

Surface Mount Directional Coupler

50Ω, 9dB coupling, 5 to 1000 MHz

DBTC-9-4X+



CASE STYLE: AT1667-1

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost

| Reel Size | Devices/Reel |
|-----------|------------------|
| 7" | 20, 50, 100, 200 |
| 13" | 500, 1000, 2000 |

Maximum Ratings

| | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

| | |
|----------------------|---|
| INPUT | 3 |
| OUTPUT | 4 |
| COUPLED | 1 |
| GROUND | 2 |
| ISOLATE (DO NOT USE) | 6 |

Features

- very flat coupling
- very broadband, multi octave
- temperature stable, LTCC base
- all welded construction
- leads attached for better solderability
- micro miniature coupler
- aqueous washable
- protected by US Patents 6,140,887 & 6,784,521

Applications

- VHF/UHF receivers/transmitters
- cellular

Electrical Specifications

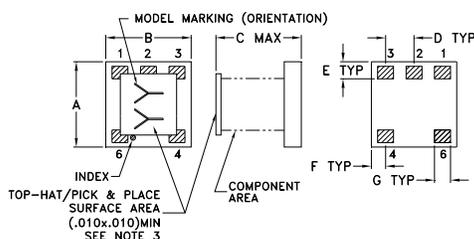
| FREQ. RANGE (MHz) | COUPLING (dB) | MAINLINE LOSS* (dB) | | | | | | DIRECTIVITY (dB) | | | | | | VSWR** (:1) | POWER INPUT (W) | |
|-------------------|---------------|---------------------|------|------|------|------|------|------------------|------|------|------|------|------|-------------|-----------------|------|
| | | Max. | | L | | M | | U | | L | | M | | | U | |
| f_L - f_U | Nom. Flatness | Typ. | Max. | Typ. | Max. | Typ. | Max. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Max. | Max. |
| 5-1000 | 9.0±0.5 | 1.2 | 2.0 | 1.2 | 1.8 | 1.5 | 2.0 | 21 | 17 | 18 | 13 | 15 | — | 1.2 | 0.5 | 1.0 |

L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U]
 * Includes theoretical coupled power loss of 0.58 dB at 9 dB coupling
 ** For coupled port VSWR above 500 MHz, 1.6:1 typ.

Typical Performance Data

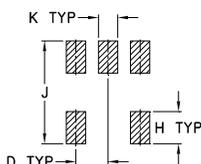
| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 5.00 | 1.18 | 8.93 | 21.62 | 17.90 | 24.67 | 18.40 |
| 10.00 | 1.10 | 8.89 | 21.70 | 19.15 | 29.04 | 19.50 |
| 50.00 | 1.07 | 8.87 | 21.50 | 20.07 | 32.70 | 20.22 |
| 100.00 | 1.09 | 8.90 | 20.99 | 20.12 | 31.81 | 20.27 |
| 300.00 | 1.16 | 8.93 | 19.47 | 20.49 | 30.43 | 18.93 |
| 500.00 | 1.20 | 8.90 | 17.60 | 21.02 | 30.62 | 16.66 |
| 600.00 | 1.23 | 8.88 | 16.50 | 20.89 | 30.39 | 15.36 |
| 800.00 | 1.31 | 8.86 | 14.74 | 20.45 | 30.31 | 12.91 |
| 900.00 | 1.37 | 8.85 | 14.07 | 20.06 | 29.26 | 11.86 |
| 1000.00 | 1.43 | 8.86 | 13.44 | 19.34 | 27.16 | 10.86 |

Outline Drawing



PCB Land Pattern

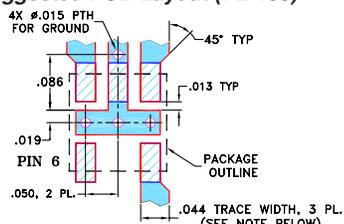
Suggested Layout, Tolerance to be within .002



Outline Dimensions (inch/mm)

| | | | | | |
|------|------|------|------|-------|------|
| A | B | C | D | E | F |
| .150 | .150 | .150 | .050 | .030 | .025 |
| 3.81 | 3.81 | 3.81 | 1.27 | 0.76 | 0.64 |
| G | H | J | K | wt | |
| .028 | .050 | .160 | .030 | grams | |
| 0.71 | 1.27 | 4.06 | 0.76 | 0.10 | |

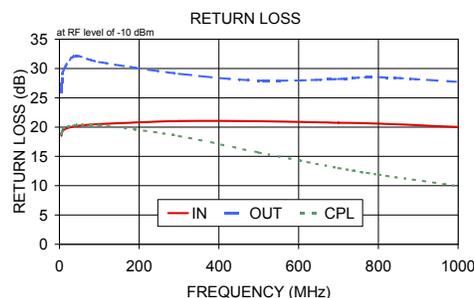
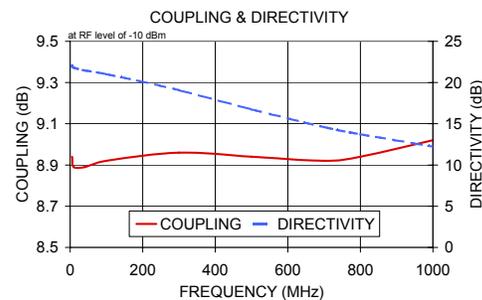
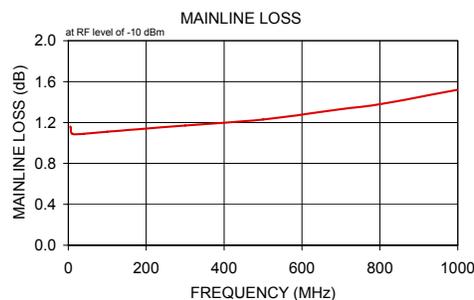
Demo Board MCL P/N: TB-278 Suggested PCB Layout (PL-150)



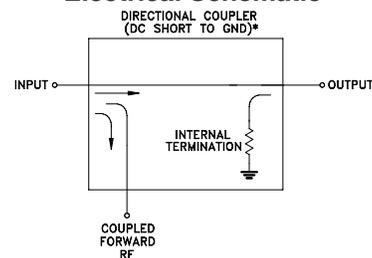
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
-  DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
-  DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

