

### 3 dB QUADRATURE HYBRID

**QH-0440**

The QH-0440 is a 4-40 GHz, multi-purpose broadband 3dB quadrature hybrid. The multisection tri-plate stripline design exhibits excellent amplitude balance with broadband quadrature phasing (90°) between the output ports. Applications include single sideband upconverters, image rejection downconverters, IQ modulators, balanced amplifiers, microwave correlators and microwave Butler matrices. Custom designs are also available; contact the factory for details.



#### Features

- Broadband performance
- Excellent amplitude and phase balance
- High isolation
- Low VSWR
- [Microwave Power Dividers & Couplers App Note](#)

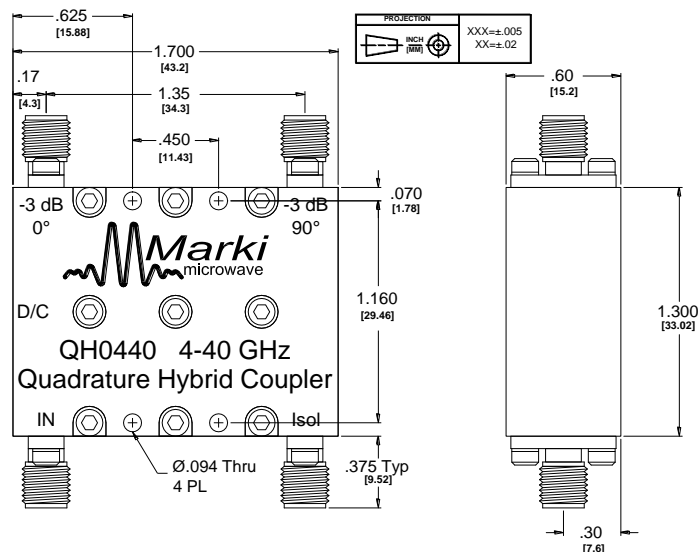
#### Electrical Specifications

Parameter <sup>1</sup>	Frequency Range (GHz)	Min	Typ	Max
Coupling (dB)	4-40		3	
Phase Shift (Degrees)			90	
Amplitude Balance (dB) <sup>2</sup>			±0.4	±1.2
Phase Balance (Degrees)			±5	±12
Excess Through Line Insertion Loss (dB) <sup>3</sup>				2
VSWR	4 to 30			1.65
	30 to 40		1.9	
Isolation (dB)	4 to 30	13	18	
	30 to 40	8	12	
Weight (g)			70	

<sup>1</sup>Specifications guaranteed when operated in a 50Ω system.

<sup>2</sup>Maximum amplitude *differential* is twice the magnitude of the amplitude *balance* (see Fig. 3).

<sup>3</sup>Excess Insertion Loss = (Input to Output Insertion Loss) – 3 dB.



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#### Typical Performance

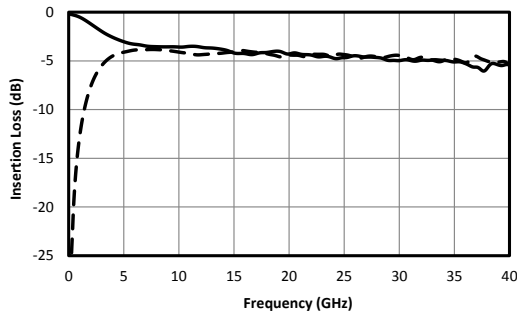


Fig. 1. Through and coupled line insertion loss.

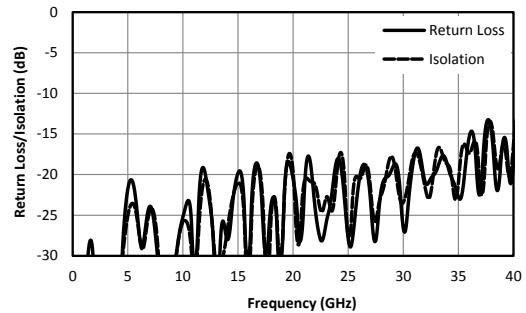


Fig. 2. Typical port return loss and isolation (all ports 50 Ω terminated).

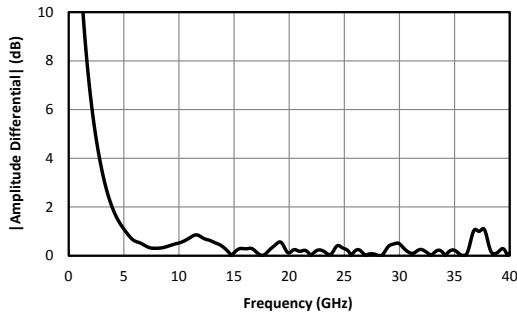


Fig. 3. Amplitude difference between the 0° and 90° output ports.

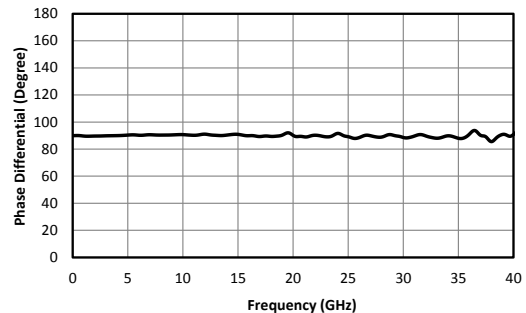


Fig. 4. Phase difference between the 0° and 90° output ports.

Model Number	Description
QH-0440	4-40 GHz 3 dB Quadrature Hybrid with 2.92 mm connectors <sup>1</sup>

<sup>1</sup>Default is 2.92 mm female connectors. Consult factory for other connector options.

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