WERBEL MICROWAVE LLC
628 State Route 10, Unit 14
Tel. (973) 515-3001
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Directional Coupler, 0.5-20GHz, 10dB, SMA Female

WMC-0.5-20-10dB-S

Description

Model WMC-0.5-20-10dB-S from Werbel Microwave is a directional coupler that covers 500 MHz to 20 GHz with broadband flat coupling response, high directivity, and excellent return loss performance. The ultra-wideband design covers the upper UHF, L, S, C, X, Ku and lower K band in one package measuring 4.40 x 0.73 x 0.50 inches with threaded mounting holes on both sides. Durable, stainless-steel SMA connectors. The aluminum enclosure is rugged. Assembled and tested in USA. Made with RoHS compliant materials.

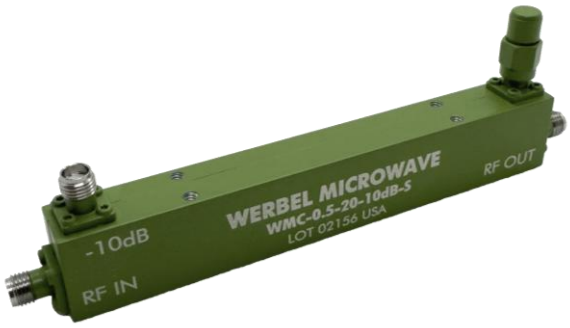


Photo is representative.

Specifications	Min.	Typ.	Max.	Units
Frequency	500	--	20000	MHz
Impedance	--	50	--	Ohm
Coupling	--	10 ± 1.2	--	dB
Frequency Sensitivity (Flatness)	--	±0.54	±1.8	dB
Mainline Loss[1]	--	1.7	2.1	dB
Directivity	12	15	--	dB
Return Loss (In and Out)	12	16	--	dB
Return Loss (Coupling)	11	14	--	dB
Isolation	--	25	--	dB
Input Power (CW)[2]	--	--	20	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

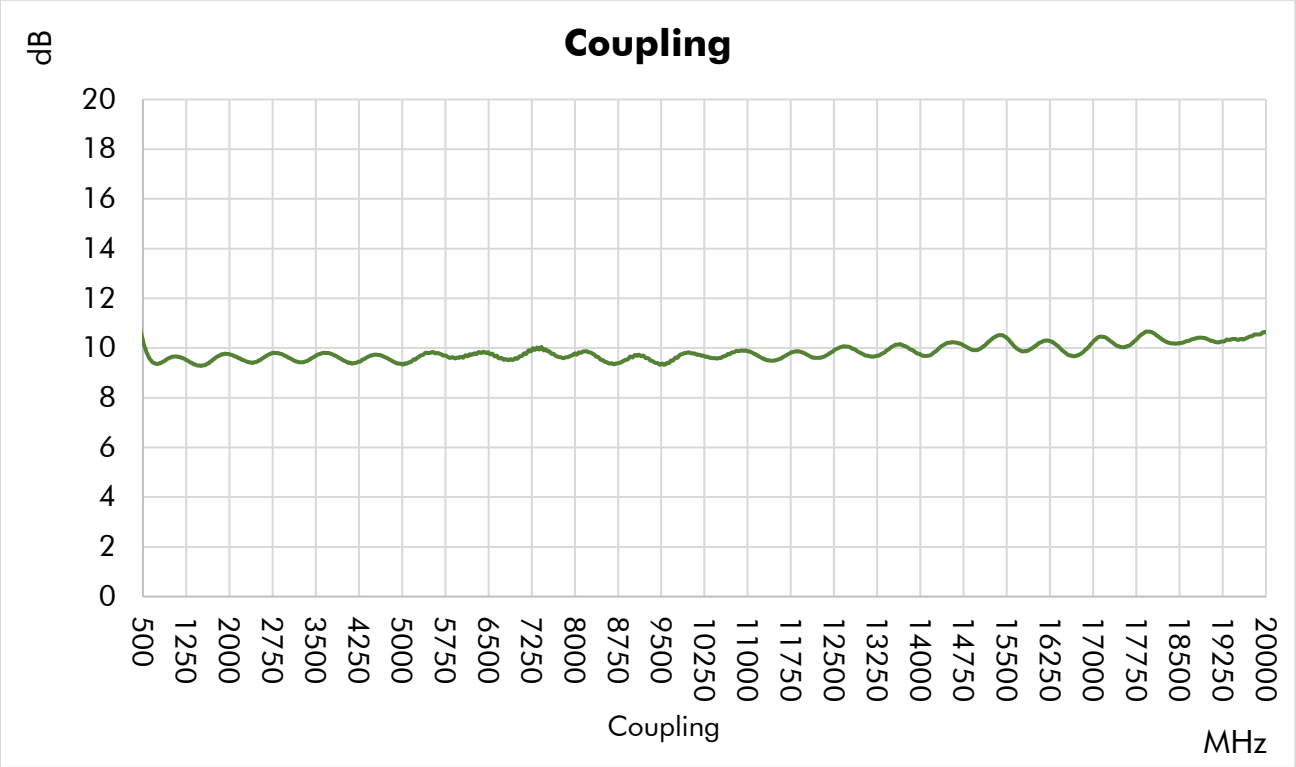
Materials

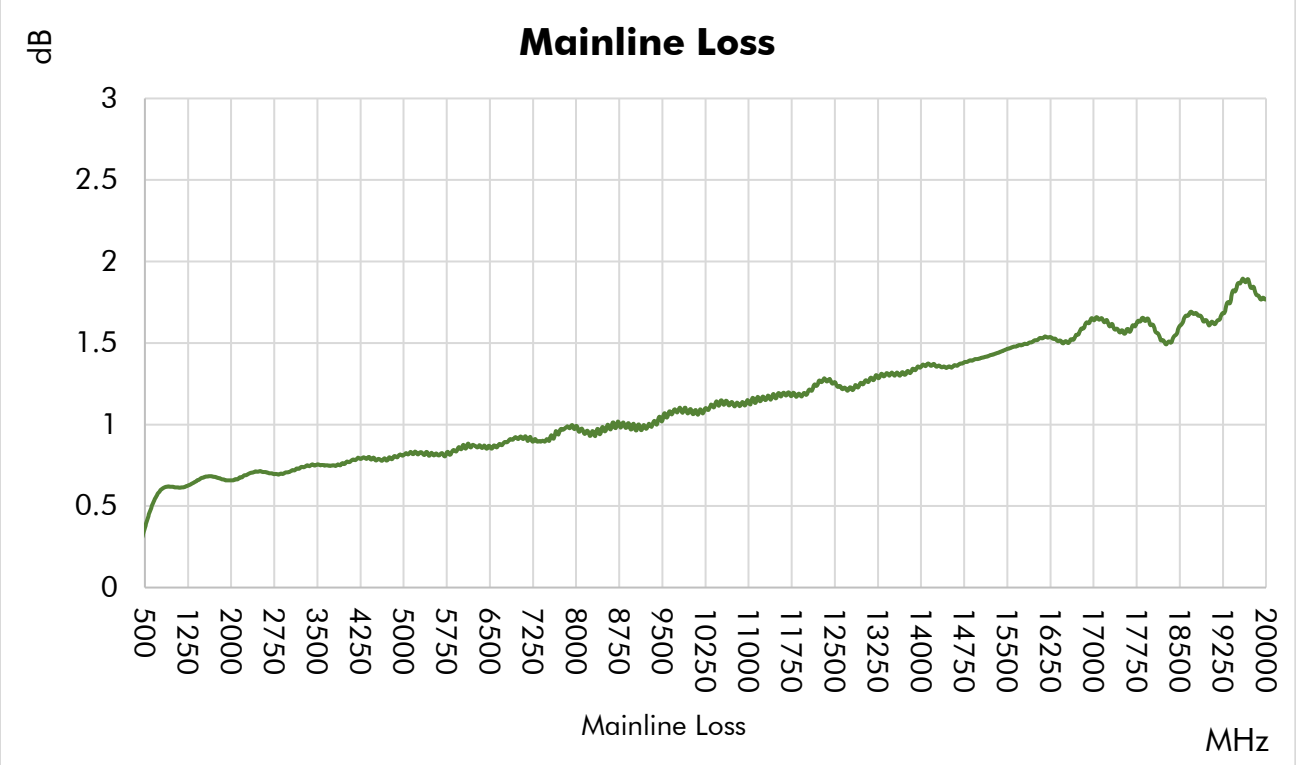
RoHS and REACH Compliant[4]

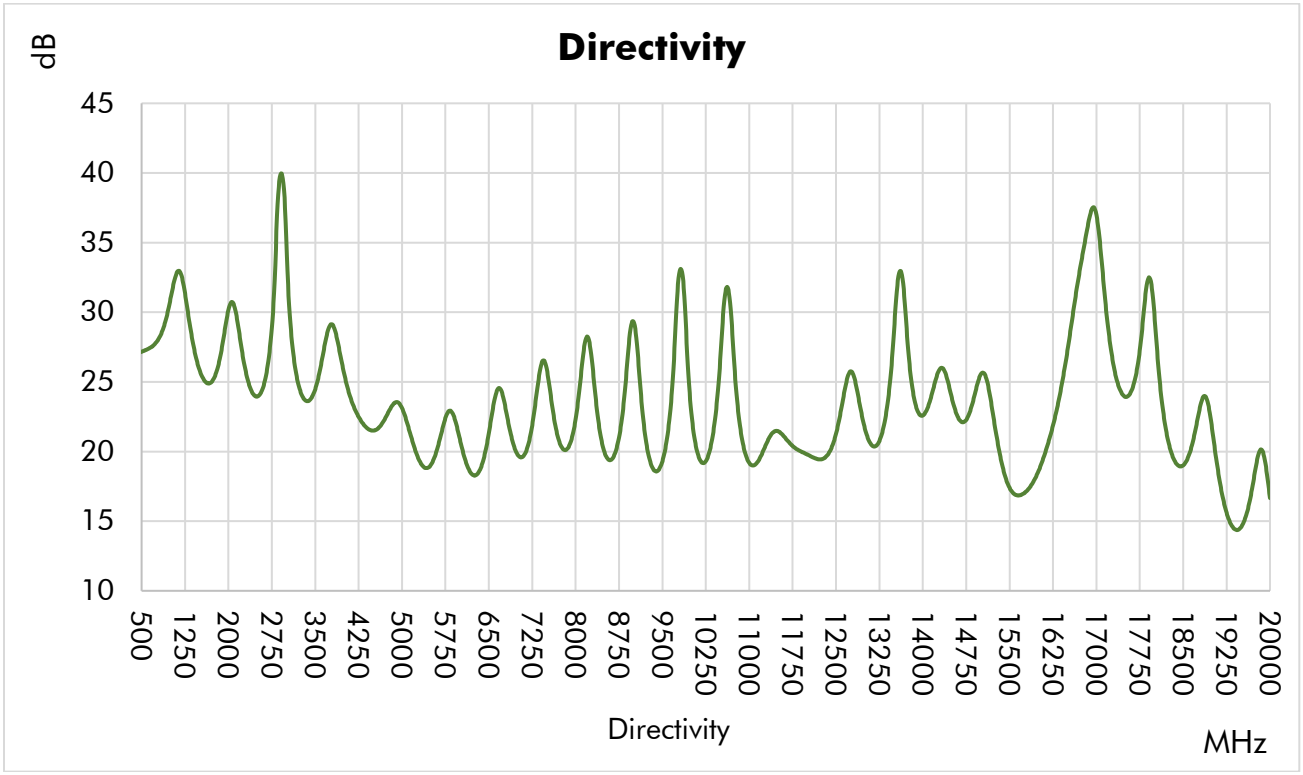
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

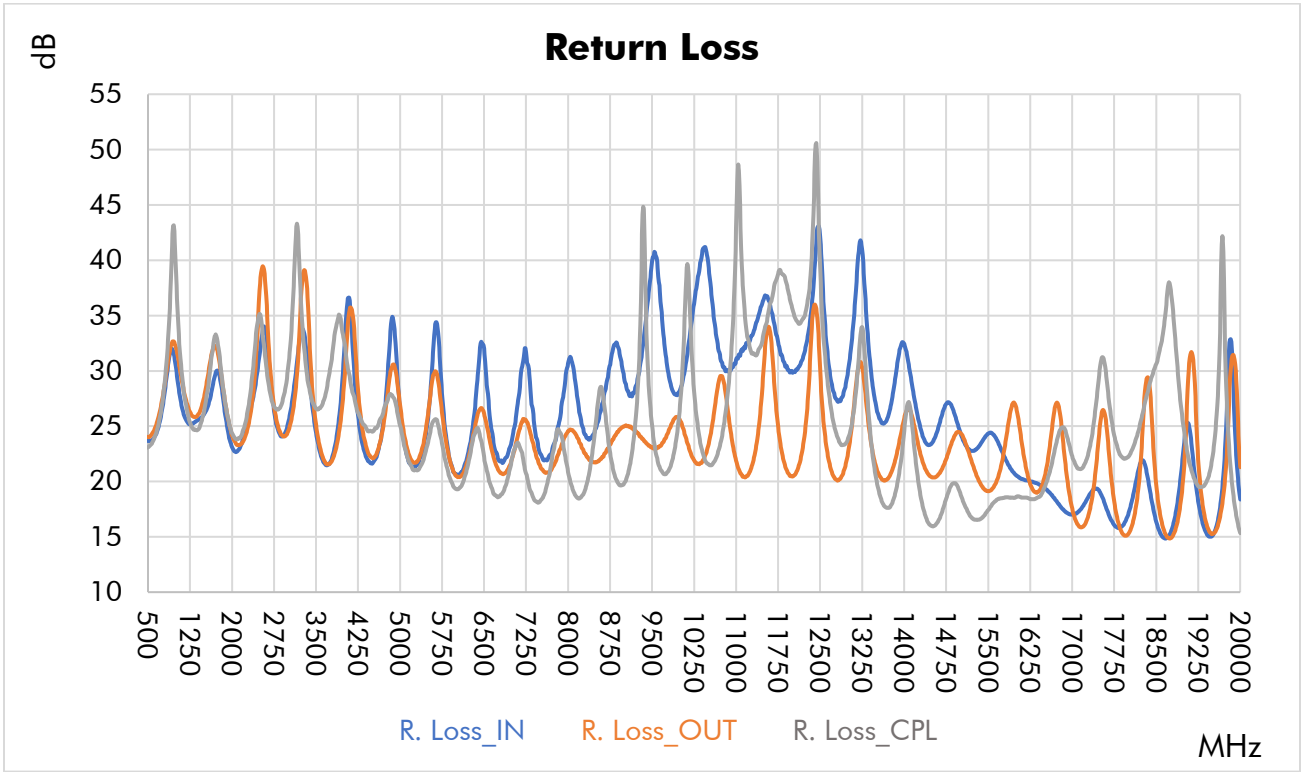
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication.

Typical Performance at +25 °C

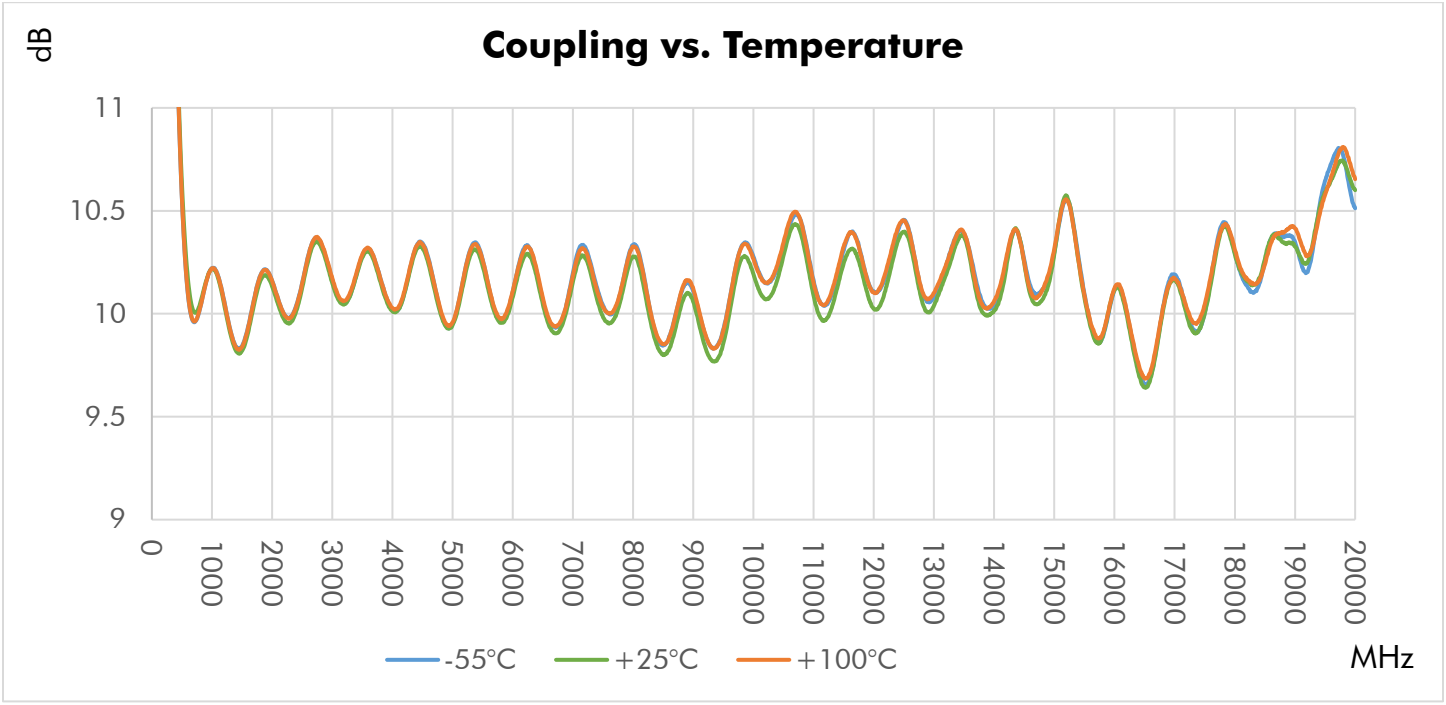


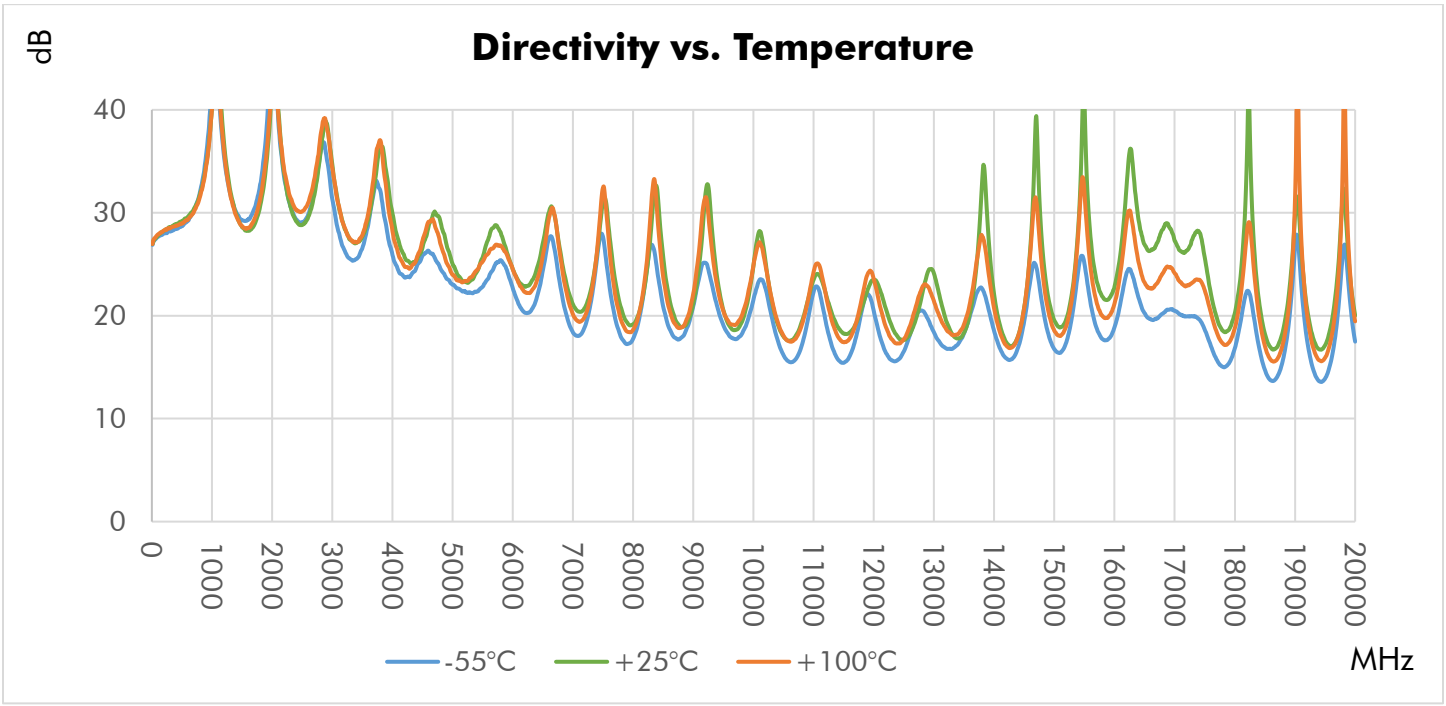


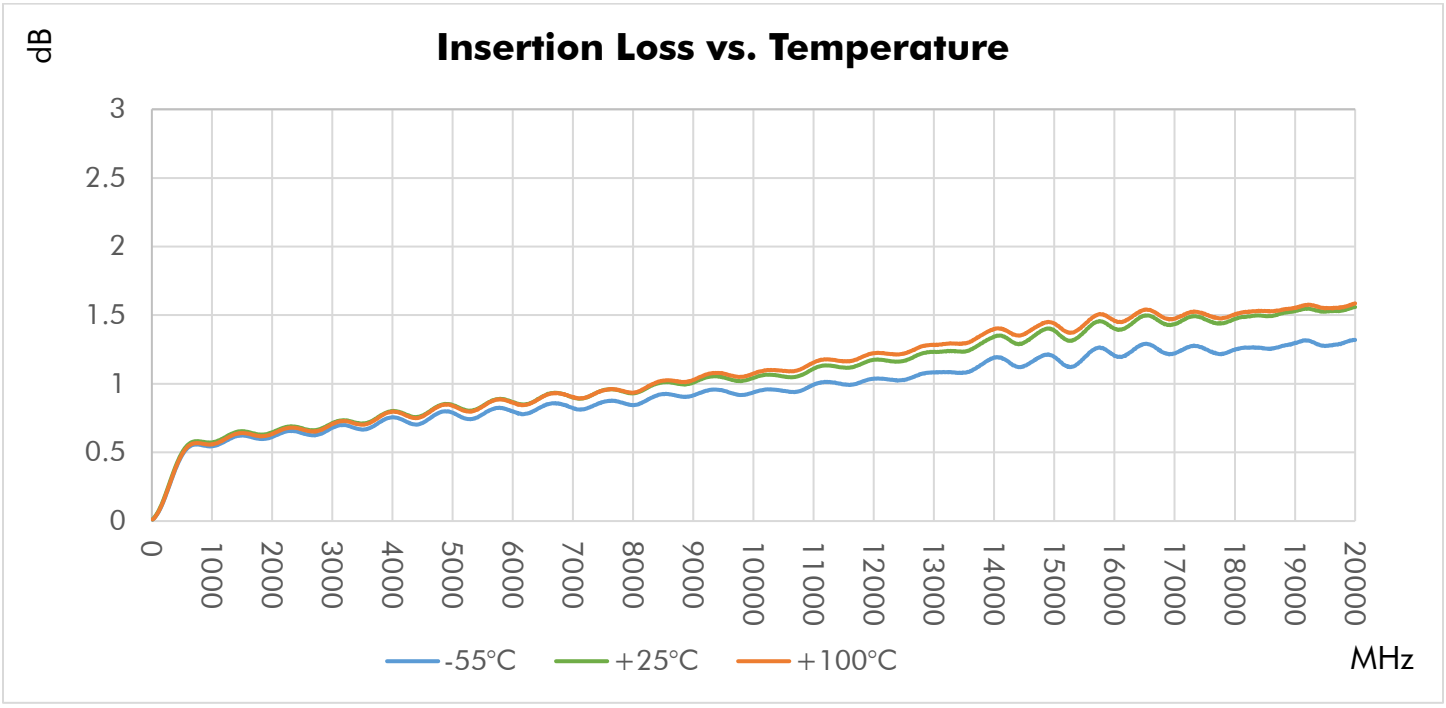

Directivity
dB
45
40
35
30
25
20
15
10
500
1250
2000
2750
3500
4250
5000
5750
6500
7250
8000
8750
9500
10250
11000
11750
12500
13250
14000
14750
15500
16250
17000
17750
18500
19250
20000
Directivity
MHz

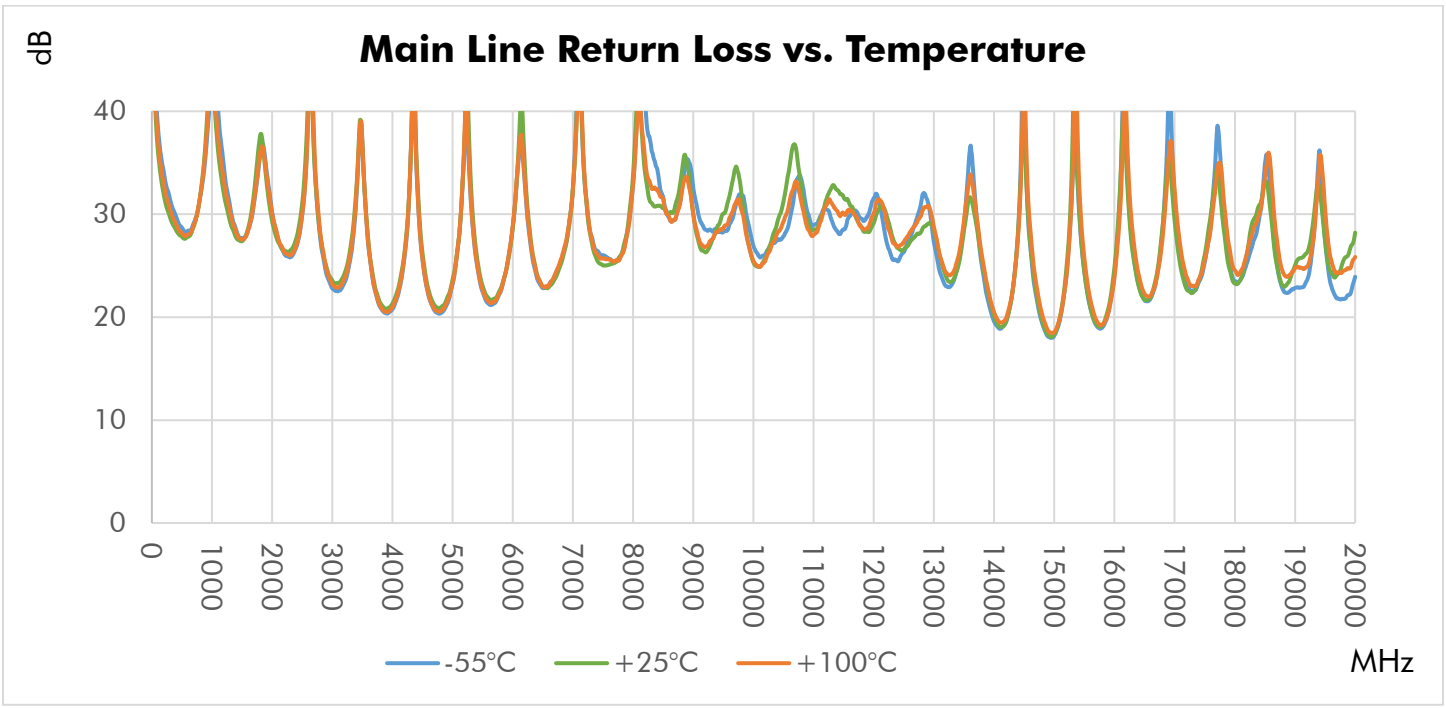

Return Loss
dB
55
50
45
40
35
30
25
20
15
10
500
1250
2000
2750
3500
4250
5000
5750
6500
7250
8000
8750
9500
10250
11000
11750
12500
13250
14000
14750
15500
16250
17000
17750
18500
19250
20000
R. Loss_IN
R. Loss_OUT
R. Loss_CPL
MHz

Typical Performance Over Temperature






Insertion Loss vs. Temperature
dB
3
2.5
2
1.5
1
0.5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000
16000
17000
18000
19000
20000
-55°C
+25°C
+100°C
MHz


Main Line Return Loss vs. Temperature
dB
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000
16000
17000
18000
19000
20000
-55°C
+25°C
+100°C
MHz

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Typical Performance Data

Frequency (MHz)	Return Loss (dB)			Mainline Loss (dB)	Coupling (dB)	Directivity (dB)
	In	Out	Cpl.	In-Out	In-Cpl.	
500	23.5	24.3	23.2	0.6	10.0	27.3
1000	28.4	30.0	36.4	0.6	9.7	32.8
1500	26.7	29.5	27.1	0.7	9.2	25.0
2000	22.7	23.3	24.2	0.7	9.7	31.2
2500	33.8	40.0	34.4	0.7	9.6	24.3
3000	26.6	25.9	31.4	0.7	9.6	28.0
3500	23.0	22.9	26.6	0.8	9.8	25.8
4000	36.1	34.4	32.0	0.8	9.5	24.1
4500	21.6	22.2	24.4	0.7	9.7	21.6
5000	24.3	24.0	24.7	0.8	9.3	22.1
5500	28.0	29.0	24.1	0.8	9.8	19.8
6000	20.9	20.5	19.2	0.8	9.6	19.4
6500	28.5	23.6	21.3	1.0	9.9	23.6
7000	25.2	23.6	22.8	0.8	9.5	19.5
7500	22.4	20.9	18.4	1.0	9.9	23.4
8000	32.3	25.2	20.2	1.1	9.9	24.9
8500	25.8	21.8	26.8	0.9	9.5	19.2
9000	27.6	24.3	20.0	1.0	9.3	26.2
9500	43.3	23.7	24.0	1.2	9.6	20.8
10000	28.9	24.3	28.6	1.0	9.8	20.0
10500	37.5	24.9	21.5	1.2	9.7	33.1
11000	32.8	21.1	49.1	1.0	9.8	18.9
11500	37.6	37.0	34.0	1.3	9.5	21.2
12000	29.5	20.4	35.4	1.2	9.7	19.6
12500	36.9	24.1	36.0	1.3	10.0	22.8
13000	32.0	25.4	24.3	1.3	9.8	20.6
13500	25.4	20.1	19.7	1.3	10.1	34.8
14000	31.7	27.2	25.9	1.4	9.7	23.0
14500	23.9	20.4	15.9	1.3	10.2	22.6
15000	23.7	23.9	18.6	1.4	10.0	25.8
15500	24.4	19.3	17.6	1.5	10.3	16.9
16000	20.4	24.3	18.7	1.5	10.1	19.5
16500	19.3	22.1	19.7	1.6	9.8	29.6
17000	17.1	16.2	21.9	1.6	10.3	34.0
17500	18.3	27.7	31.3	1.5	10.0	24.0
18000	17.8	15.9	22.4	1.6	10.7	25.1
18500	15.5	16.7	30.9	1.7	10.2	19.5
19000	26.0	28.3	23.7	1.6	10.3	19.0
19500	15.5	15.5	22.9	2.1	10.4	15.3
20000	16.7	17.2	15.0	1.9	10.7	14.0

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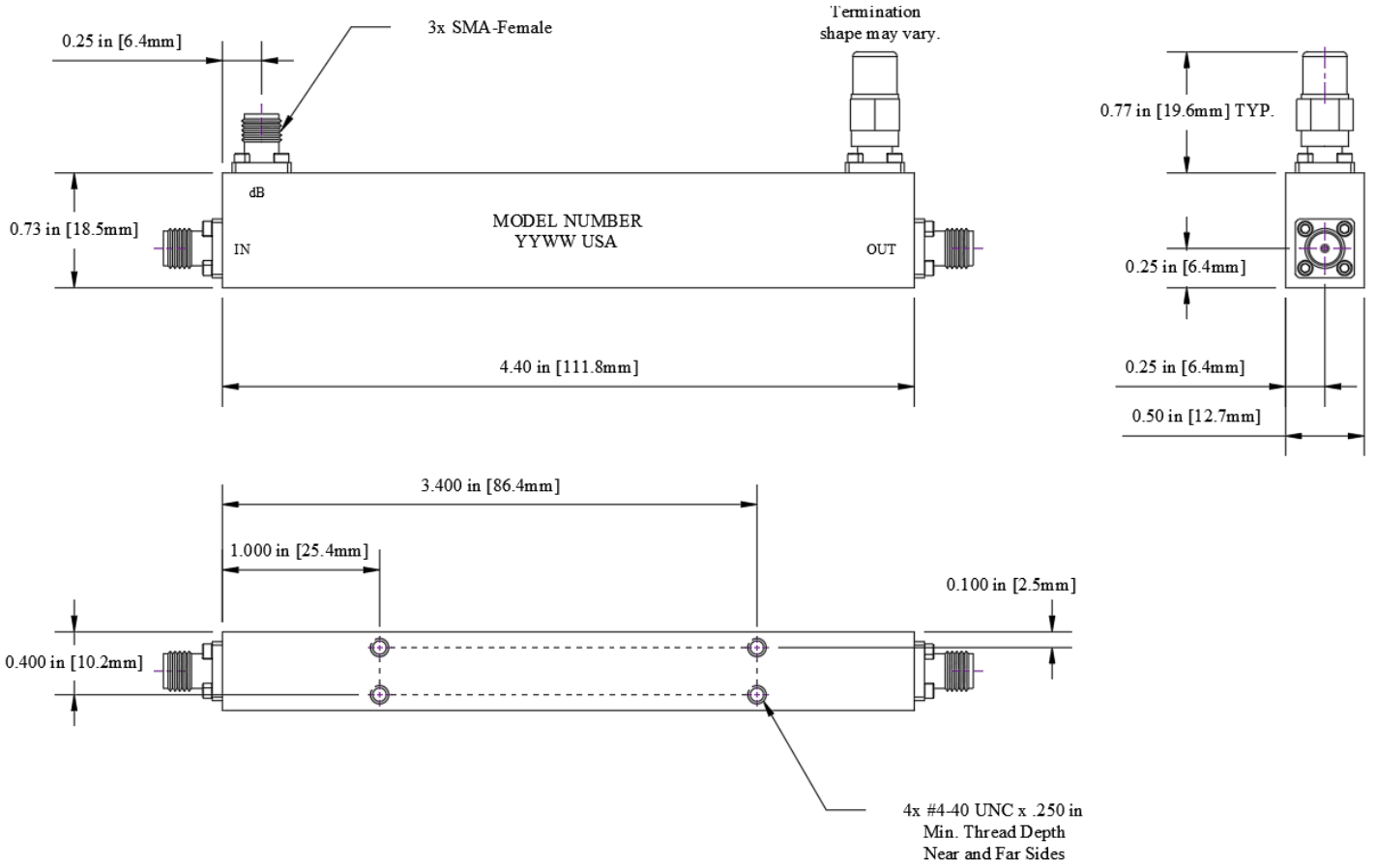
Outline Dimensions



Outline # OL-1185
Dimensions are in inches, [mm] shown for convenience.
Tolerances on 2-pl decimals: ±.03. 3-pl decimals: ± .015.