

Surface Mount Directional Coupler

DBTC-6-4-75L+

75Ω, 6dB coupling, 5 to 1250 MHz

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



Generic photo used for illustration purposes only

CASE STYLE: AT1030

+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, 500 |
| 13" | 1000, 2000 |

Applications

- CATV

Electrical Specifications at 25°C

| Parameter | Condition (MHz) | Min. | Typ. | Max. | Unit |
|----------------------------|-----------------|------|---------|------|------|
| Frequency Range | | 5 | | 1250 | MHz |
| Mainline Loss ¹ | 5-50 | | 2.2 | 3.1 | dB |
| | 50-500 | | 2.2 | 2.6 | |
| | 500-1000 | | 2.3 | 2.8 | |
| | 1000-1250 | | 2.3 | 2.9 | |
| Nominal Coupling | 5-1250 | | 6.8±0.3 | | dB |
| Coupling Flatness(±) | 5-1250 | | | ±0.8 | dB |
| Directivity | 5-50 | 13 | 15 | | dB |
| | 50-500 | 13 | 17 | | |
| | 500-1000 | 10 | 16 | | |
| | 1000-1250 | 7 | 12 | | |
| VSWR ² | 5-1000 | | 1.4 | | dB |
| Input Power | 5-50 | | | 0.5 | W |
| | 50-500 | | | 1.0 | |
| | 500-1000 | | | 1.0 | |
| | 1000-1250 | | | 1.0 | |

1. Includes theoretical coupled power loss of 1.02 dB at 6.8 dB coupling.

2. For coupled port VSWR above 500 MHz, 1.6:1 typ.

Maximum Ratings

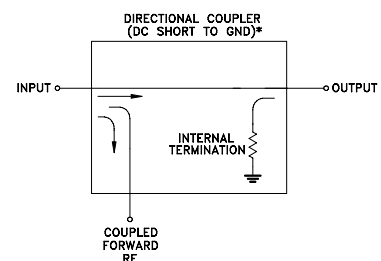
| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

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

Pin Connections

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

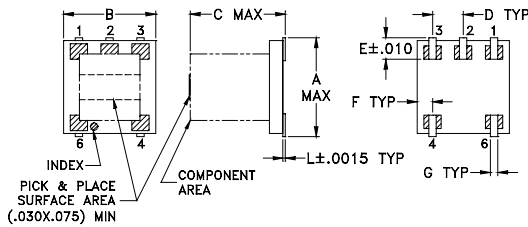
Electrical Schematic



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



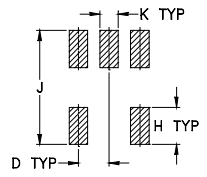
Outline Drawing



Outline Dimensions (inch/mm)

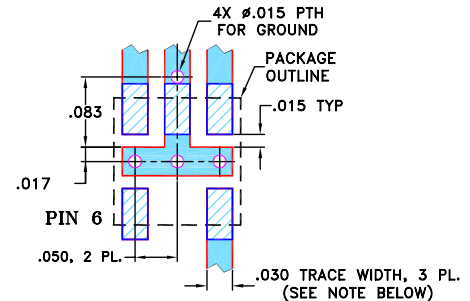
| A | B | C | D | E | F | G | H | J | K | L | wt |
|------|------|------|------|------|------|------|------|------|------|------|-------|
| .166 | .150 | .155 | .050 | .037 | .025 | .012 | .060 | .184 | .030 | .004 | grams |
| 4.22 | 3.81 | 3.94 | 1.27 | 0.94 | 0.64 | 0.30 | 1.52 | 4.67 | 0.76 | 0.10 | 0.10 |

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Demo Board MCL P/N: TB-279
Suggested PCB Layout (PL-151)

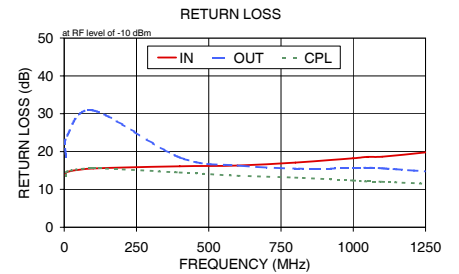
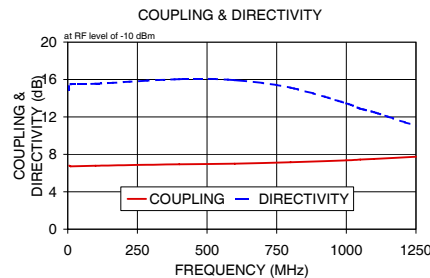
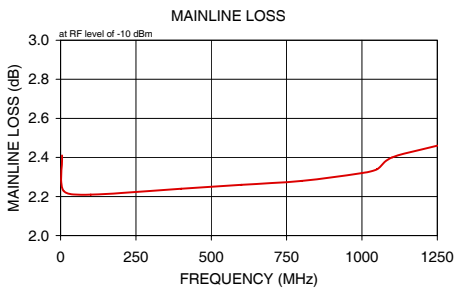


NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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

Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 5.00 | 2.41 | 6.80 | 14.87 | 13.53 | 18.73 | 13.56 |
| 10.00 | 2.23 | 6.72 | 15.49 | 15.49 | 24.15 | 14.72 |
| 100.00 | 2.21 | 6.78 | 15.54 | 15.55 | 30.88 | 15.56 |
| 400.00 | 2.24 | 6.94 | 16.04 | 16.09 | 18.42 | 14.47 |
| 600.00 | 2.26 | 7.01 | 15.94 | 16.09 | 16.33 | 13.60 |
| 800.00 | 2.28 | 7.16 | 15.12 | 17.08 | 15.48 | 13.11 |
| 1000.00 | 2.32 | 7.36 | 13.45 | 18.22 | 15.61 | 12.36 |
| 1050.00 | 2.34 | 7.44 | 12.88 | 18.62 | 15.75 | 12.10 |
| 1100.00 | 2.40 | 7.51 | 12.50 | 18.66 | 15.58 | 12.04 |
| 1250.00 | 2.46 | 7.75 | 11.03 | 19.78 | 14.75 | 11.49 |



Additional 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-Circuits' 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