	dB
Frequency Sensitivity (Flatness)	--	± 0.50	± 0.75	dB
Mainline Loss <sup>1</sup>	--	0.25	0.35	dB
Directivity	23	26	--	dB
Return Loss (In and Out)	20	23	--	dB
Return Loss (Coupling)	20	23	--	dB
Isolation	--	46	--	dB
Input Power (CW) <sup>2</sup>	--	--	50	Watt
Termination Power	--	--	1	Watt

### Mechanical

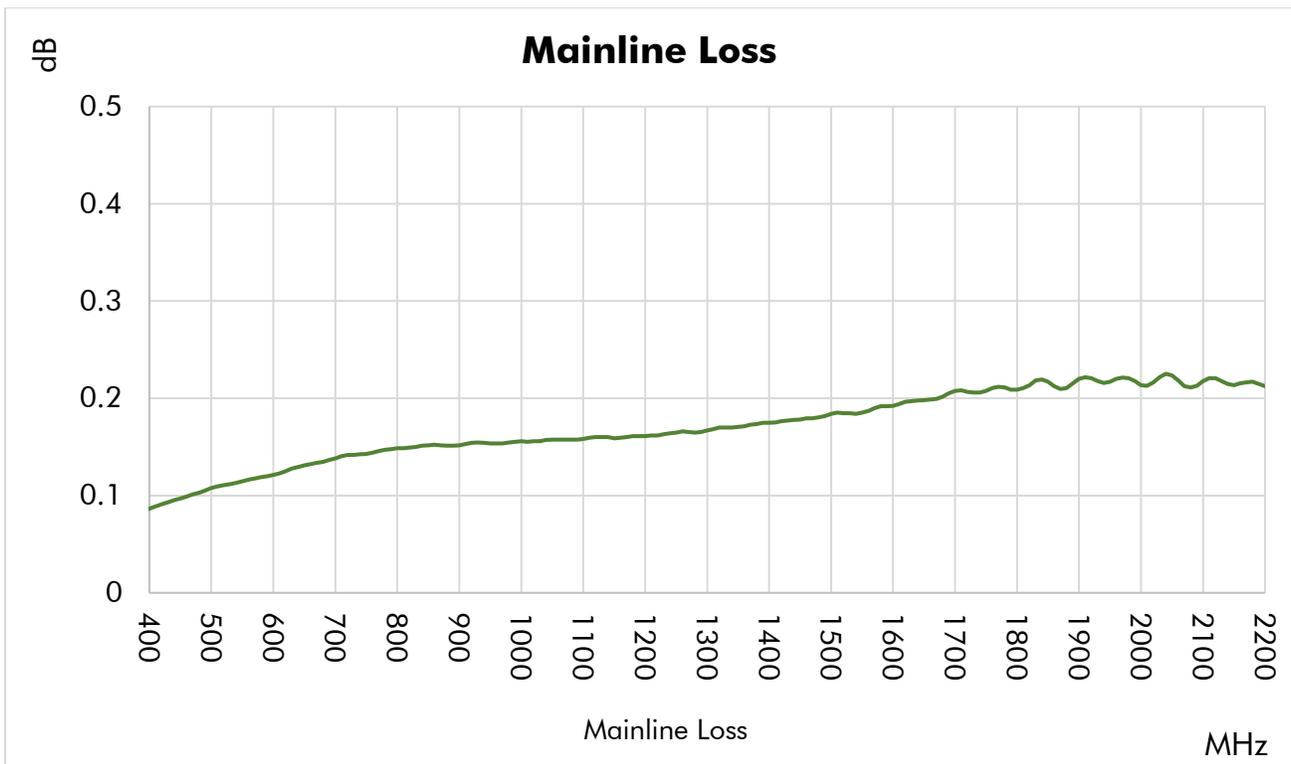
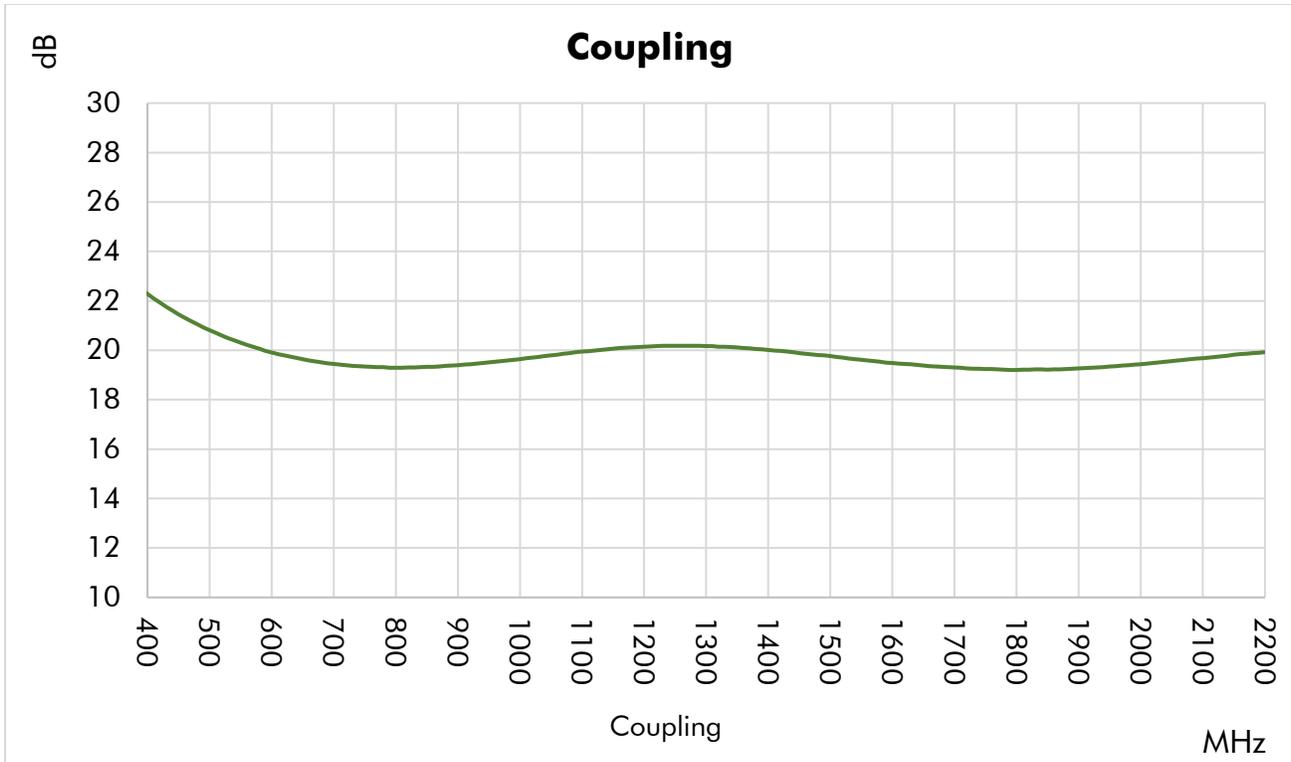
Connector Interface	SMA-Female
Functional Temperature <sup>3</sup>	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	1.6 oz (45 g)
Humidity	10-90% non-condensing
Environment	Indoor Use Only

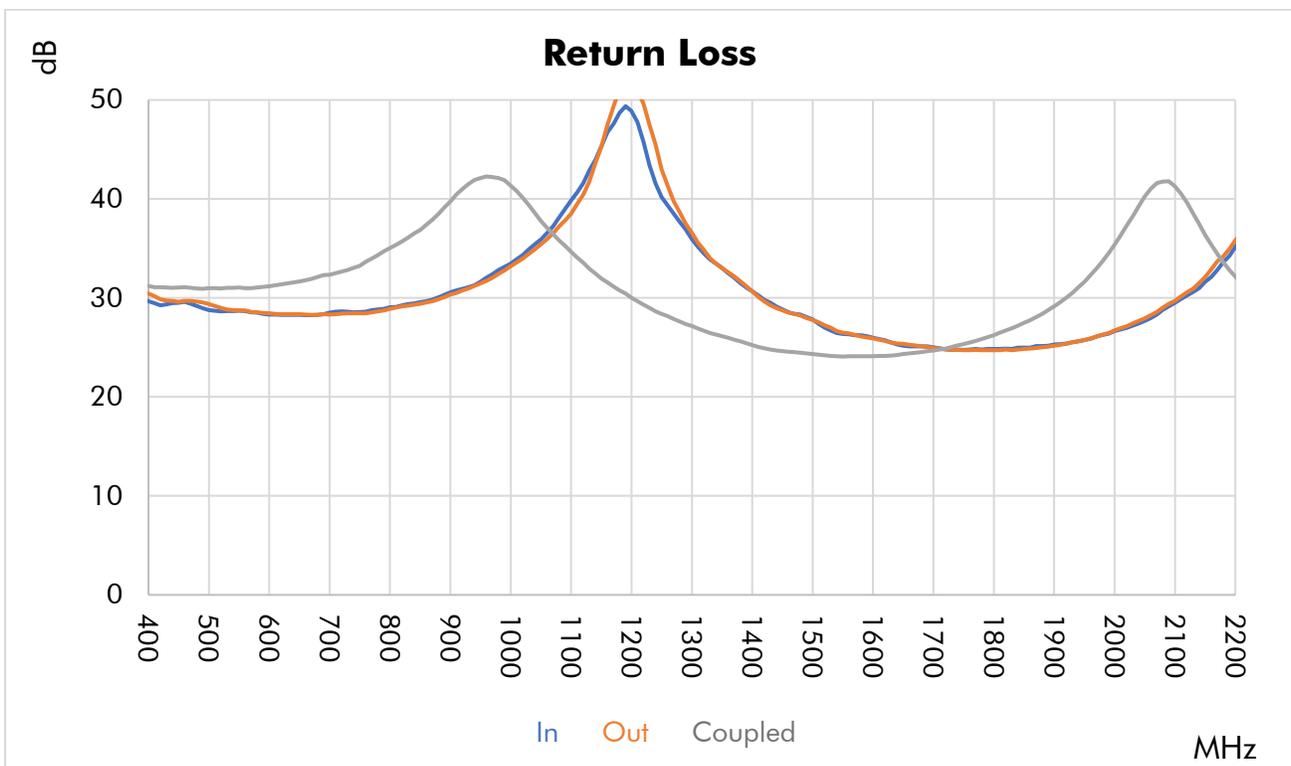
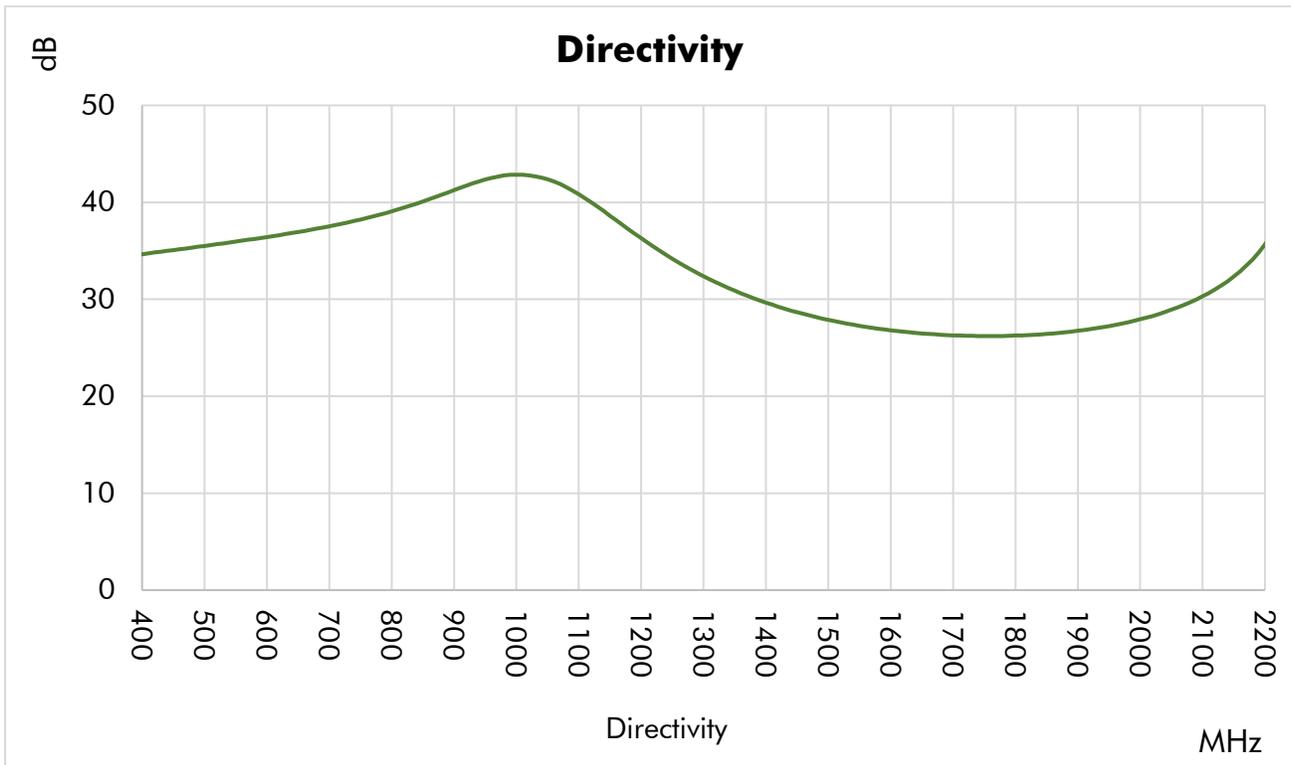
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication.

### Materials

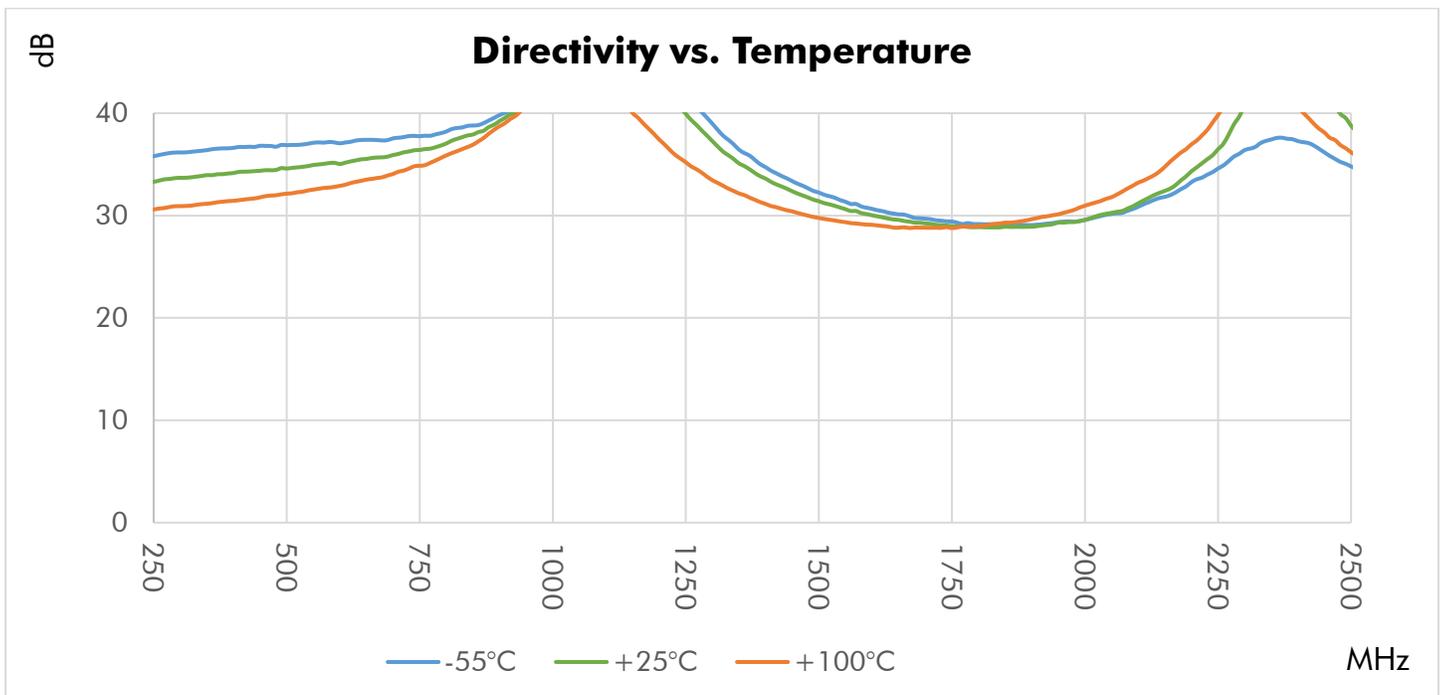
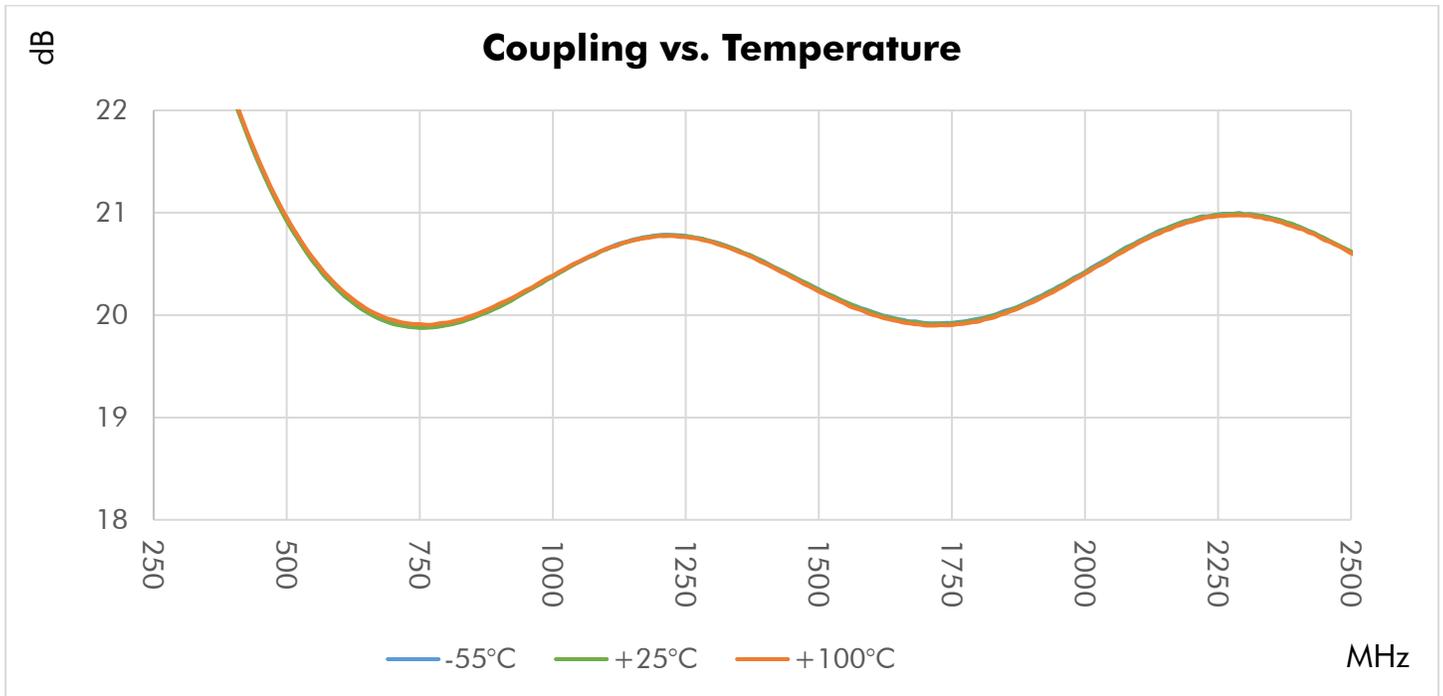
RoHS and REACH Compliant <sup>4</sup>	
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

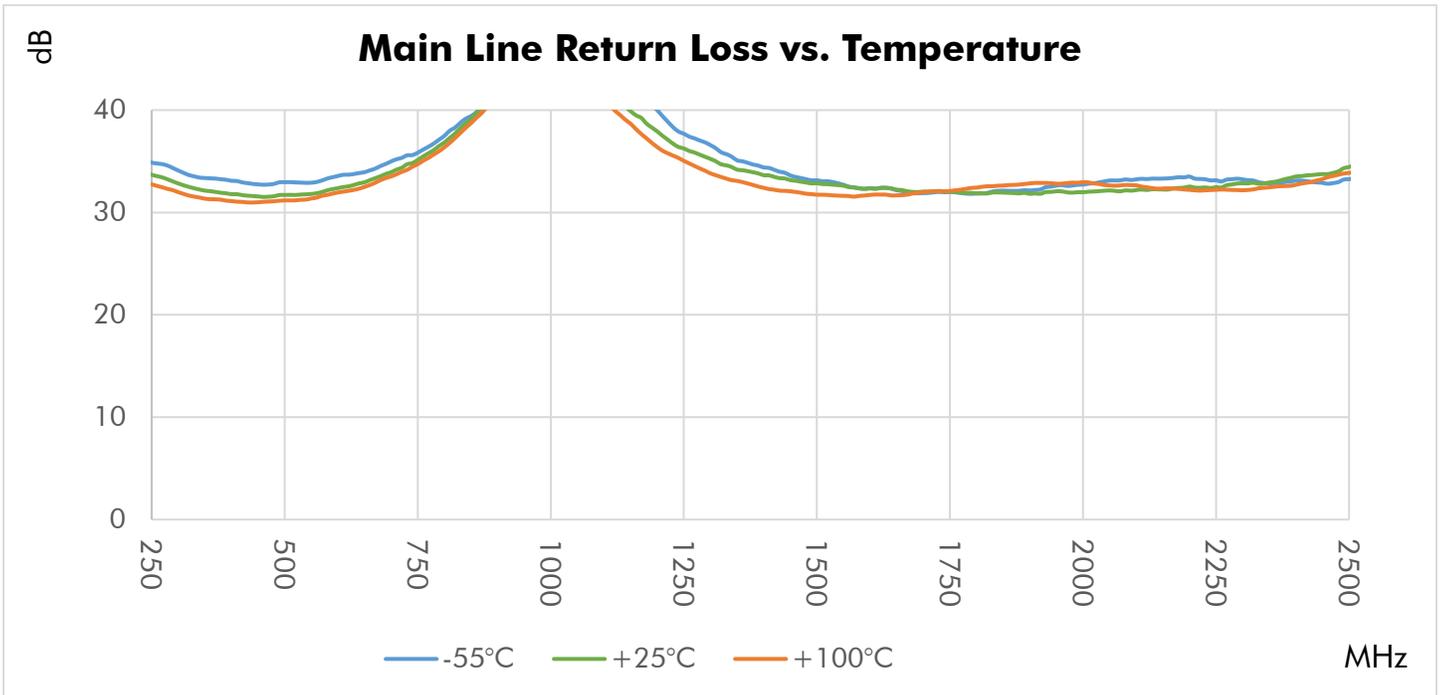
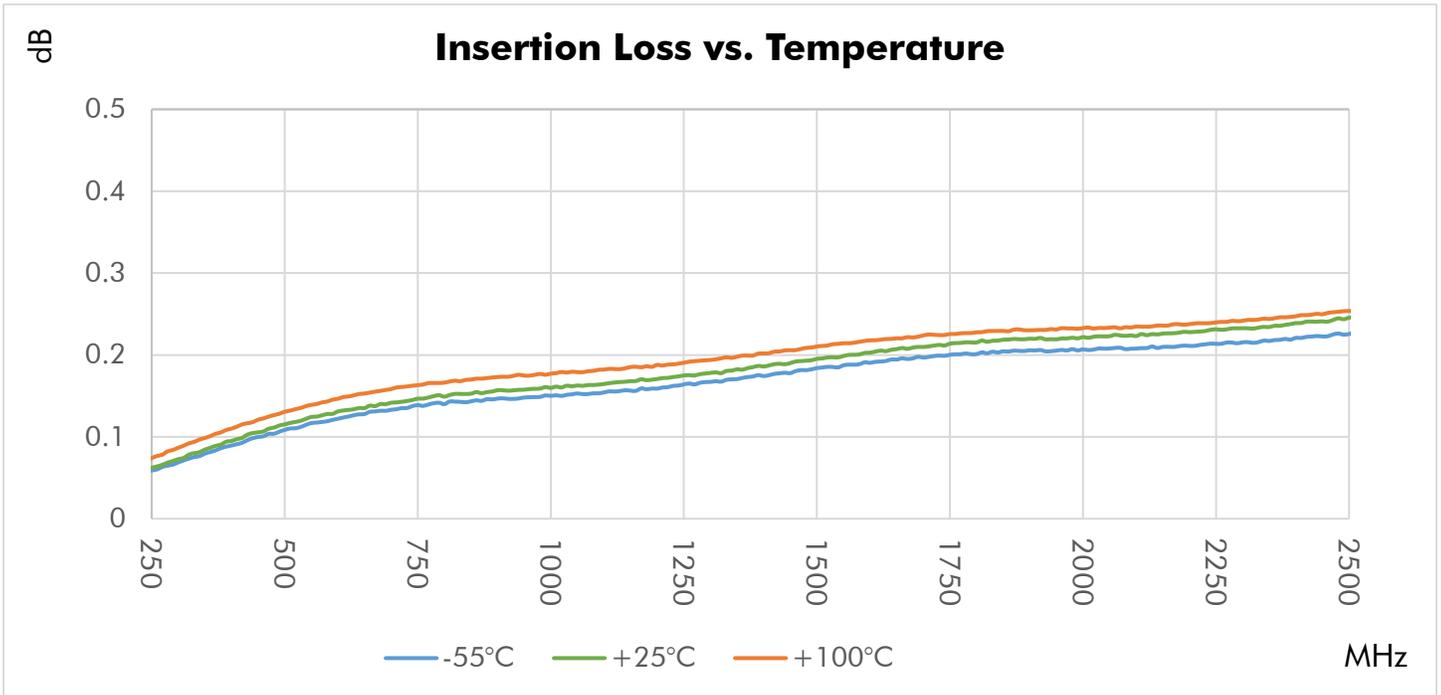
## Typical Performance at +25 °C





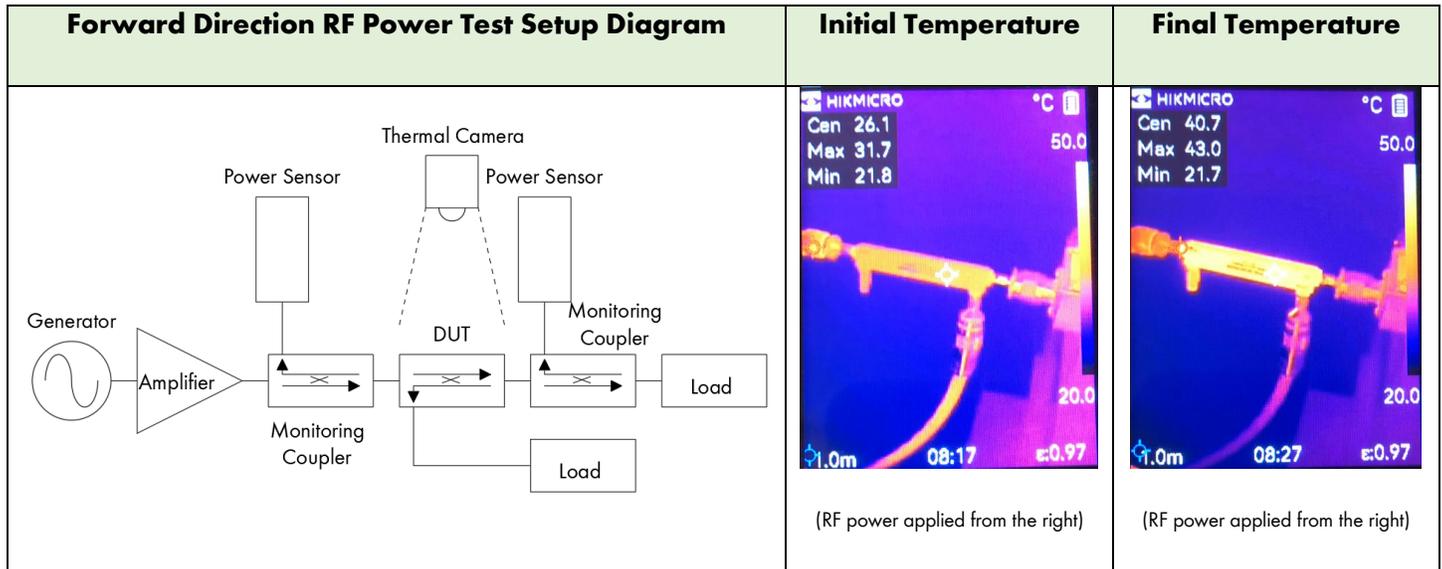
## Typical Performance Over Temperature



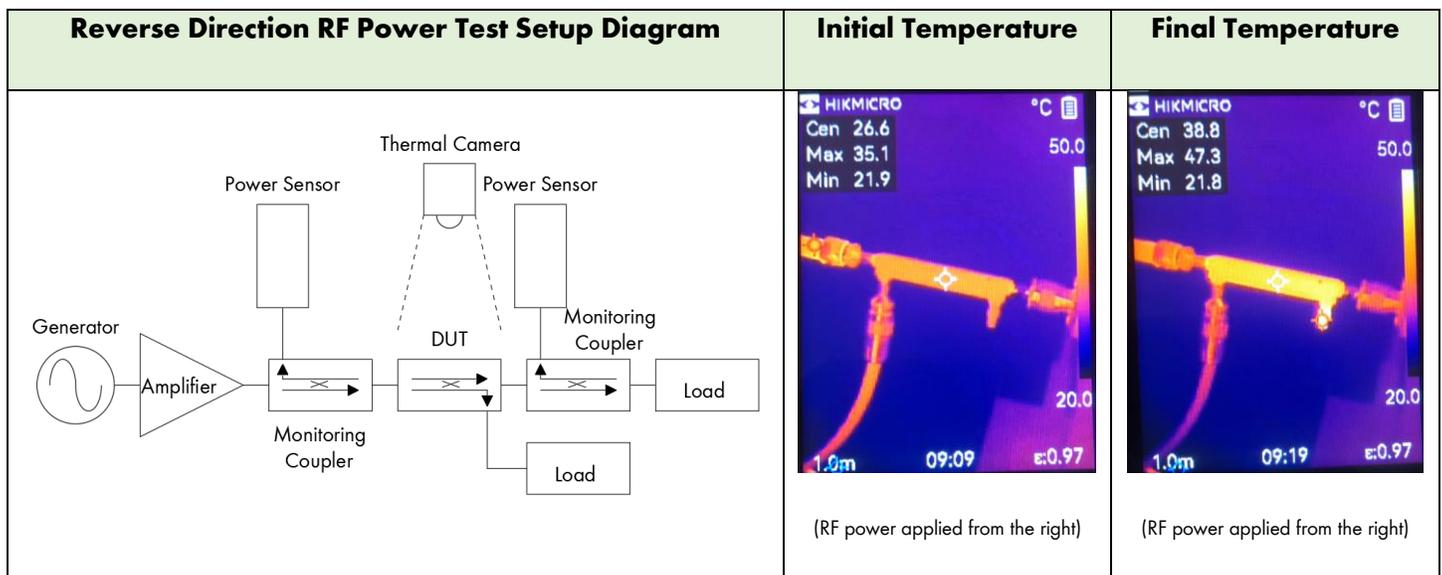


## Reliability Testing

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.

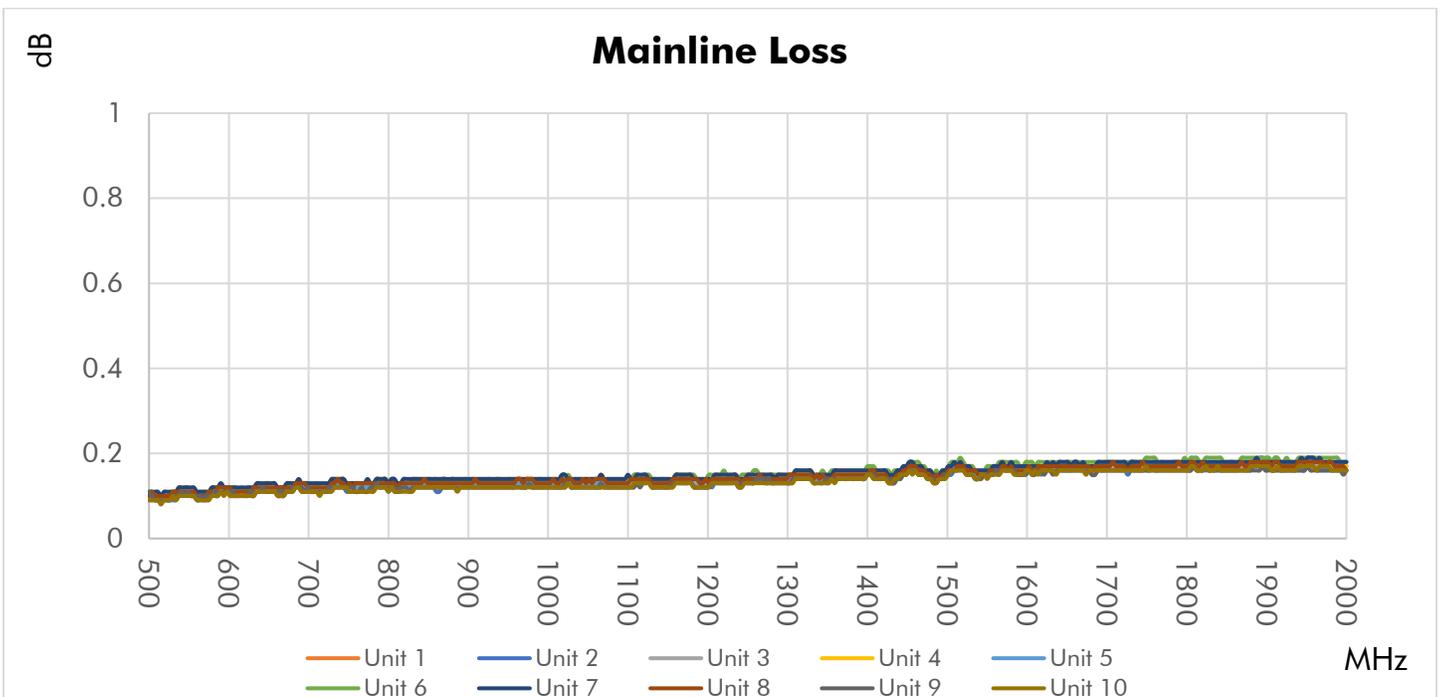
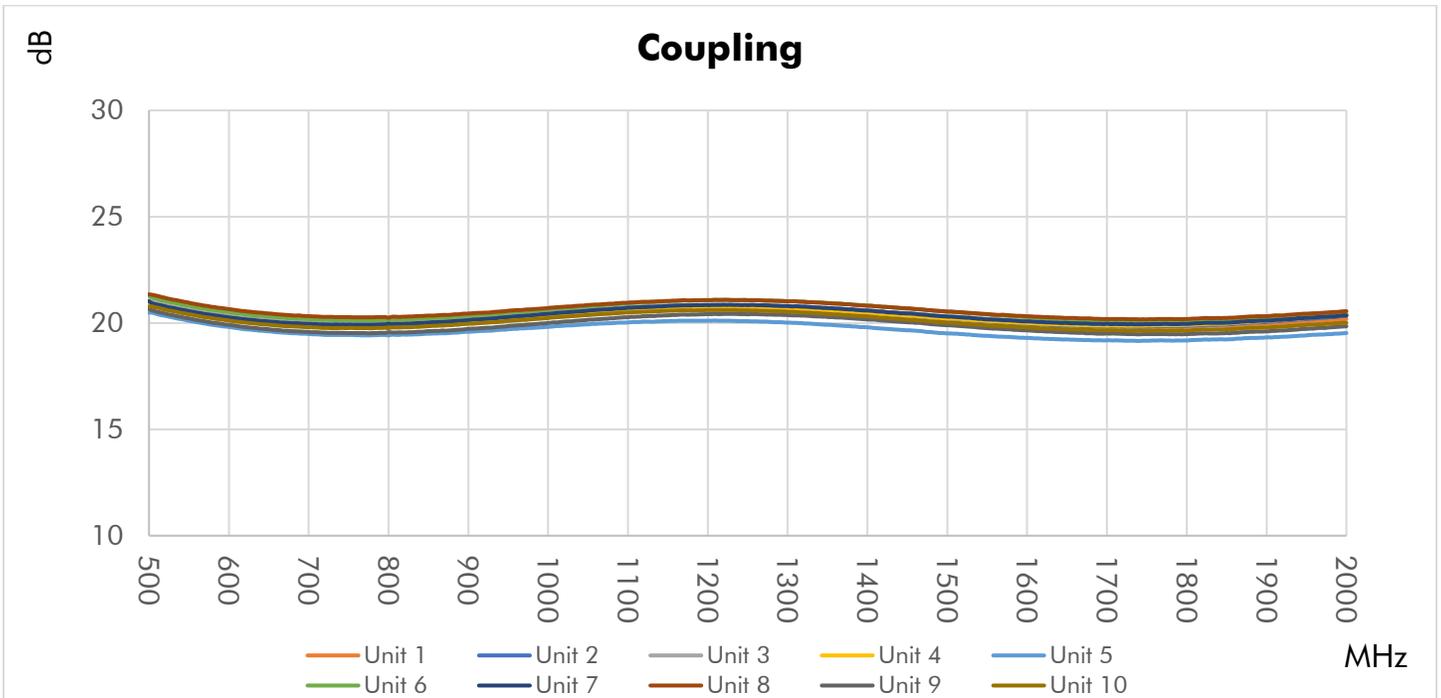


- 100 watts CW at 500MHz was applied to the DUT input for a duration of 10 minutes.
- The DUT temperature increased from 26.1°C (initial, center marker) to 43.0°C (final, max marker), resulting in a 16.9°C rise.



- 75 watts CW at 500MHz was applied to the DUT output for a duration of 10 minutes.
- The DUT temperature increased from 26.6°C (initial, center marker) to 47.3°C (final, max marker), resulting in a 20.7°C rise.
- The DUT termination was receiving an estimated power of 0.75W, based on a 20dB coupling factor.

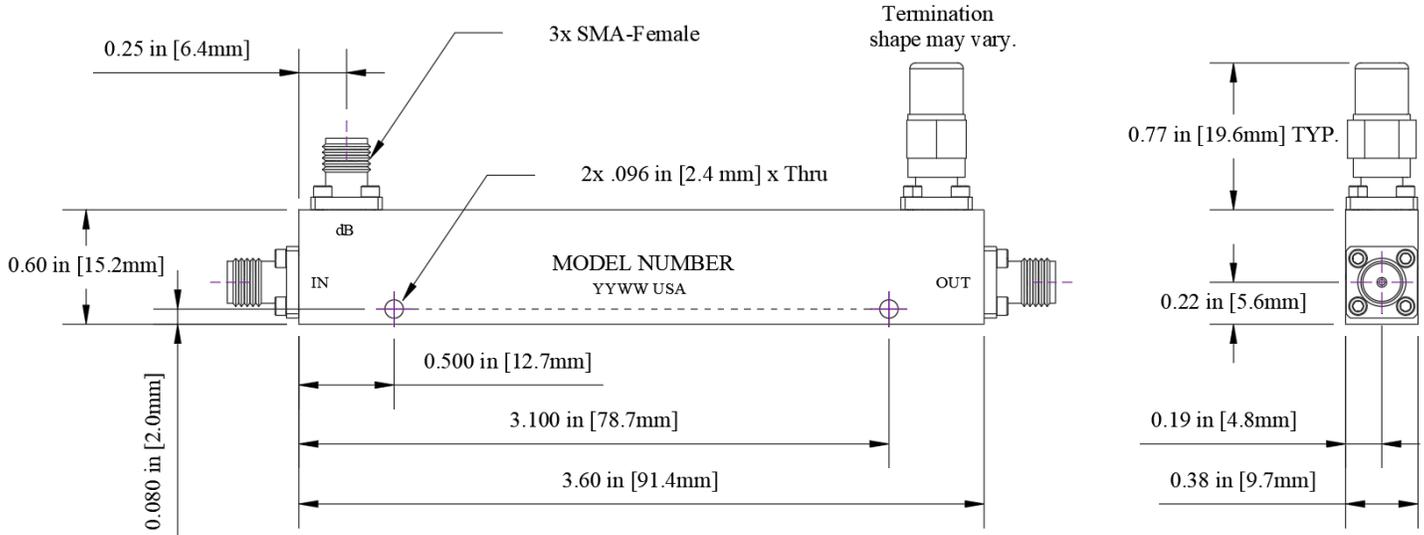
## Repeatability in Production



## Typical Performance Data

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
400	29.3	29.2	31.0	0.1	21.6	35.4
500	28.7	29.2	31.5	0.1	20.5	36.2
600	28.3	28.6	31.3	0.1	19.7	37.3
700	28.9	28.4	32.0	0.2	19.4	38.6
800	29.4	29.3	35.8	0.2	19.3	40.8
900	30.9	31.0	41.3	0.2	19.5	43.5
1000	34.1	34.6	39.4	0.2	19.7	41.9
1100	41.0	41.0	33.0	0.2	20.1	36.8
1200	47.1	47.6	29.1	0.2	20.2	32.7
1300	34.7	33.3	26.6	0.2	20.1	29.9
1400	30.0	29.0	24.8	0.2	19.9	28.0
1500	27.1	26.9	24.0	0.2	19.7	26.9
1600	25.9	25.4	24.1	0.2	19.4	26.3
1700	24.9	24.6	25.0	0.2	19.2	26.2
1800	24.8	24.9	26.8	0.2	19.2	26.6
1900	25.4	25.3	30.2	0.3	19.4	27.6
2000	27.0	27.4	37.6	0.2	19.5	29.6
2100	29.8	30.4	38.7	0.3	19.8	33.6
2200	36.9	38.1	30.8	0.2	20.0	45.2

## Outline Dimensions



Outline # OL-1002

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

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

The information contained in this document is accurate to the best of our knowledge and representative of the product described herein at the date of publication. It may be necessary to make modifications to the product and/or documentation of the product. Werbel Microwave LLC reserves the right to make such changes as required without notice. Unless otherwise stated, all specifications and dimensions are nominal. Werbel Microwave LLC does not make any representation or warranty regarding the suitability of the product described herein for any particular purpose or application, and Werbel Microwave LLC does not assume any liability arising out of the use of any part of documentation. This document gives only a description of the product(s) and shall not form part of any contract. Please contact a Werbel Microwave LLC Applications Engineer for the most current specification drawing.

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.