WERBEL MICROWAVE LLC
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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 ± 1.2	--	dB
Frequency Sensitivity (Flatness)		--	± 0.6	±1.2	dB
Mainline Loss[1]		--	1.3	1.7	dB
Directivity	300-6000MHz 6000-8000MHz	19 17	25 22	--	dB
Main Line Return Loss	300-6000MHz 6000-8000MHz	20 17	25 23	--	dB
Secondary Line Return Loss	300-6000MHz 6000-8000MHz	20 17	24 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

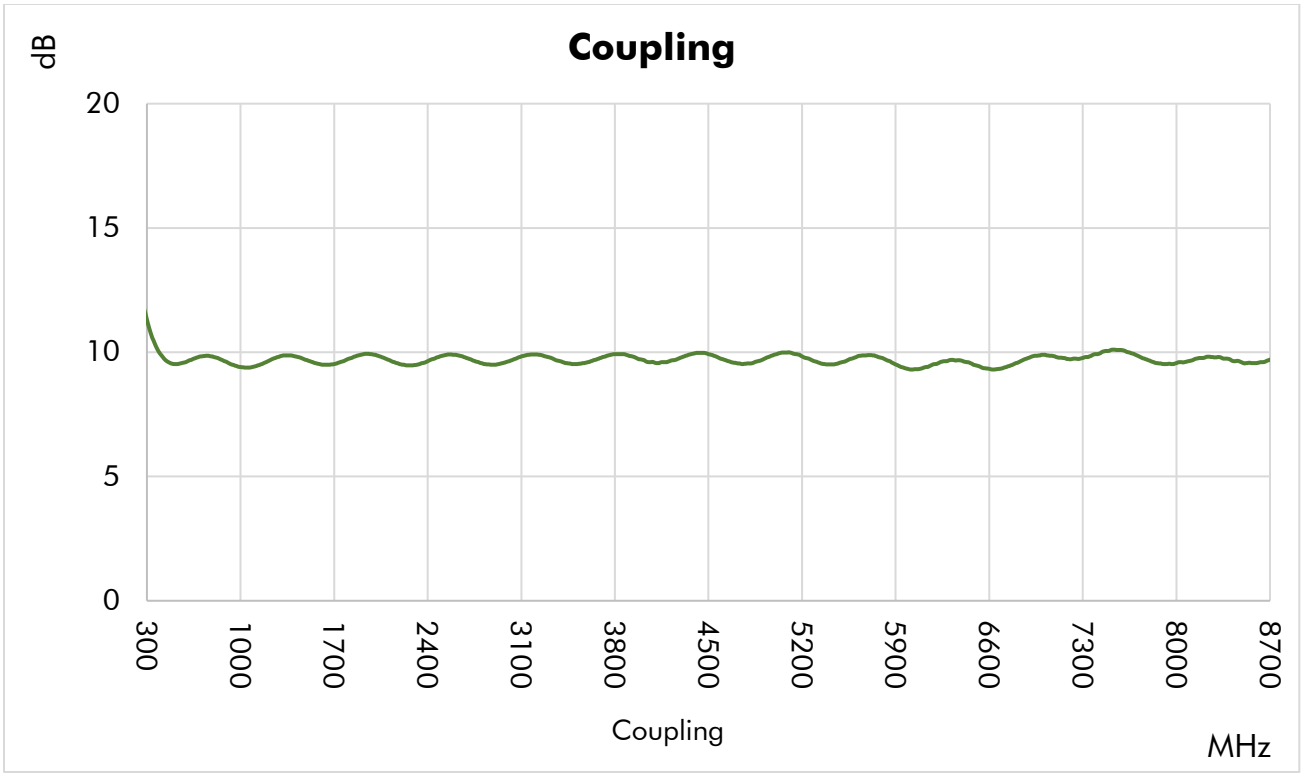
Materials

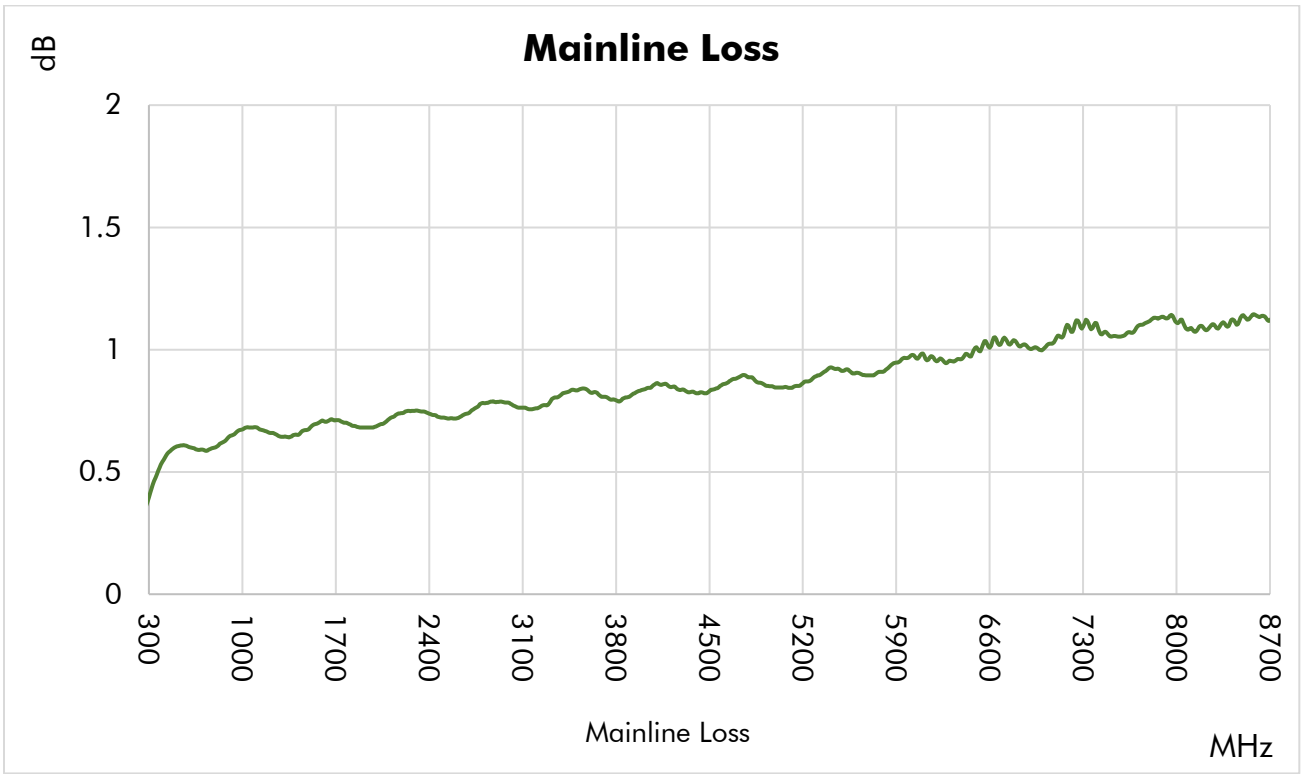
RoHS and REACH Compliant[4]

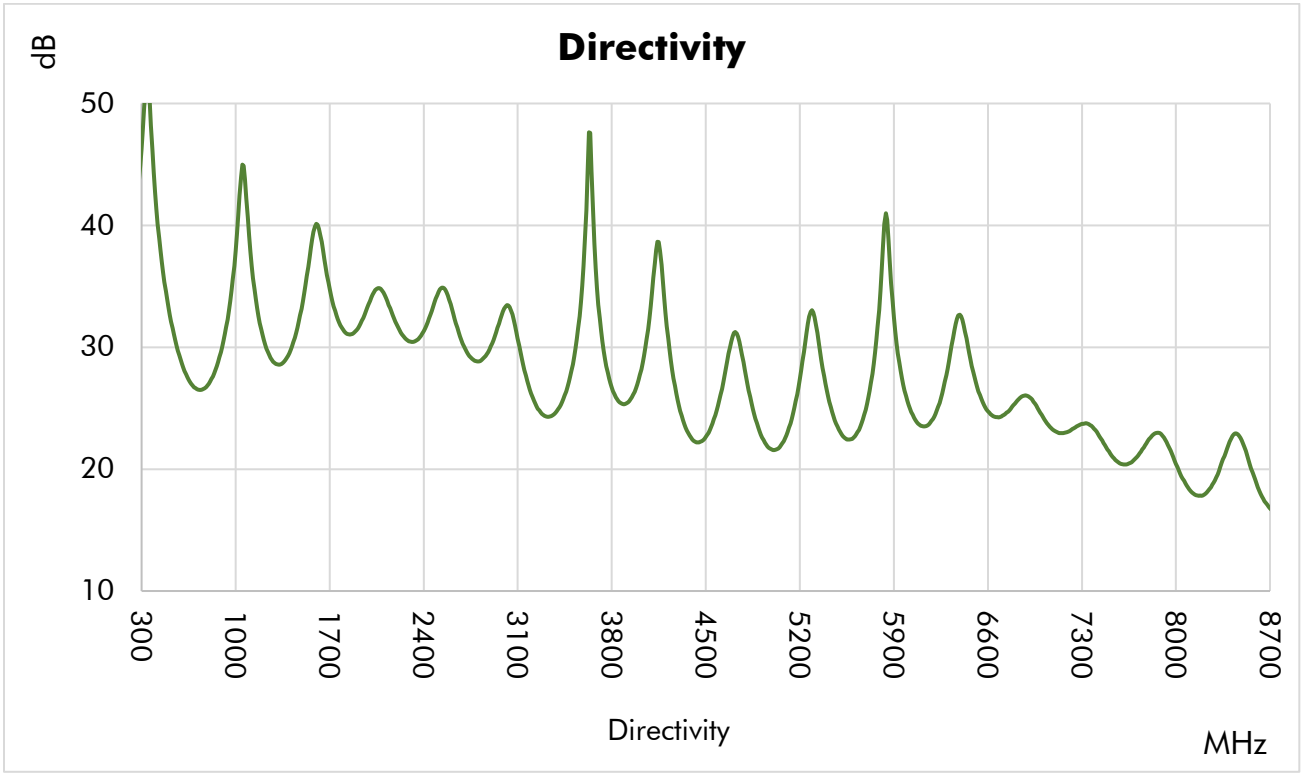
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

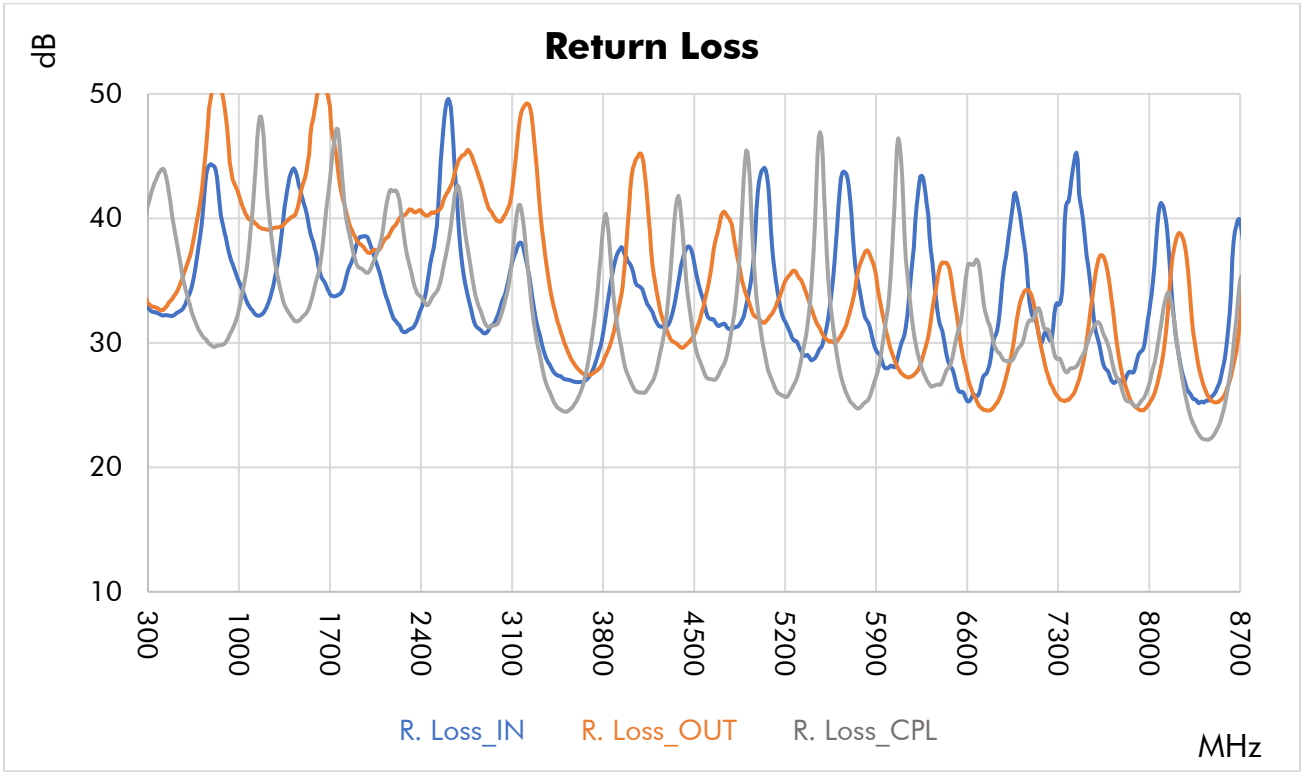
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication.

Typical Performance at +25 °C

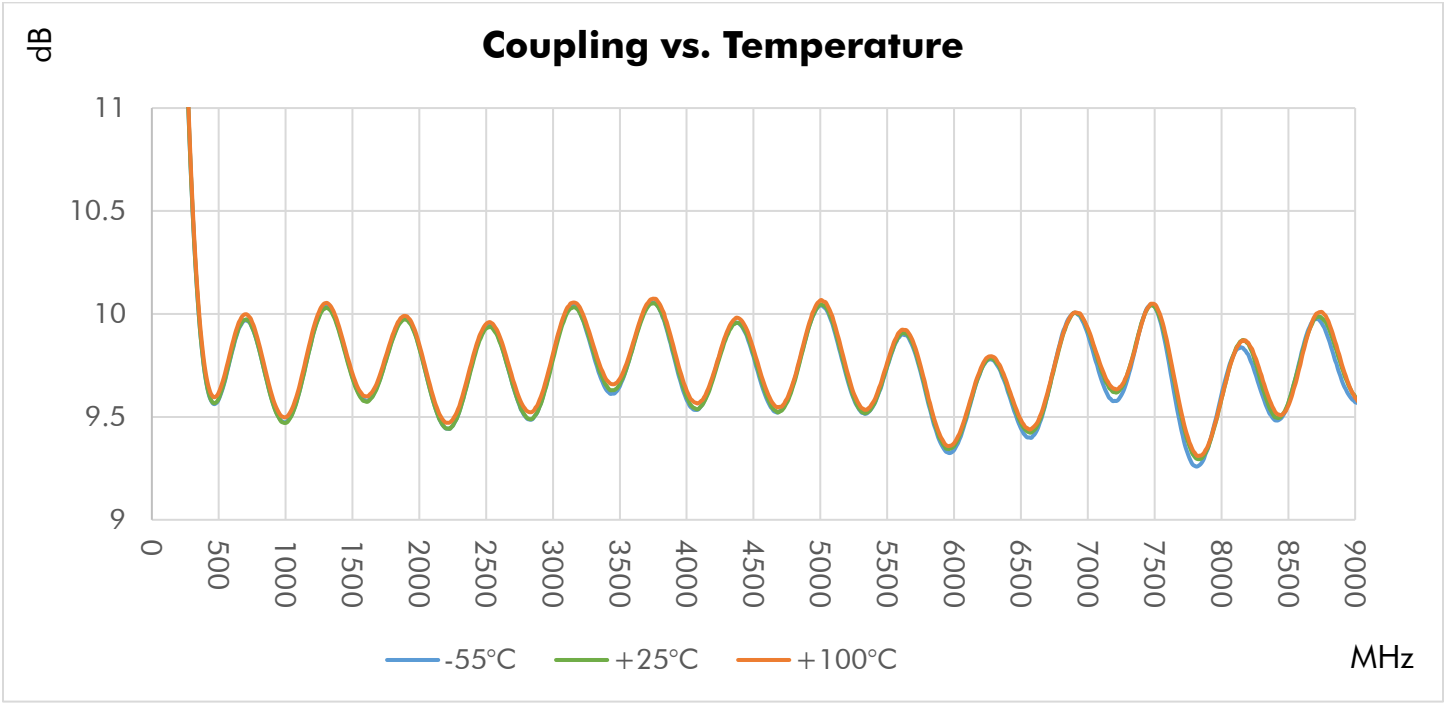


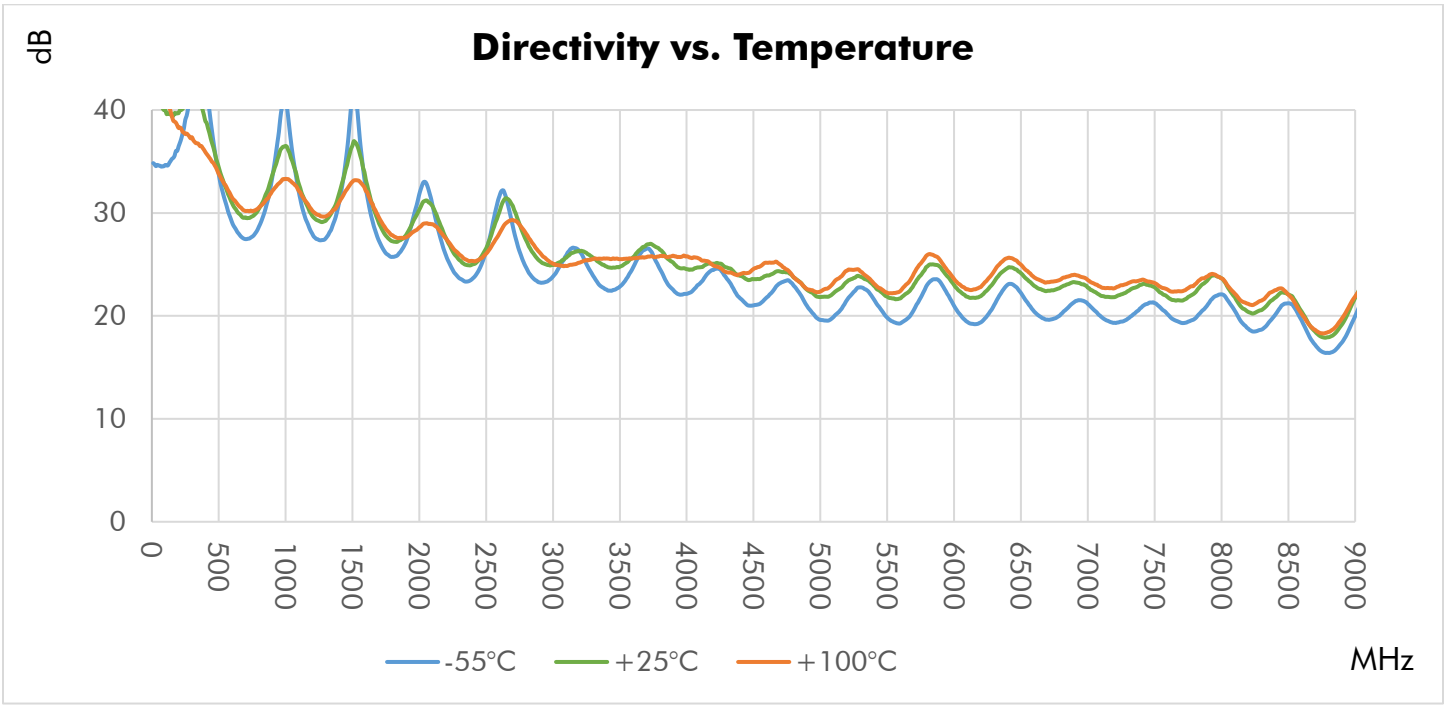


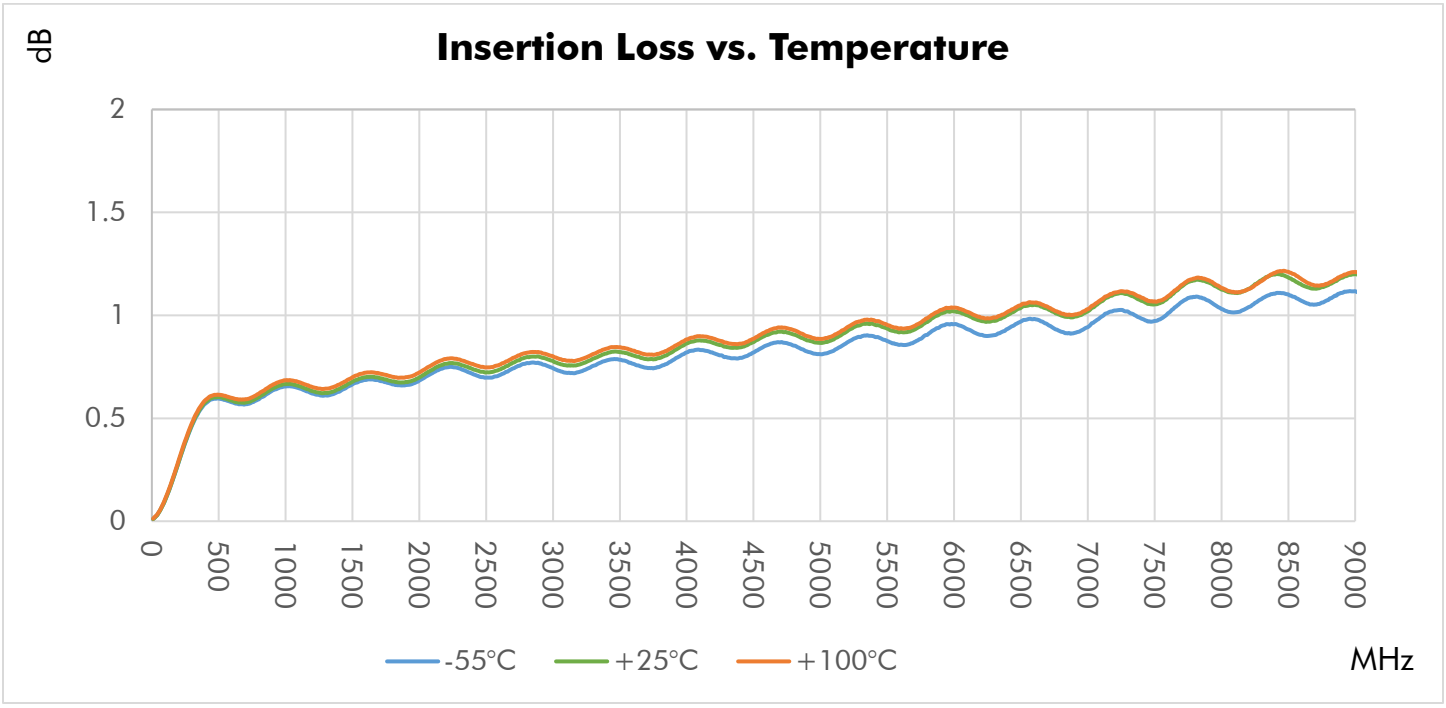

Directivity
dB
50
40
30
20
10
300
1000
1700
2400
3100
3800
4500
5200
5900
6600
7300
8000
8700
Directivity
MHz

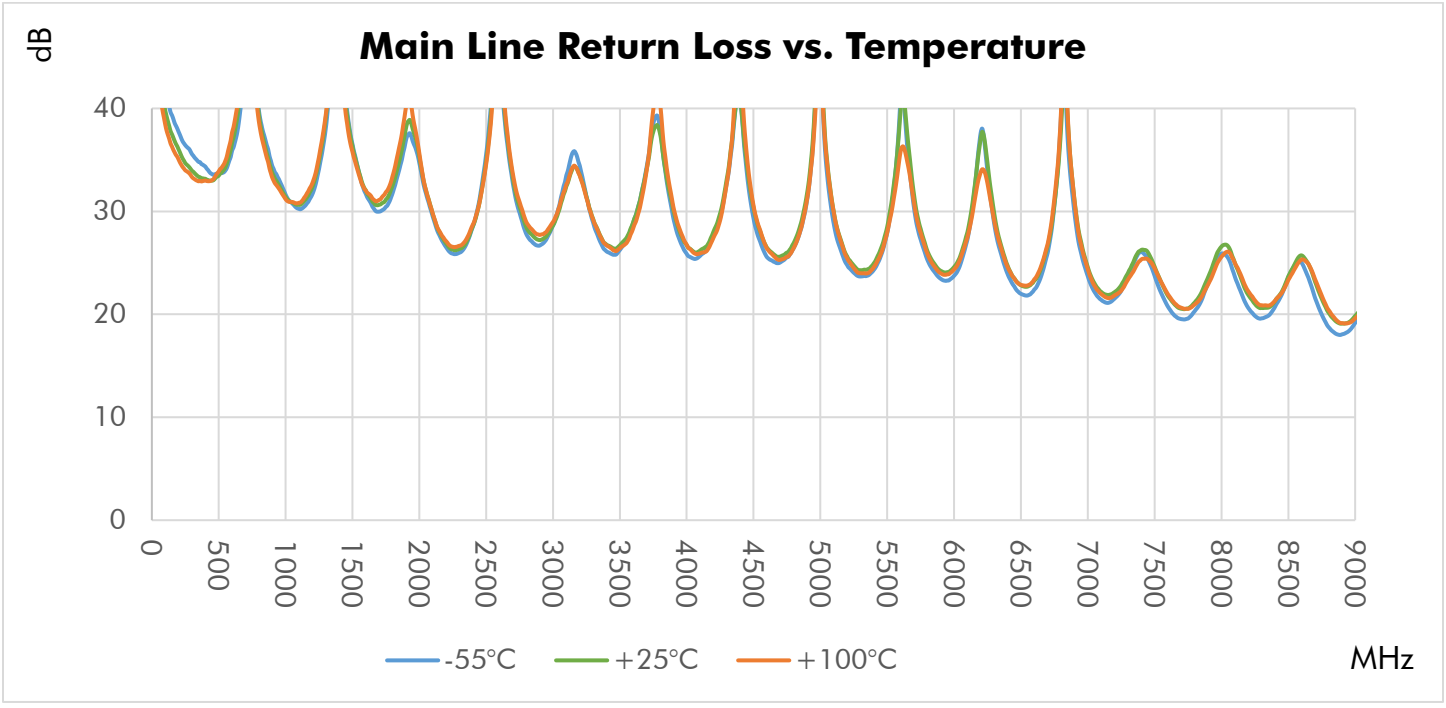

Return Loss
dB
50
40
30
20
10
300
1000
1700
2400
3100
3800
4500
5200
5900
6600
7300
8000
8700
R. Loss_IN
R. Loss_OUT
R. Loss_CPL
MHz

Typical Performance over Temperature



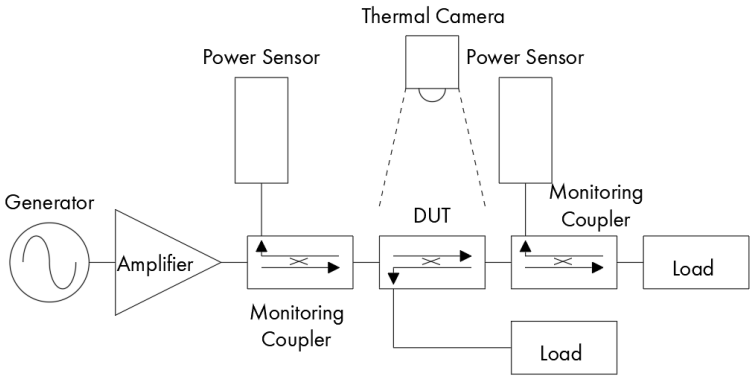



Insertion Loss vs. Temperature
dB
2
1.5
1
0.5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
-55°C
+25°C
+100°C
MHz

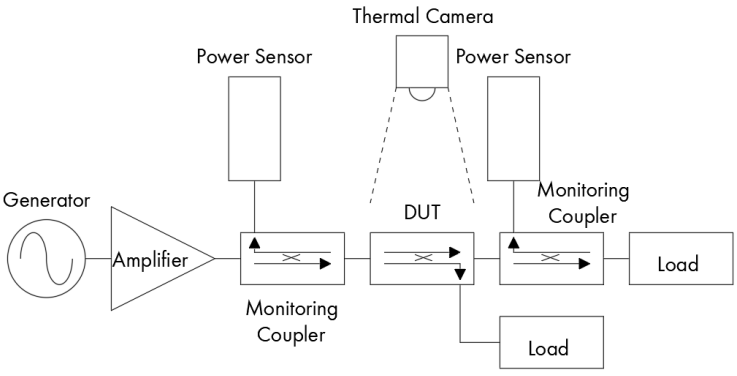

Main Line Return Loss vs. Temperature
dB
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
-55°C
+25°C
+100°C
MHz

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.

Forward Direction RF Power Test Setup Diagram	Initial Temperature	Final Temperature
	 (RF power applied from the right)	 (RF power applied from the right)

- 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.

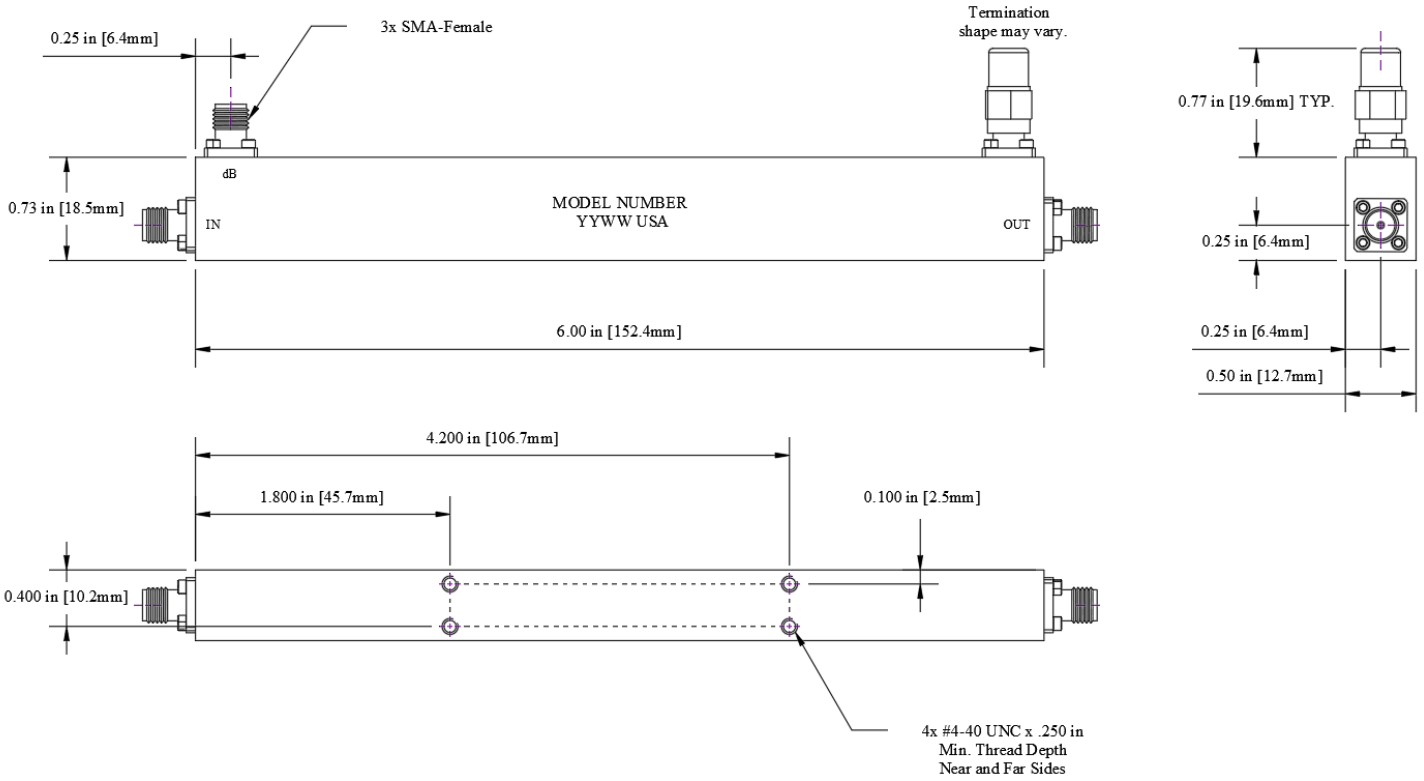
Reverse Direction RF Power Test Setup Diagram	Initial Temperature	Final Temperature
	 (RF power applied from the right)	 (RF power applied from the right)

- 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

Outline Dimensions



Outline # OL-1830
Dimensions are in inches, [mm] shown for convenience.
Tolerances on 2-pl decimals: ±.03. 3-pl decimals: ± .015.