WERBEL MICROWAVE LLC
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90° Hybrid, 4-8GHz, SMA Female

WMQH-4-8-S

Key Features

- Octave band.
- High isolation.
- Excellent return loss.
- Low unbalance.

Photo is representative.

WMQH-4-8-S is a 90-degree hybrid that covers C band applications in an aluminum enclosure measuring 1.00 x 0.50 x 0.38 inches. The 4-8GHz frequency response has typical 23dB isolation between outputs, and 1.15:1 typical VSWR. Werbel's unique approach to stripline devices allows for tight phase balance in production quantities with minimal time to delivery. Assembled and tested in USA.

Specifications	Min.	Typ.	Max.	Units
Frequency	4	--	8	GHz
Impedance	--	50	--	Ohm
Phase Difference	--	90	--	Degrees
Total Loss[1] (J1-J3 and J1-J4)	--	3.2±0.4	±0.9	dB
Isolation	16	23	--	dB
Return Loss (all ports)	17	24	--	dB
Amplitude Balance	--	0.43	1.4	dB
Phase Balance (±)	--	1.85	4.0	Degrees
Input Power (CW)[2]	--	--	50	Watts

Mechanical

Connector Interface	SMA-Female
Operating Temperature[3]	-40 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	0.6 oz (16.7 g)
Humidity	10-90% non-condensing
Environment	Indoor Use Only

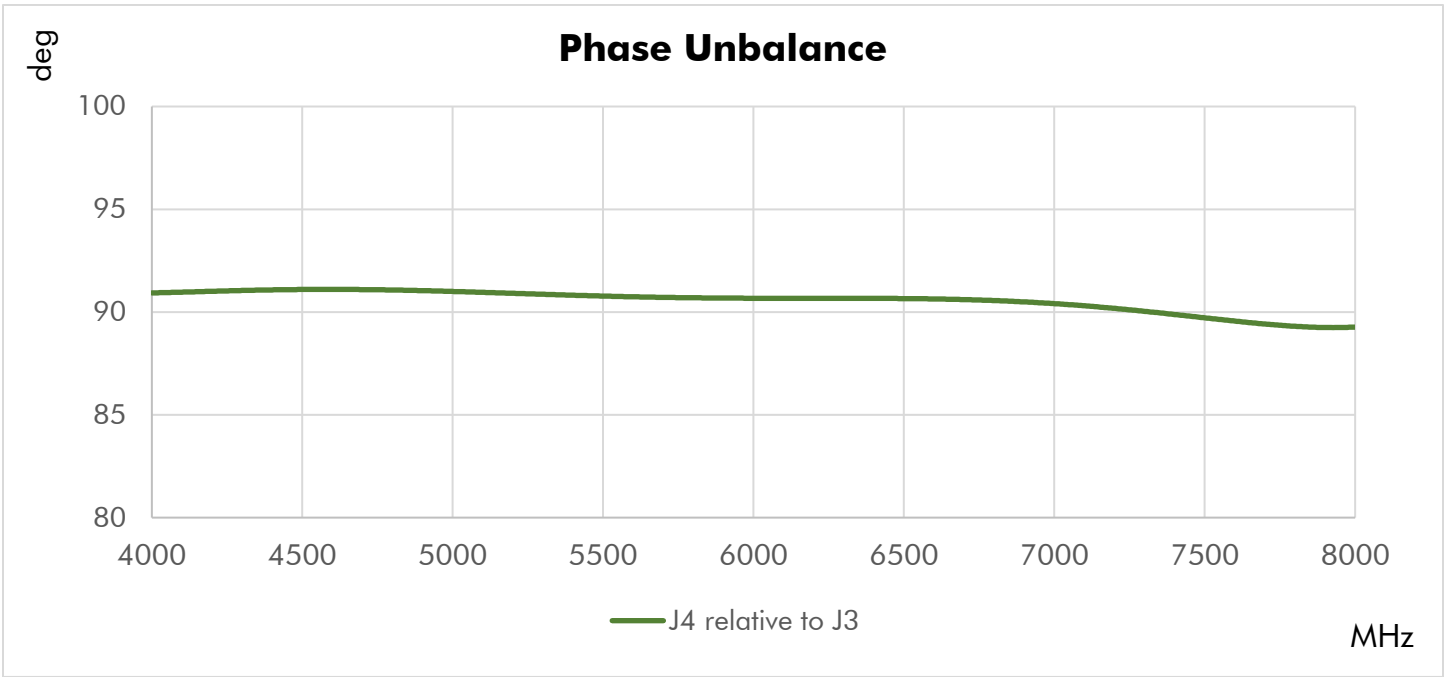
Materials

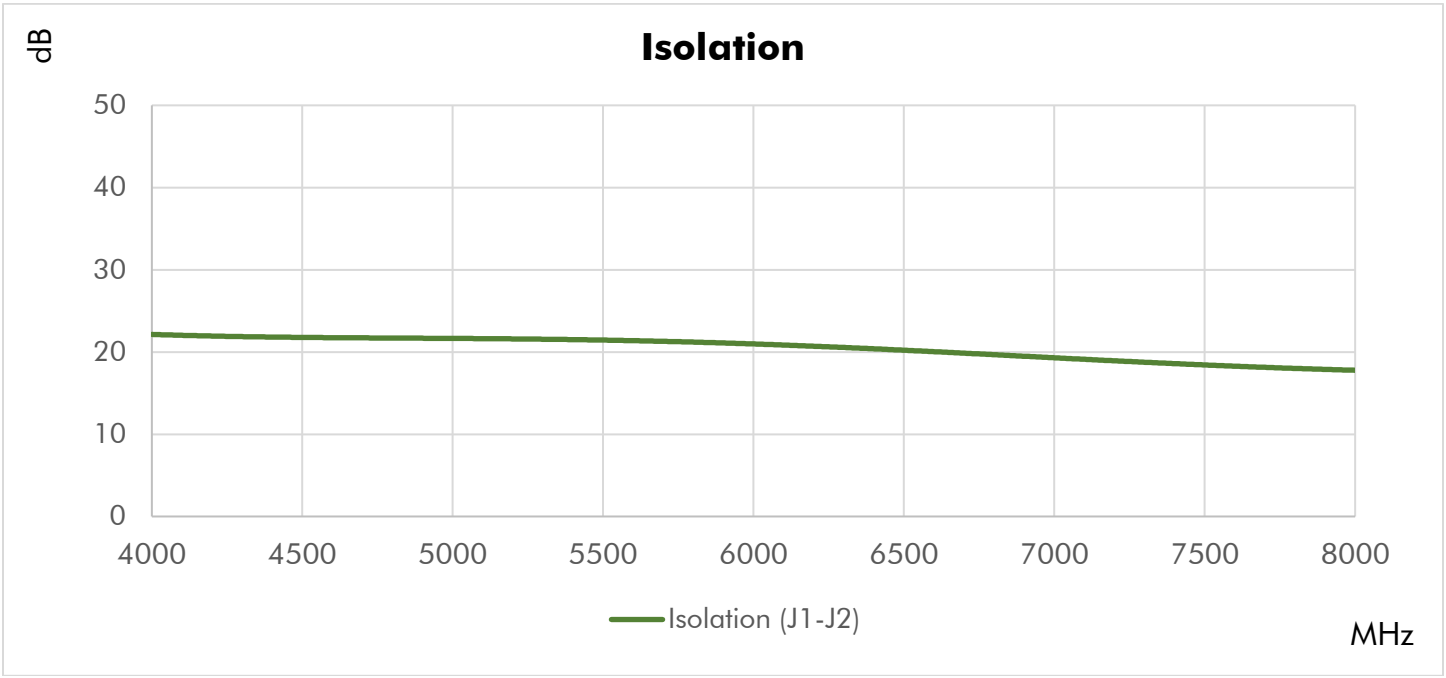
RoHS and REACH Compliant[4]

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

1. Total Loss includes insertion loss and frequency sensitivity.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Specifications are at +25°C.
4. To the best of our knowledge at the time of publication.

Typical Performance at +25 °C



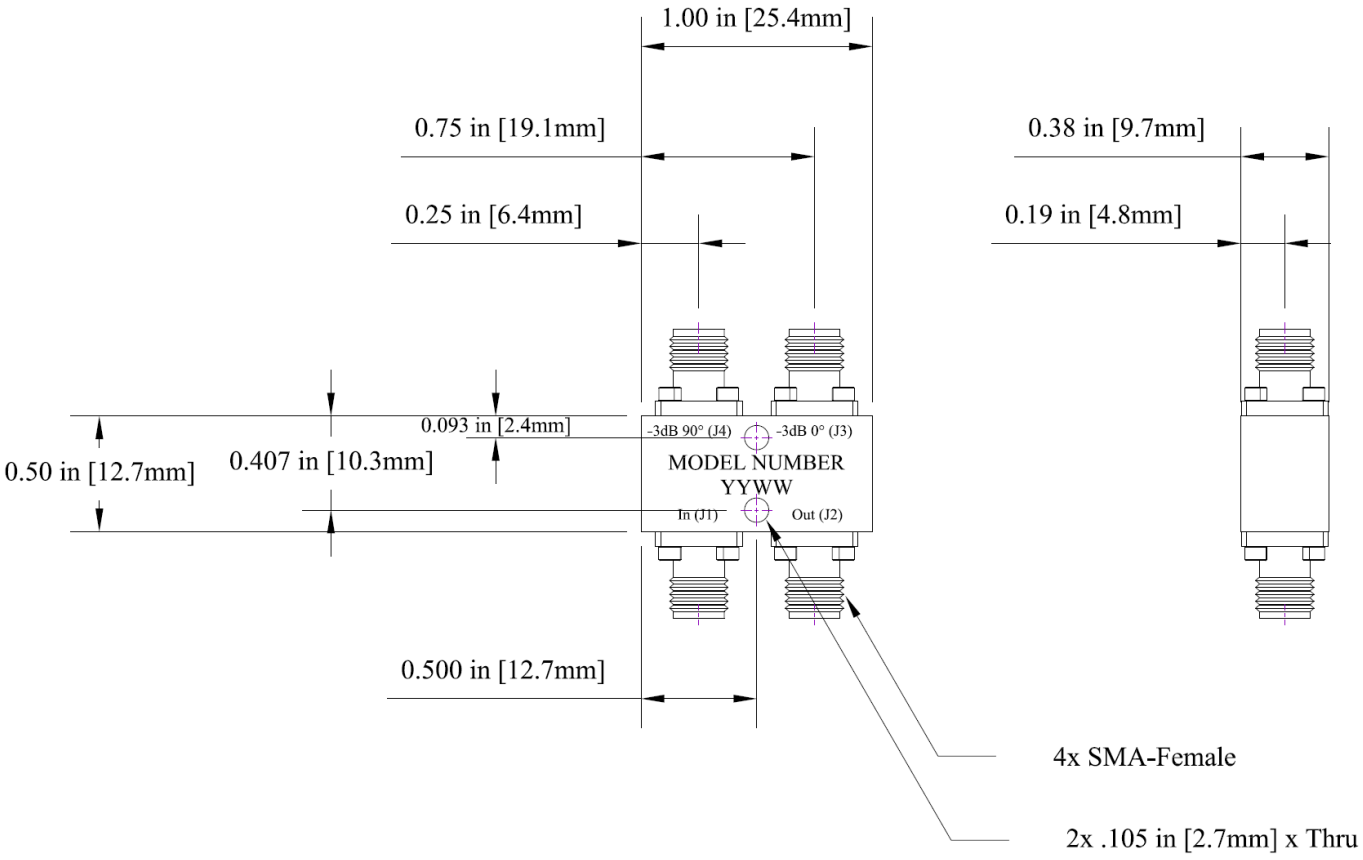

Isolation
dB
50
40
30
20
10
0
4000
4500
5000
5500
6000
6500
7000
7500
8000
Isolation (J1-J2)
MHz


Return Loss
dB
50
40
30
20
10
0
4000
4500
5000
5500
6000
6500
7000
7500
8000
Input
Output
MHz

Typical Performance at +25 °C

Frequency (MHz)	Insertion Loss (dB) J1-J3	Coupling (dB) J1-J4	Amplitude Unbalance (dB)	Phase Unbalance (deg)	Isolation (dB) J1-J2	Return Loss (dB) J1
4000	2.6	3.3	0.7	90.3	22.1	21.4
4200	3.1	3.3	0.3	89.9	21.9	23.6
4400	3.1	3.2	0.1	89.6	21.8	23.5
4600	3.2	3.1	0.1	90.4	21.8	23.0
4800	3.3	3.1	0.2	89.8	21.7	23.8
5000	3.3	3.0	0.4	89.6	21.6	23.9
5200	3.5	3.0	0.6	90.2	21.7	23.1
5400	3.5	2.9	0.6	88.8	21.5	23.2
5600	3.6	2.9	0.7	89.1	21.4	23.5
5800	3.7	2.9	0.8	89.2	21.3	23.2
6000	3.6	2.8	0.8	89.1	21.0	22.3
6200	3.6	2.8	0.8	89.0	20.7	23.1
6400	3.5	2.8	0.7	88.9	20.3	22.6
6600	3.5	2.8	0.7	89.0	20.0	22.3
6800	3.2	2.6	0.6	89.0	19.4	22.1
7000	3.5	2.8	0.6	88.4	19.2	22.0
7200	3.6	3.1	0.5	87.7	19.1	21.7
7400	3.4	3.0	0.4	87.7	18.6	21.5
7600	3.6	3.3	0.4	86.7	18.4	21.3
7800	3.6	3.5	0.1	86.4	18.4	21.7
8000	3.2	3.3	0.1	86.8	17.8	21.5

Outline Dimensions



Outline # OL-Q0408
Dimensions are in inches, [mm] shown for convenience.
Tolerances on 2-pl decimals: ±.03. 3-pl decimals: ± .015.

Port Configuration

		OUTPUT			
		J1	J2	J3	J4
INPUT	J1	--	ISO	0°	+90°
	J2	ISO	--	+90°	0°
	J3	0°	+90°	--	ISO
	J4	+90°	0°	ISO	--