WERBEL MICROWAVE LLC
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Directional Coupler, 0.3-8GHz, 30dB, SMA Female

WMC-0.3-8-30dB-S

Description

Model WMC-0.3-8-30dB-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. The very wideband response covers the upper portion of UHF, L, S and C bands making it very useful in test and measurement applications. The enclosure measures 6.00 x 0.73 x 0.50 inches with threaded mounting holes on both sides for support. Typical coupling flatness ±0.6dB. Directivity 23dB typical. Return loss 25dB typical. Insertion loss 0.5dB typical. Rugged stainless-steel connectors and aluminum enclosure. Designed, tested, and assembled in the USA.

Photo is representative.

Specifications		Min.	Typ.	Max.	Units
Frequency		300	--	8000	MHz
Impedance		--	50	--	Ohm
Coupling		--	30 ± 2.0	--	dB
Frequency Sensitivity (Flatness)		--	± 0.6	±1.2	dB
Mainline Loss[1]		--	0.5	1.0	dB
Directivity	300-6000MHz 6000-8000MHz	16 14	23 19	--	dB
Return Loss (In and Out)	300-6000MHz 6000-8000MHz	16 15	27 25	--	dB
Return Loss (Coupling)	300-6000MHz 6000-8000MHz	16 15	23 21	--	dB
Isolation		--	55	--	dB
Input Power (CW)[2]		--	--	50	Watts

Mechanical

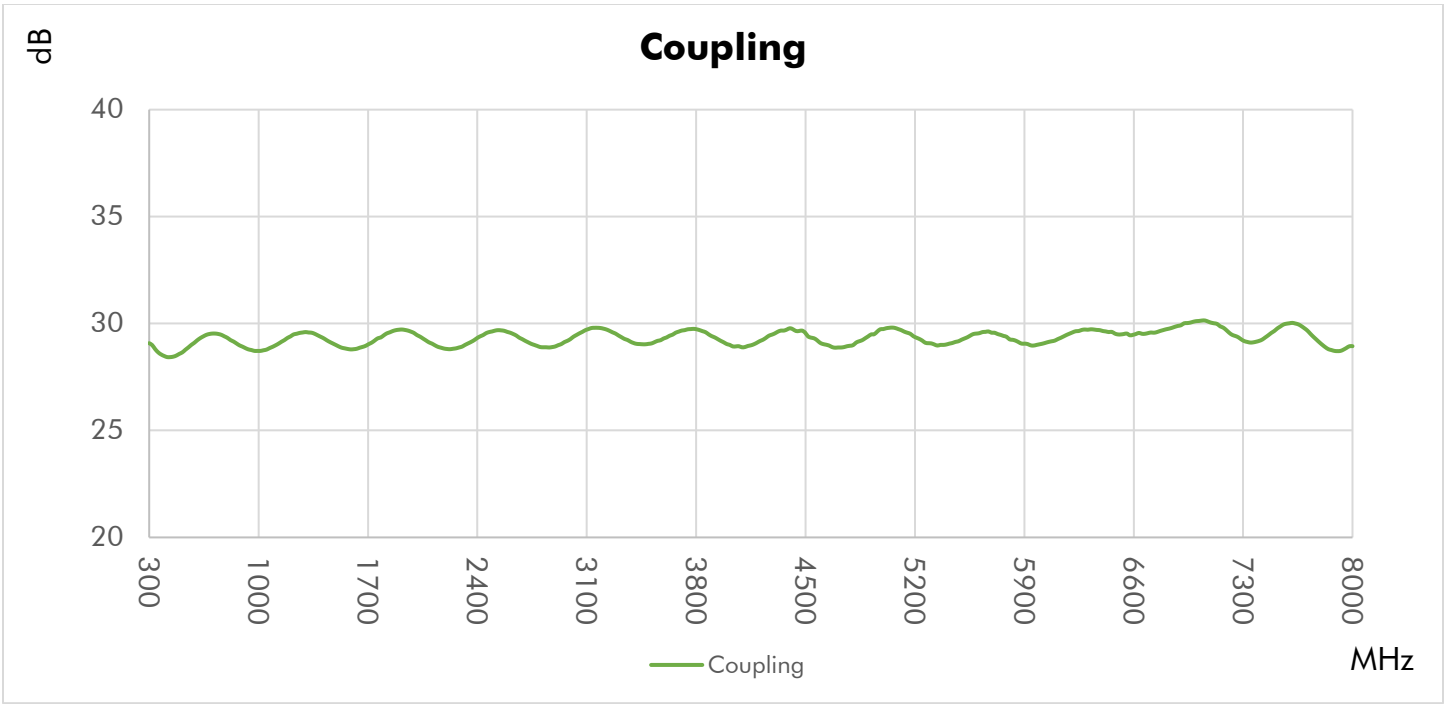
Connector Interface	SMA-Female
Operating Temperature[3]	-55 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	3.5 oz (86 g)
Humidity	10-90% non-condensing
Environment	Indoors Use Only
CAGE Code	78YZ0

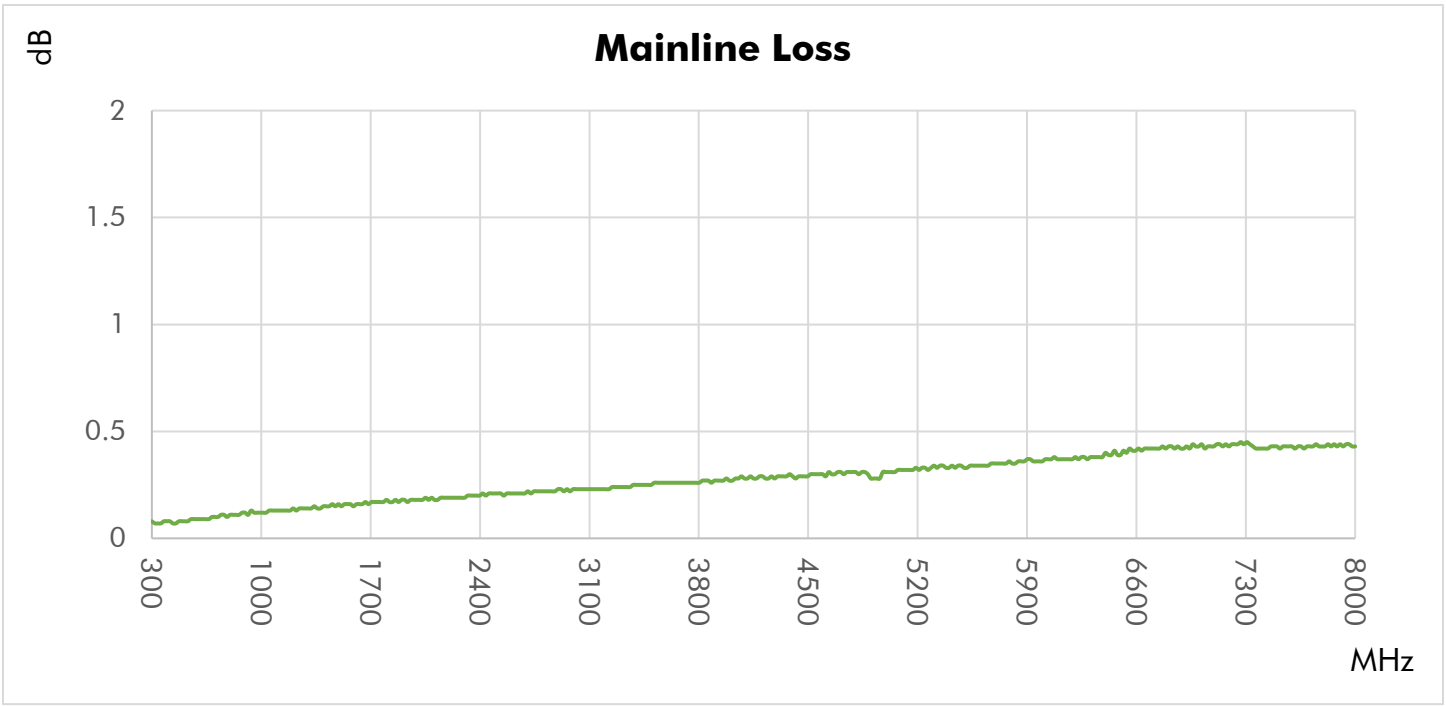
Materials

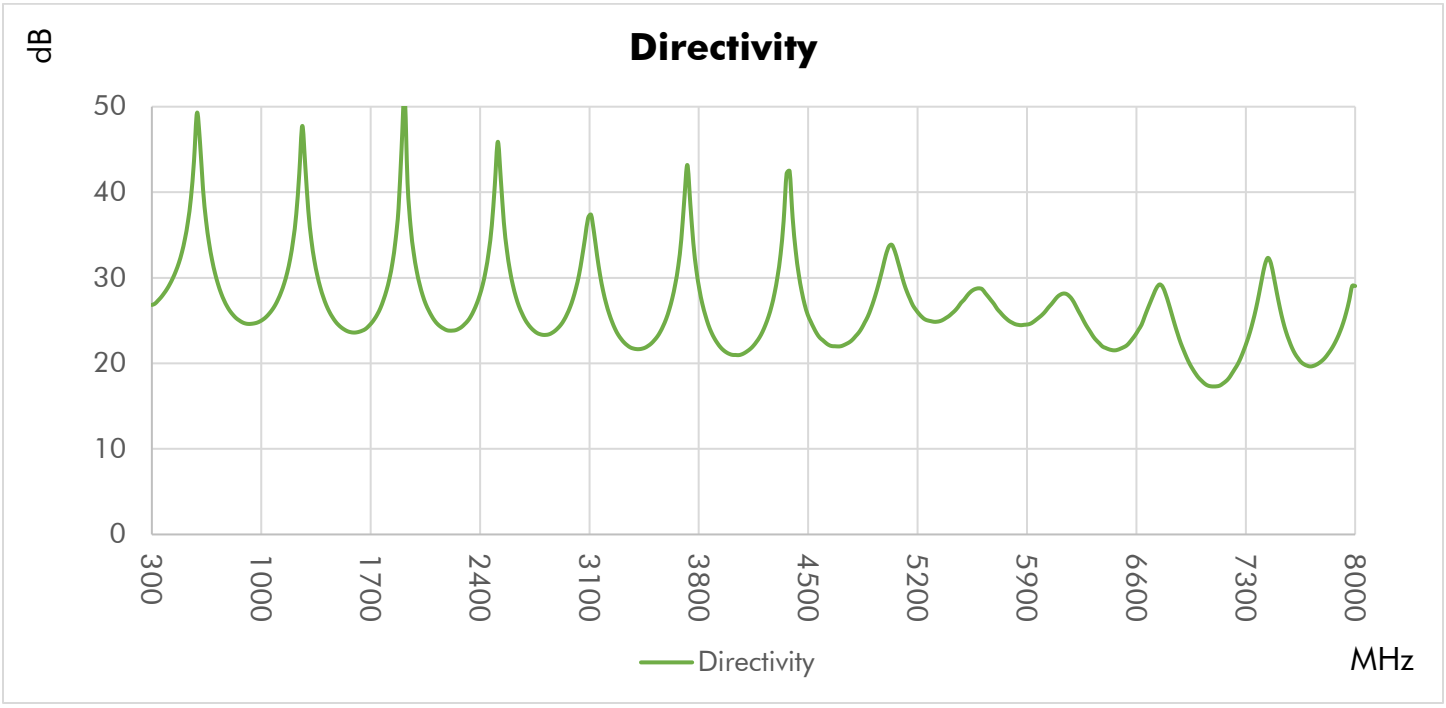
RoHS Compliant[4]	Yes
REACH Compliant[4]	Yes
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

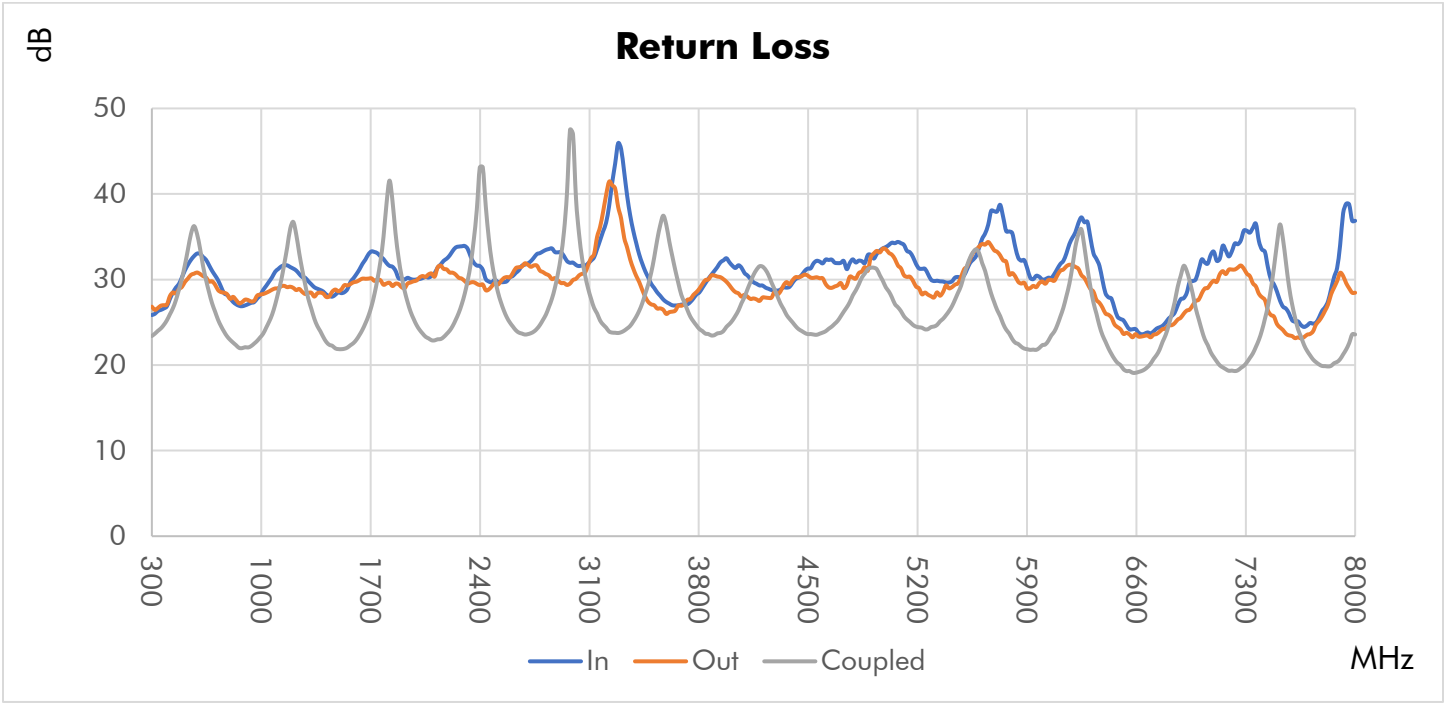
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at time of publication.

Typical Performance at +25 °C

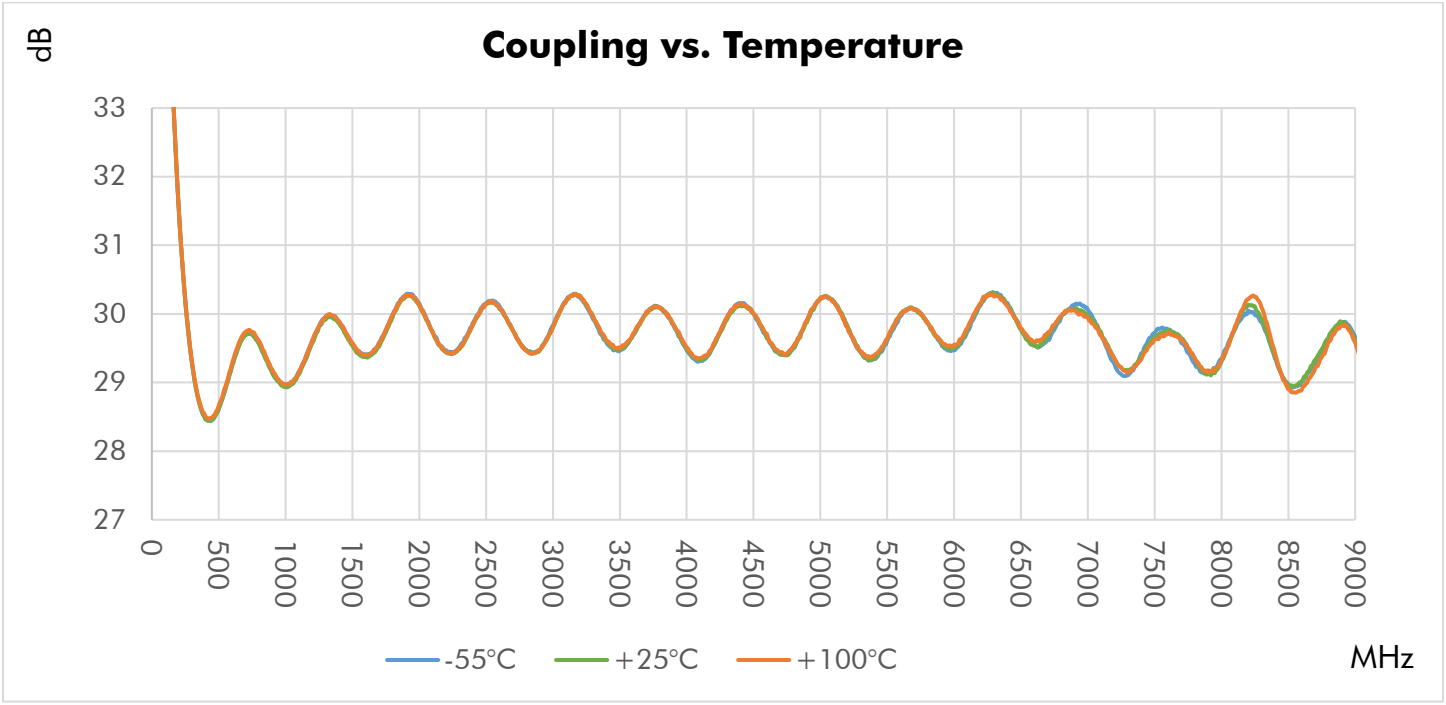


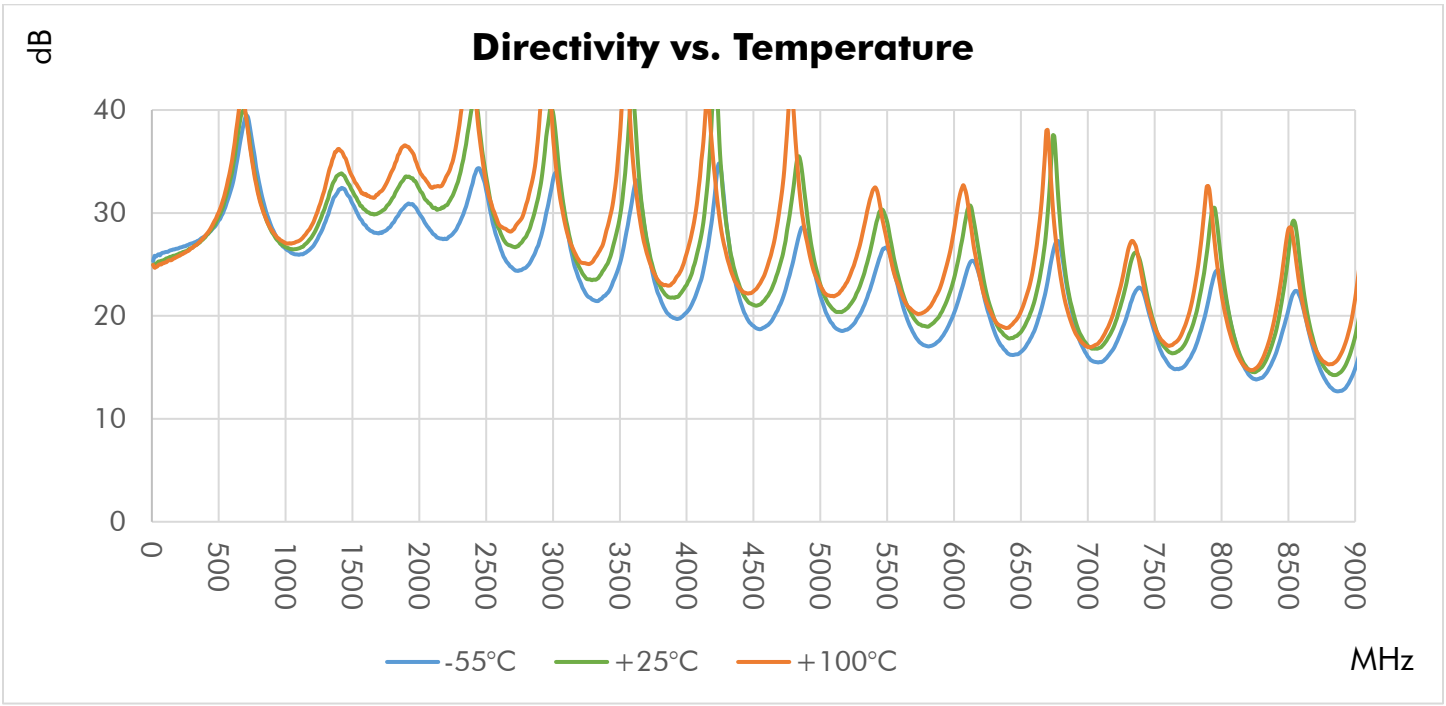


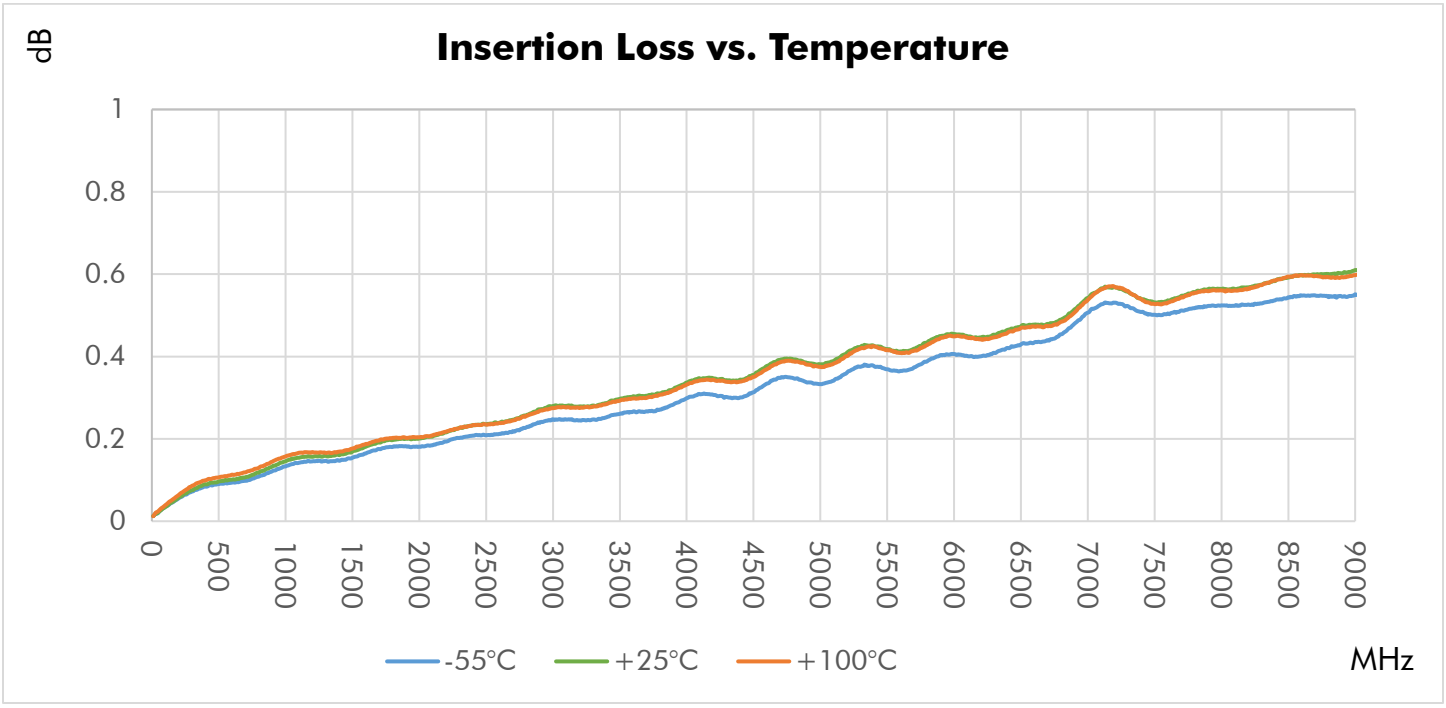

Directivity
dB
50
40
30
20
10
0
300
1000
1700
2400
3100
3800
4500
5200
5900
6600
7300
8000
Directivity
MHz

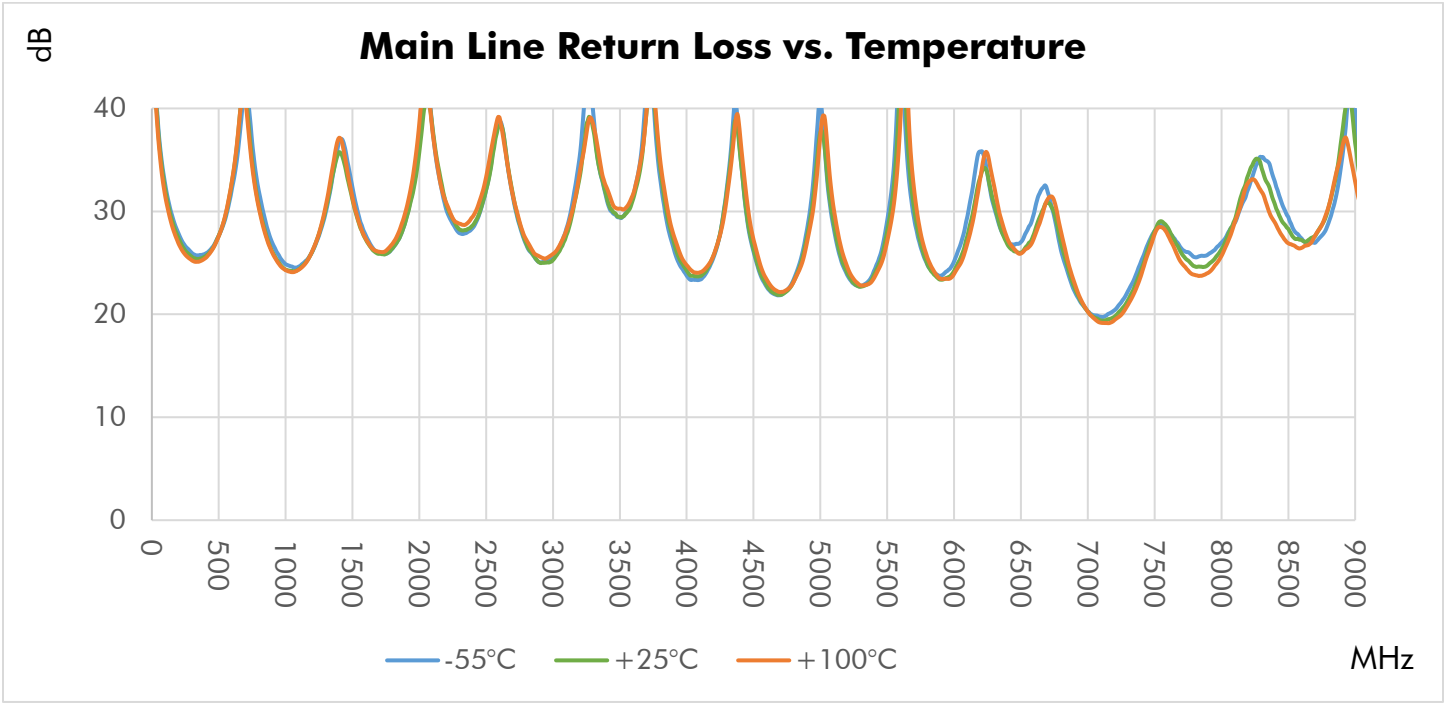

Return Loss
dB
50
40
30
20
10
0
300
1000
1700
2400
3100
3800
4500
5200
5900
6600
7300
8000
In
Out
Coupled
MHz

Typical Performance over Temperature



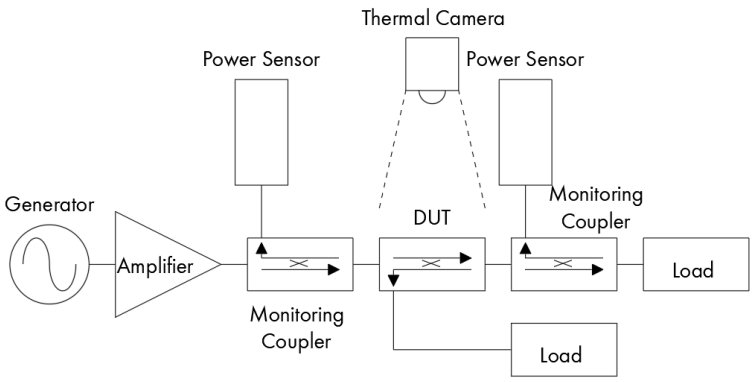



Insertion Loss vs. Temperature
dB
1
0.8
0.6
0.4
0.2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
-55°C
+25°C
+100°C
MHz

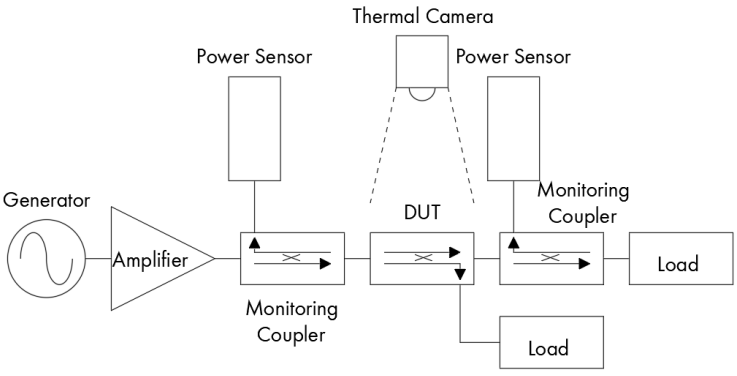

Main Line Return Loss vs. Temperature
dB
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
-55°C
+25°C
+100°C
MHz

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.

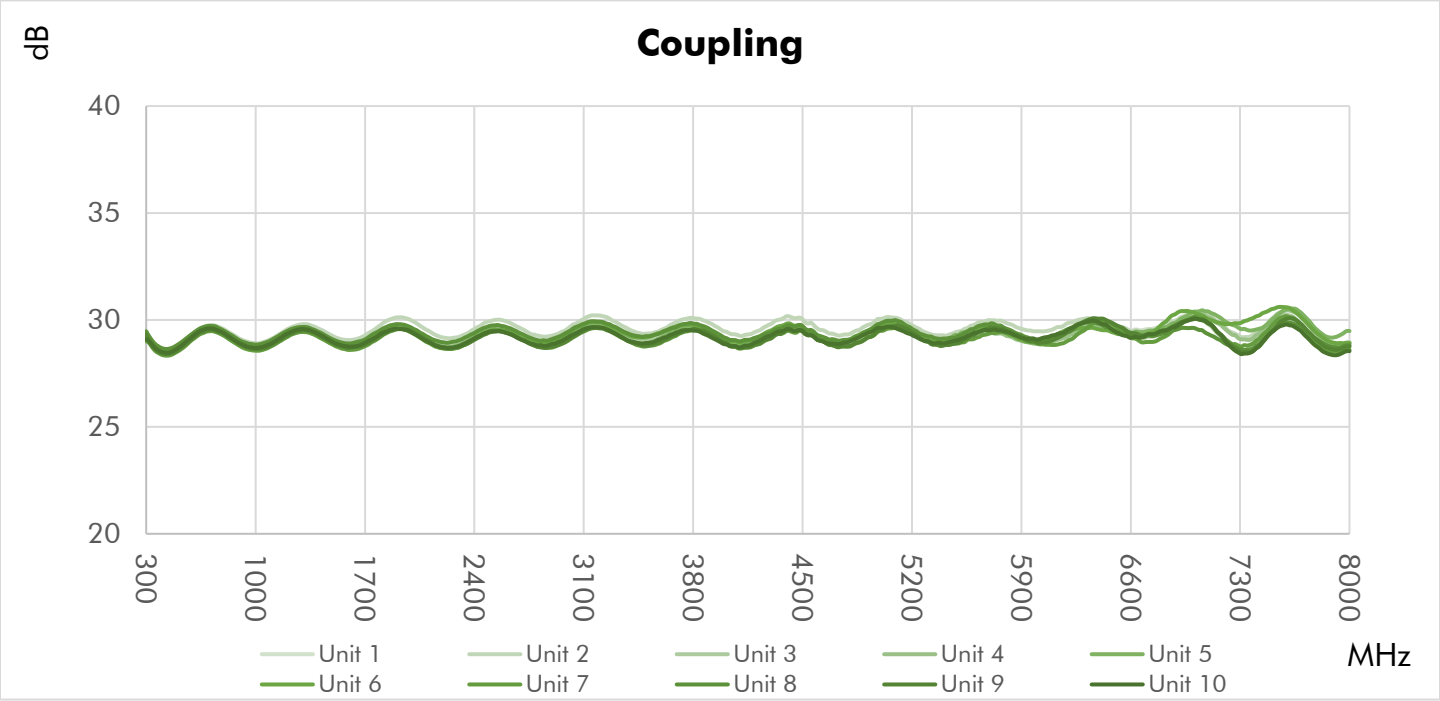
Forward Direction RF Power Test Setup Diagram	Initial Temperature	Final Temperature
	 (RF power applied from the right)	 (RF power applied from the right)

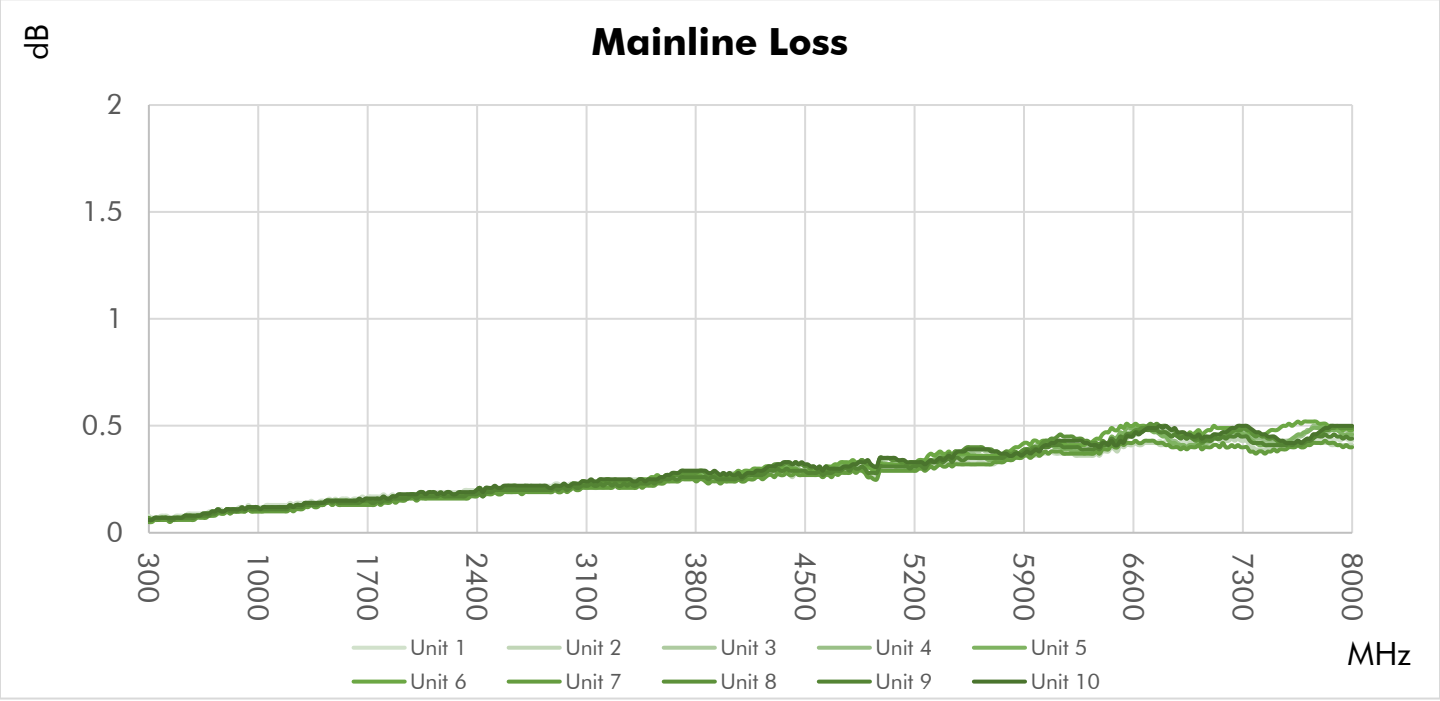
- 200 watts CW at 500MHz was applied to the DUT input for a duration of 10 minutes.
- The DUT temperature increased from 21.4°C (initial, center marker) to 43.0°C (final, max marker), resulting in a 21.6°C rise.

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

- 200 watts CW at 500MHz was applied to the DUT output for a duration of 10 minutes.
- The DUT temperature increased from 24.5°C (initial, center marker) to 44.7°C (final, max marker), resulting in a 20.2°C rise.
- The DUT termination was receiving an estimated power of 0.2W, based on a 30dB coupling factor.

Repeatability in Production

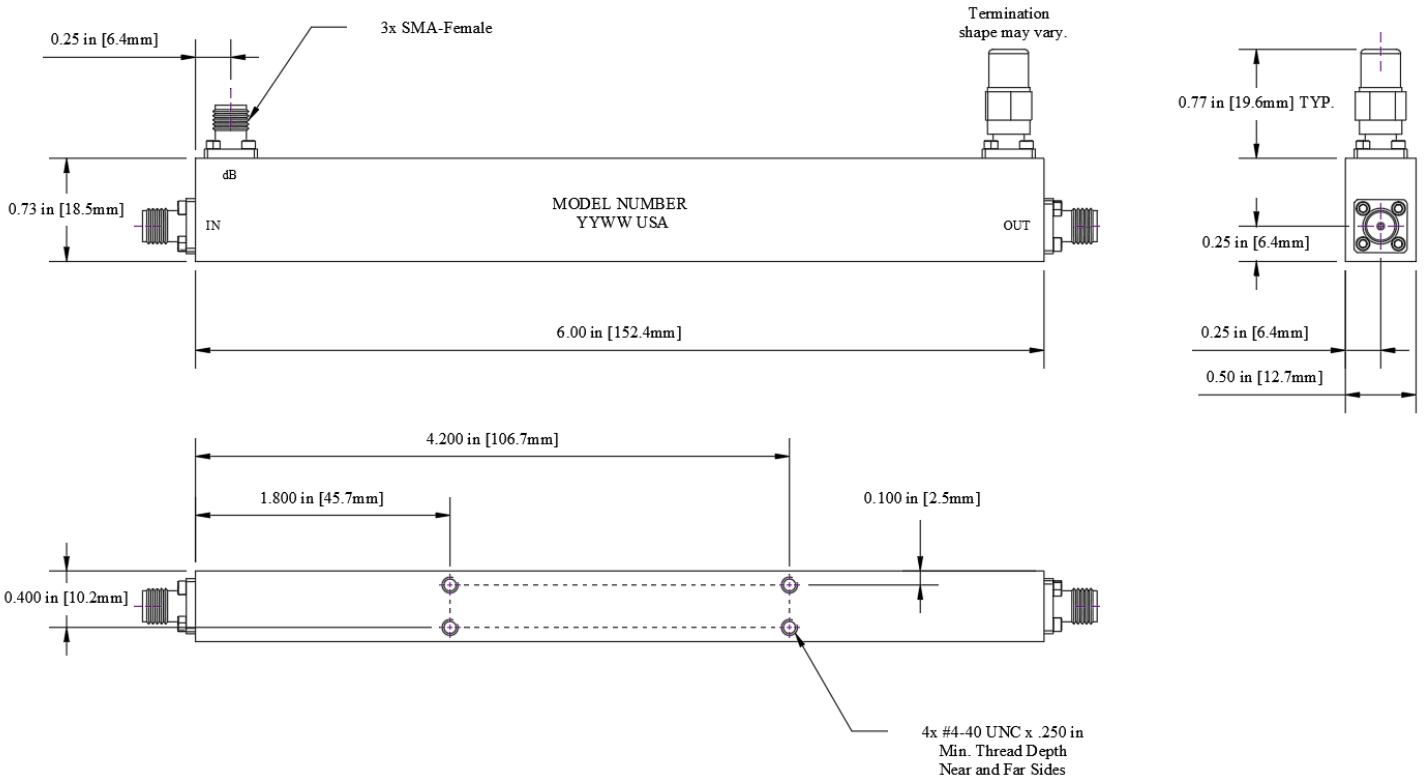




Typical Performance Data

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
300	26.7	26.8	25.2	0.1	29.2	28.1
608	34.5	31.5	34.2	0.1	29.1	38.6
916	26.8	27.3	24.9	0.1	28.7	27.0
1224	34.9	31.4	39.1	0.1	29.3	28.9
1532	28.2	28.8	26.0	0.2	28.8	27.9
1840	37.9	33.9	37.9	0.2	29.5	26.3
2148	30.2	30.6	29.0	0.2	28.8	25.9
2456	38.8	39.0	32.6	0.2	29.4	25.8
2764	29.8	30.0	30.5	0.2	28.9	24.7
3072	38.8	36.0	29.9	0.2	29.5	24.7
3380	35.3	48.1	42.7	0.2	29.0	21.7
3688	27.8	28.2	27.0	0.2	29.5	24.7
3996	29.7	30.5	32.8	0.3	28.9	19.7
4304	32.5	33.3	25.3	0.3	29.4	25.0
4612	27.9	31.7	27.4	0.3	28.9	18.3
4920	34.2	34.9	25.5	0.3	29.4	24.6
5228	27.9	30.8	23.3	0.3	29.0	17.7
5536	40.6	41.9	25.4	0.3	29.3	26.6
5844	23.8	24.9	21.1	0.4	29.0	18.2
6152	42.9	35.0	26.1	0.4	29.3	29.2
6460	20.1	21.8	18.5	0.4	29.3	19.3
6768	25.5	25.5	23.2	0.4	29.5	30.4
7076	22.6	25.9	18.1	0.4	29.5	24.1
7384	27.3	27.3	24.3	0.5	29.3	19.7
7692	21.3	22.9	16.8	0.4	29.8	19.9
8000	25.3	25.6	27.4	0.4	28.6	17.6

Outline Dimensions



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