

90° Quadrature Hybrid, 1-2GHz, SMA-Female

WMQH-1-2-S

Key Features

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

Model WMQH-1-2-S covers the L band 1-2GHz in quadrature with 90 degrees phase shift between outputs and 3dB coupling factor. Isolation 24dB typical. Return loss 24dB typical. Excellent performance with minimal reflection. Amplitude and phase balance are tightly controlled. Werbel Microwave designs, assembles, and tests the stripline hybrid coupler in the USA.



Photo is representative.

Specifications	Min.	Typ.	Max.	Units
Frequency	1	--	2	GHz
Impedance	--	50	--	Ohm
Phase Difference	--	90	--	Degrees
Total Loss ¹ (IN-0° and IN-90°)	--	3.16±0.55	--	dB
Isolation	21	24	--	dB
Return Loss (all ports)	20	24	--	dB
Amplitude Balance	--	0.44	1.4	dB
Phase Balance (±)	--	1.10	3.0	Degrees
Input Power (CW) ²	--	--	50	Watts

Mechanical

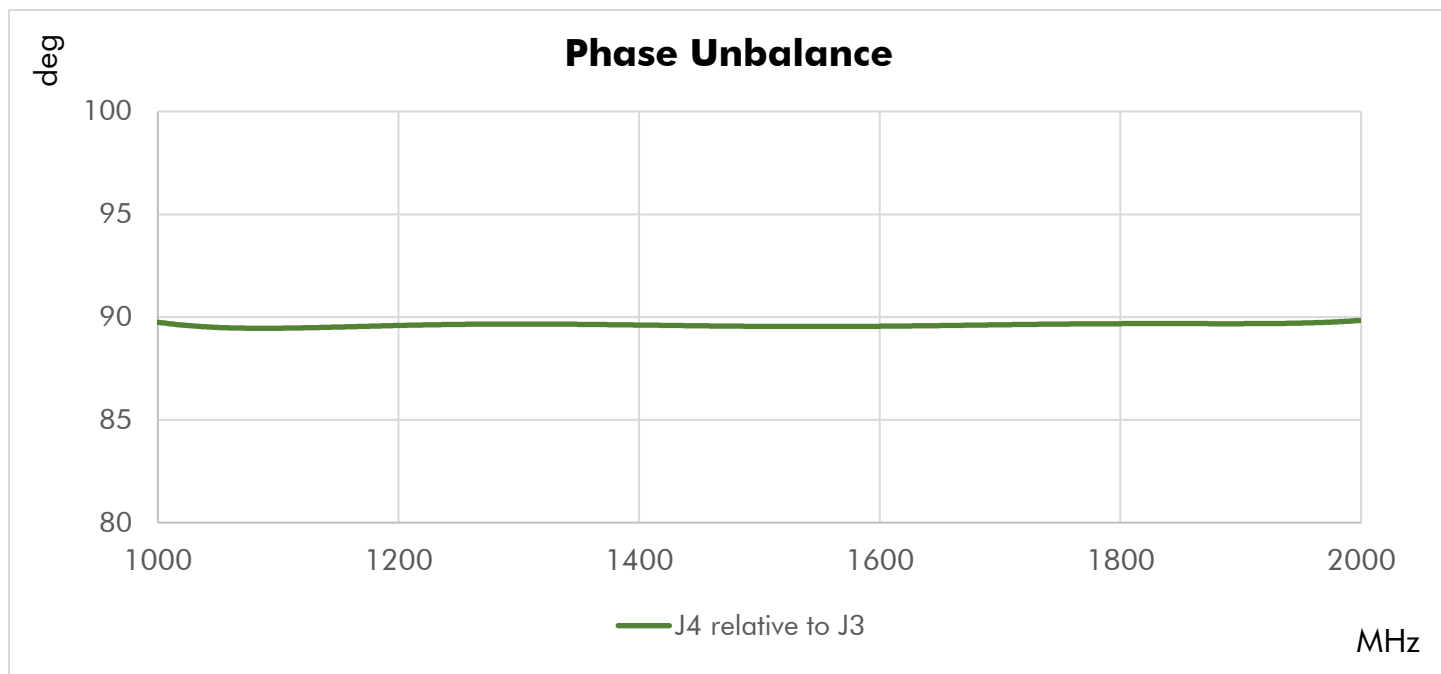
Connector Interface	SMA-Female
Operating Temperature ³	-40 to +85 °C
Storage Temperature	-55 to +100 °C
Weight	0.8 oz (23.2 g)
Humidity	10-90% non-condensing
Environment	Indoor Use Only

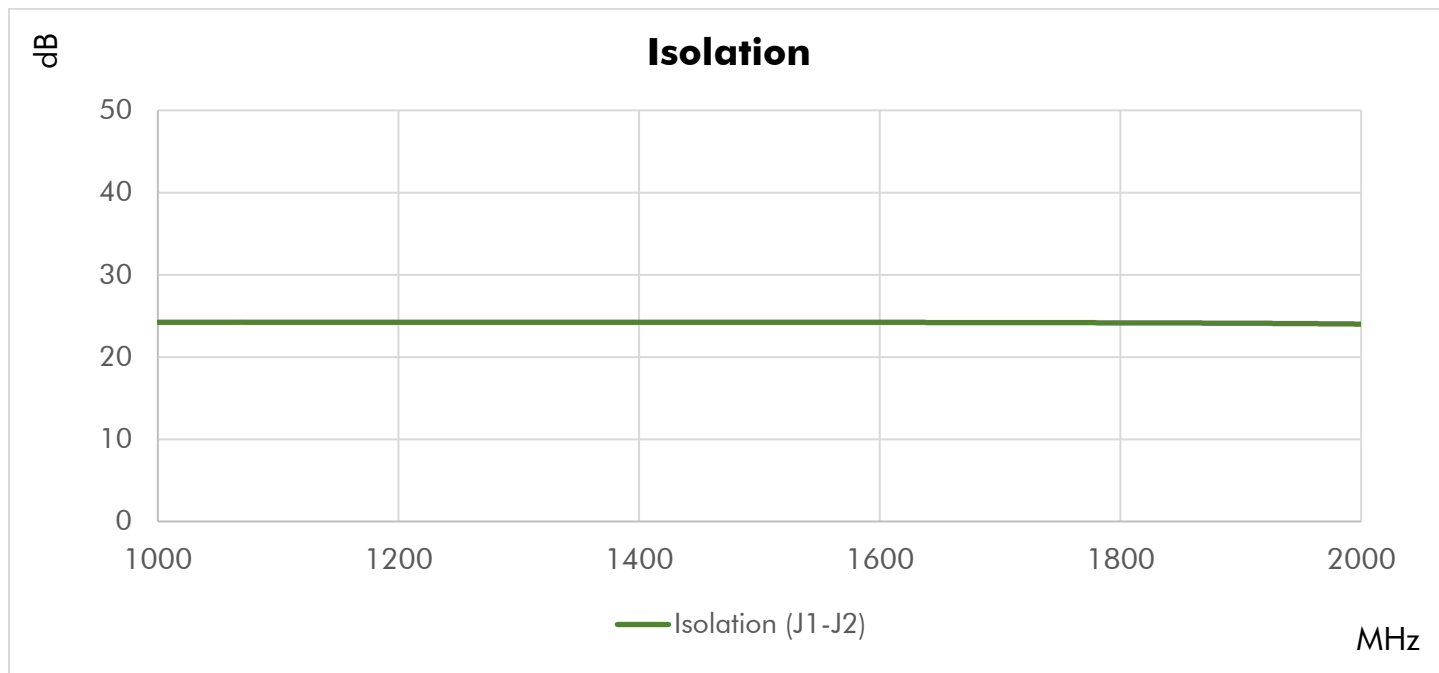
1. Total Loss includes insertion loss and frequency sensitivity.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Specifications are at +25°C.
4. To the best of our knowledge at the time of publication.

Materials

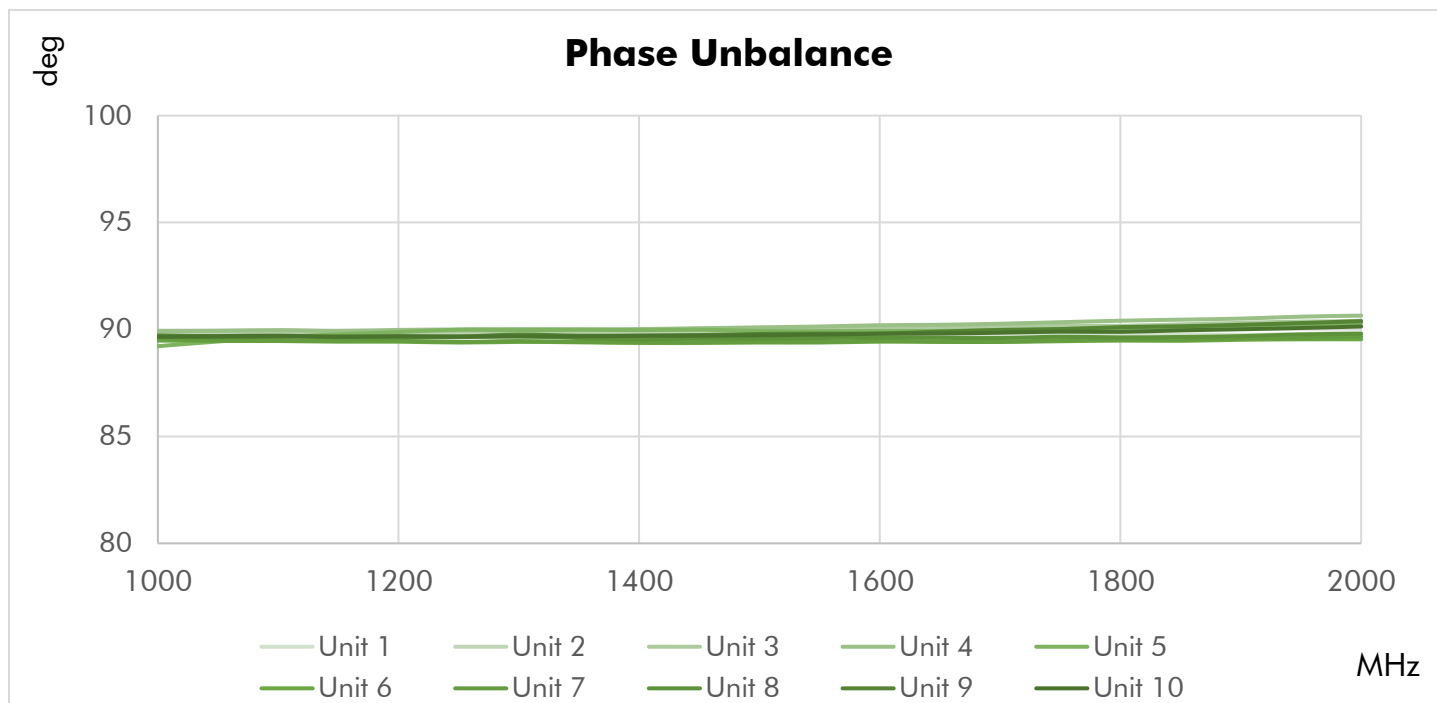
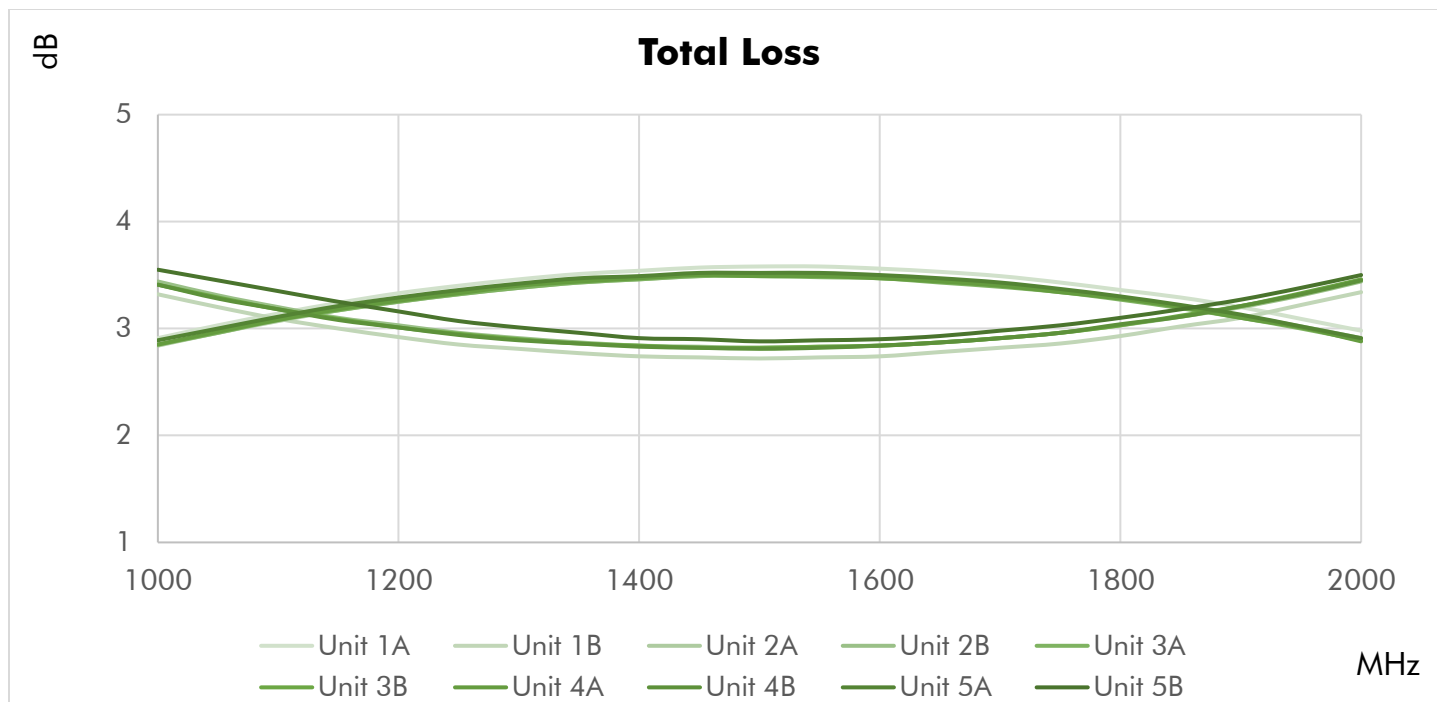
RoHS and REACH Compliant ⁴	
Enclosure	Aluminum
Connectors	Stainless Steel
Contacts	Be Cu, Gold Plated
Insulators	PTFE
Finish	Green Paint

Typical Performance at +25 °C





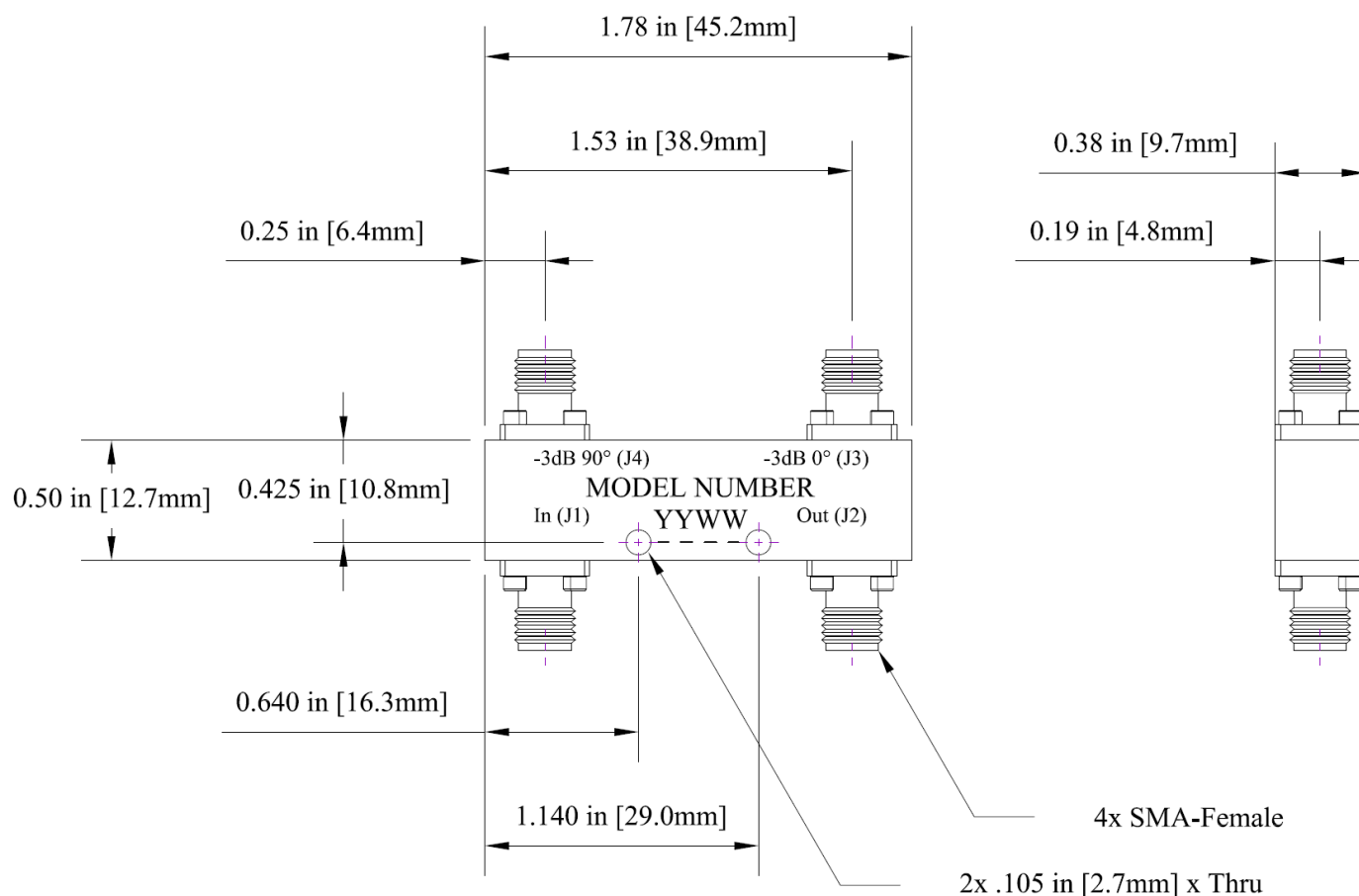
Repeatability in Production



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
1000	2.9	3.5	0.5	89.8	24.2	22.1
1050	3.0	3.3	0.3	89.6	24.3	23.7
1100	3.1	3.2	0.1	89.1	24.2	23.6
1150	3.1	3.0	0.1	89.6	24.2	24.3
1200	3.2	2.9	0.3	89.6	24.2	23.2
1250	3.3	2.9	0.4	90.0	24.2	23.4
1300	3.5	3.0	0.6	89.4	24.2	23.6
1350	3.5	2.9	0.6	89.8	24.3	23.9
1400	3.6	2.9	0.7	90.2	24.3	24.6
1450	3.6	2.8	0.8	89.4	24.3	24.1
1500	3.7	2.8	0.8	89.5	24.3	23.8
1550	3.6	2.8	0.8	89.2	24.3	24.2
1600	3.5	2.8	0.7	89.5	24.3	24.7
1650	3.7	3.0	0.7	89.9	24.3	24.6
1700	3.5	2.9	0.6	89.5	24.2	24.5
1750	3.4	2.9	0.5	89.7	24.2	24.7
1800	3.3	3.0	0.4	89.6	24.2	24.8
1850	3.3	3.0	0.2	89.6	24.2	25.1
1900	3.1	3.2	0.0	89.8	24.1	25.0
1950	3.0	3.3	0.3	89.5	24.0	25.0
2000	2.9	3.4	0.5	89.9	24.0	25.8

Outline Dimensions



Outline # OL-Q0102

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

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

Port Configuration

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

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(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.