

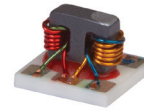
Surface Mount Directional Coupler

DBTC-13-4+

50Ω, 13dB coupling, 5 to 1000 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: AT790-1

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

Applications

- VHF/UHF receivers/transmitters
- cellular

Electrical Specifications at 25°C

| Parameter | Condition (MHz) | Min. | Typ. | Max. | Unit |
|----------------------------|-----------------|------|----------|------|------|
| Frequency Range | | 5 | | 1000 | MHz |
| Mainline Loss ¹ | 5-50 | | 0.7 | 1.3 | dB |
| | 50-500 | | 0.7 | 1.3 | |
| | 500-1000 | | 1.1 | 1.6 | |
| Nominal Coupling | 5-1000 | | 13.0±0.5 | | dB |
| Coupling Flatness(±) | 5-1000 | | | ±0.6 | dB |
| Directivity | 5-50 | 17 | 21 | | dB |
| | 50-500 | 13 | 18 | | |
| | 500-1000 | — | 13 | | |
| VSWR ² | 5-1000 | | 1.2 | | dB |
| Input Power | 5-50 | | | 0.5 | W |
| | 50-500 | | | 1.0 | |
| | 500-1000 | | | 1.0 | |

1. Includes theoretical coupled power loss of 0.22 dB at 13 dB coupling.

2. For coupled port VSWR above 500 MHz, 1.4:1 typ.

Maximum Ratings

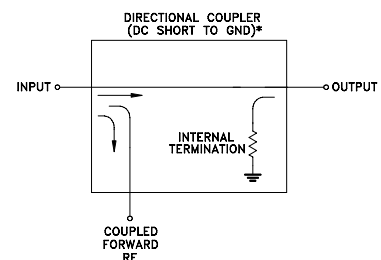
| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

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 |

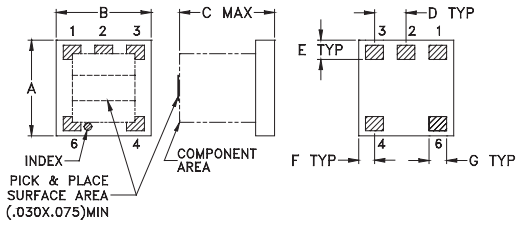
Electrical Schematic



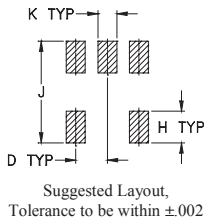
* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.



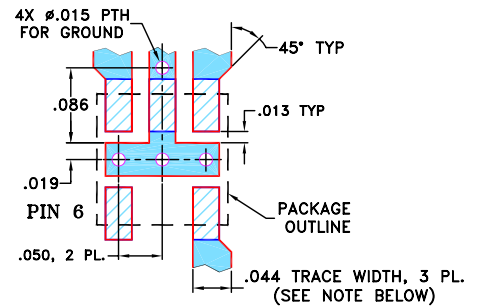
Outline Drawing



PCB Land Pattern



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



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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.

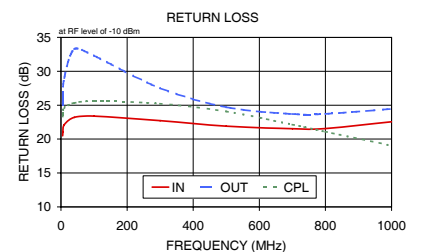
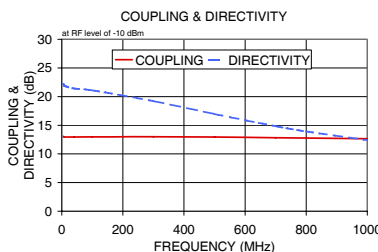
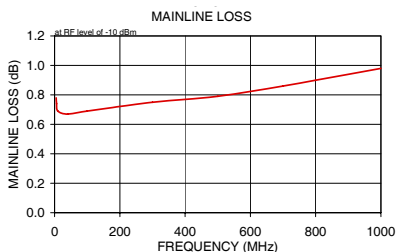
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Outline Dimensions (inch/mm)

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

Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 5.00 | 0.77 | 13.08 | 22.34 | 19.78 | 23.72 | 22.27 |
| 10.00 | 0.70 | 13.00 | 21.94 | 21.65 | 27.70 | 23.92 |
| 50.00 | 0.65 | 12.95 | 21.49 | 23.18 | 32.43 | 25.26 |
| 100.00 | 0.67 | 12.98 | 21.06 | 23.12 | 31.88 | 25.46 |
| 300.00 | 0.74 | 13.04 | 19.82 | 22.41 | 26.20 | 24.99 |
| 500.00 | 0.79 | 13.05 | 18.10 | 21.80 | 23.68 | 24.06 |
| 600.00 | 0.82 | 13.03 | 16.98 | 21.37 | 22.90 | 23.20 |
| 800.00 | 0.89 | 13.01 | 15.16 | 21.11 | 22.22 | 21.19 |
| 900.00 | 0.93 | 12.99 | 14.48 | 21.34 | 22.35 | 20.16 |
| 1000.00 | 0.98 | 12.97 | 13.82 | 21.62 | 22.42 | 19.03 |



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.
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