

## PRODUCT DATA SHEET

QH12404

### Our patented 3 dB 90° Hybrid Couplers provide:

- Superior component performance starting at 3:1 Bandwidth.
- Thicker center boards for high power and increased repeatability.
- Bonded structures which eliminate any air gaps between substrates.
- More sections per bandwidth for better coupling flatness.
- Electrically shorter and physically smaller RF components.

### Features:

High Power      Wide Bandwidths      Small Size      Excellent Amplitude Balance

### Electrical Specifications:

Frequency: 2000 - 6000 MHz  
Power: 150 W CW  
Insertion Loss: 0.55 dB Max.  
VSWR: 1.35:1 Max.  
Phase Balance:  $\pm 5^\circ$  dB Max.  
Amplitude Balance:  $\pm 0.6$  dB Max.  
Isolation: 18 dB Min.

### Mechanical Specifications:

Type: Surface Mount  
Plating Options: QH12404-Ag: Immersion Silver (RoHS)  
QH12404-Pb: Electrodeposited Tin/Lead  
Size: 1.20 x 0.45 x 0.087"  
Weight: 5 grams

### Port Configurations:

| J1          | J2          | J3          | J4          |
|-------------|-------------|-------------|-------------|
| Input       | -3 dB, 0°   | -3 dB, +90° | Isolated    |
| -3 dB, 0°   | Input       | Isolated    | -3 dB, +90° |
| -3 dB, +90° | Isolated    | Input       | -3 dB, 0°   |
| Isolated    | -3 dB, +90° | -3 dB, 0°   | Input       |

**Werlatone's** breakthrough technology allows us to build our existing line of Broadband 3 dB High Power 90° Hybrid Couplers. Connectorized 3 dB 90° Hybrid Coupler models are available with a choice of connectors. Several of our existing High Power 3 dB 90° RF Couplers are three port designs, wherein the difference port is internally terminated with a high power termination. This eliminates the need for a customer supplied external load for each Hybrid Coupler.

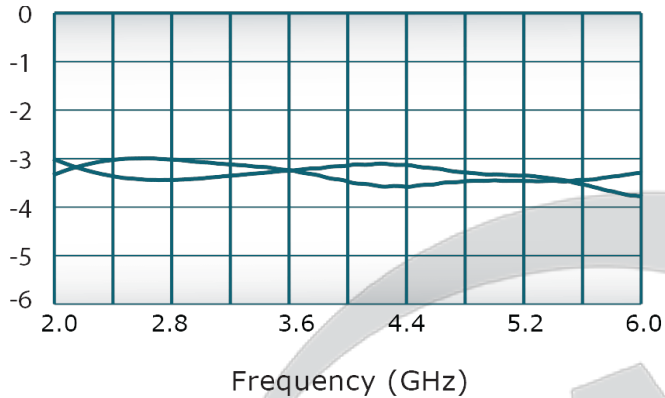


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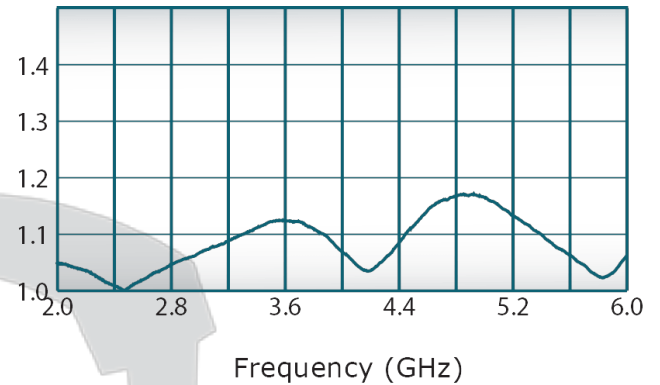
QH12404

### Performance Data (Specifications subject to change without notice):

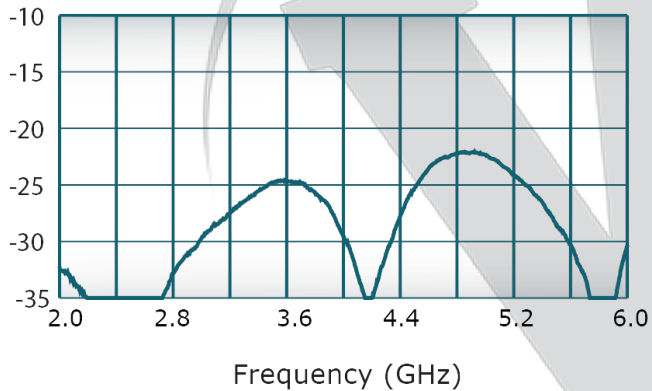
Coupling:



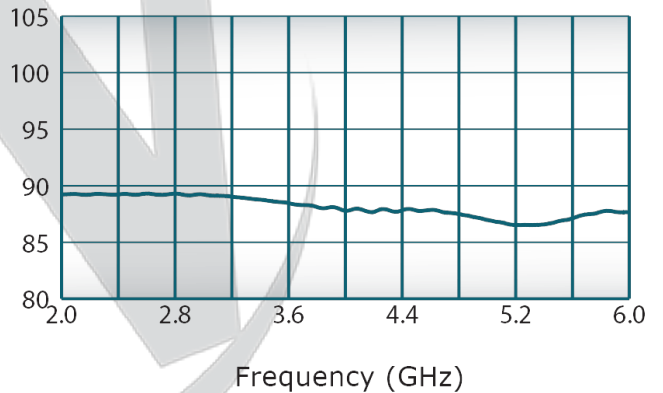
VSWR:



Isolation:

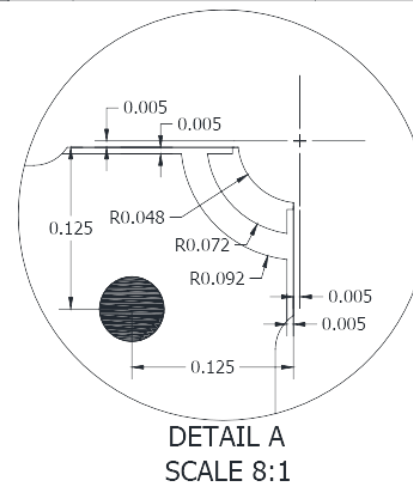
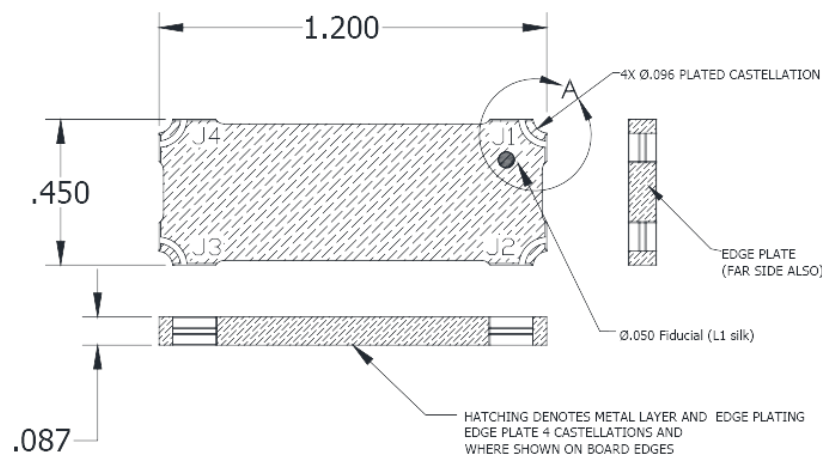


Phase Balance:



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|   | A                | B               | C        | D        |
|---|------------------|-----------------|----------|----------|
| 1 | REVISION HISTORY |                 |          |          |
| 2 | REV              | REVISION RECORD | DATE     | APPROVED |
| 3 | -                | INITIAL RELEASE | 7/1/2022 | BW       |
| 4 |                  |                 |          |          |
| 5 |                  |                 |          |          |
| 6 |                  |                 |          |          |



## ELECTRICAL SPECIFICATIONS

|                             |               |
|-----------------------------|---------------|
| Frequency:                  | 2.0 - 6.0 GHz |
| Power:                      | 150 Watts CW  |
| Insertion Loss:             | 0.55 dB Max.  |
| Amplitude Balance:          | ±0.6 dB Max.  |
| Phase Balance:              | 90° ± 5° Max. |
| VSWR:                       | 1.35:1        |
| Isolation:                  | 18 dB Min.    |
| Temperature<br>(Operating): | -55 to +85 °C |

PART MARKING  
(BLACK EPOXY ON TOP SURFACE)



SCALE 1:1

| Port Configurations |             |             |             |
|---------------------|-------------|-------------|-------------|
| J1                  | J2          | J3          | J4          |
| Input               | -3 dB, 0°   | -3 dB, +90° | Isolated    |
| -3 dB, 0°           | Input       | Isolated    | -3 dB, +90° |
| -3 dB, +90°         | Isolated    | Input       | -3 dB, 0°   |
| Isolated            | -3 dB, +90° | -3 dB, 0°   | Input       |

**NOTES: UNLESS OTHERWISE SPECIFIED**

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1. SURFACE MOUNT UNIT
  2. SURFACE FINISH: IMMERSION SILVER (RoHS Compliant).
  3. OTHER SURFACE FINISHES AVAILABLE UPON REQUEST.
  4. UNIT INTENDED TO BE SOLDERED TO A MICROSTRIP SUBSTRATE.  
FOR MORE INFO, REQUEST APPLICATION NOTE

|                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                              |           |                                                                                                                                              |           |           |                                          |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|------------------------------------------|--|--|--|
| <div>UNLESS OTHERWISE SPECIFIED</div> <ul style="list-style-type: none"><li>• INTERPRET DRAWING YIELD-STD-100</li><li>• DIMENSIONING PER ASME Y14.5M-2009</li><li>• PARENTHEITICAL INFO FOR REF ONLY</li><li>• DIMENSIONAL AREA IN INCHES</li><li>• DIMENSIONAL LIMITS APPLY BEFORE PROCESSES</li></ul> <div>• TOLERANCES: ANGLES ± 2°<br/>3 PL ± .010<br/>2 PL ± .015</div> | DWN                                                                                                          | DATE      | <div><div></div><div>WERLATONE   SINCE 1965</div></div> |           |           | 17 Jon Barrett Rd<br>Patterson, NY 12563 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | GP                                                                                                           | 6/29/2022 |                                                                                                                                              |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | CHK                                                                                                          | DATE      | <div><div></div></div>                                  |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | MS                                                                                                           | 7/1/2022  |                                                                                                                                              |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | ENGR                                                                                                         | DATE      |                                                                                                                                              |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | GP                                                                                                           | 7/1/2022  |                                                                                                                                              |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | MFRGR                                                                                                        | DATE      |                                                                                                                                              |           |           |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | QA                                                                                                           | DATE      | PART                                                                                                                                         | CAGE CODE | DWG NO    | REV                                      |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | RLSE                                                                                                         | DATE      | A                                                                                                                                            | 28812     | 21874-500 |                                          |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                              | THIRD ANGLE PROJECTION  |           | SCALE                                                                                                                                        | 2:1       |           | SHEET 1 OF 1                             |  |  |  |

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