

Surface Mount ^{top hat} Directional Coupler

TCD-13-4-75X+

75Ω 5 to 1000 MHz

Features

- wideband, 5 to 1000 MHz
- low mainline loss, 0.8 dB typ.
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

Applications

- VHF/UHF
- CATV
- cellular



Generic photo used for illustration purposes only

CASE STYLE: DB1627

+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 |

Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|----------------------------|-----------------|------|--------|------|------|
| Frequency Range | | 5 | | 1000 | MHz |
| Mainline Loss ¹ | 5 - 50 | — | 1.0 | 1.8 | dB |
| | 50 - 500 | — | 0.8 | 1.3 | |
| | 500 - 1000 | — | 1.1 | 1.5 | |
| Nominal Coupling | | — | 13±0.5 | — | dB |
| Coupling Flatness(±) | | — | ±0.9 | — | dB |
| Directivity | 5 - 50 | 17 | 22 | — | dB |
| | 50 - 500 | — | 15 | — | |
| | 500 - 1000 | — | 12 | — | |
| VSWR | 10 - 750 | | 1.2 | | :1 |
| Input Power | 5 - 50 | — | — | 0.5 | W |
| | 50 - 1000 | — | — | 1.0 | |

1. Mainline loss includes theoretical power loss at coupled port.

Maximum Ratings

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

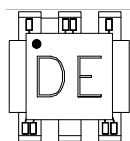
Permanent damage may occur if any of these limits are exceeded.

* Case temperature is defined as temperature on ground leads.

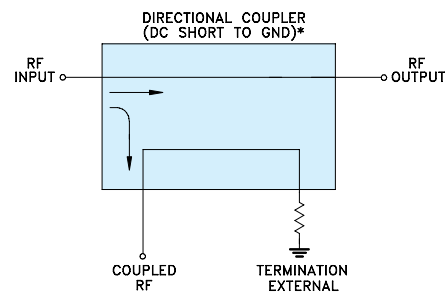
Pin Connections

| Function | Pin Number |
|-------------------|------------|
| INPUT | 3 |
| OUTPUT | 4 |
| COUPLED | 1 |
| GROUND | 2 |
| 75Ω TERM EXTERNAL | 6 |
| NOT USED | 5 |

Product Marking

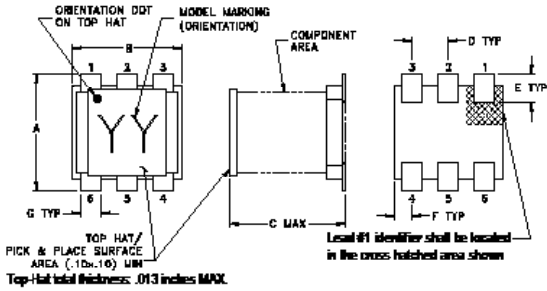


Electrical Schematic

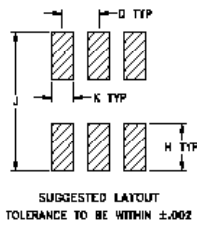


* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.

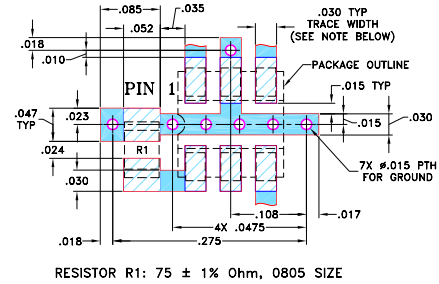
Outline Drawing



PCB Land Pattern



Demo Board MCL P/N: TB-72
Suggested PCB Layout (PL-010)



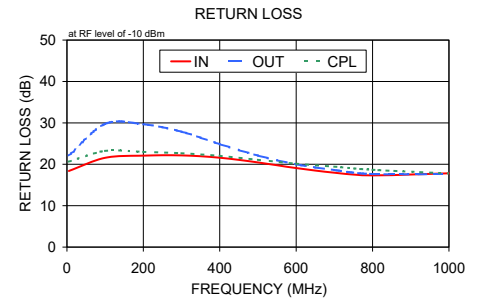
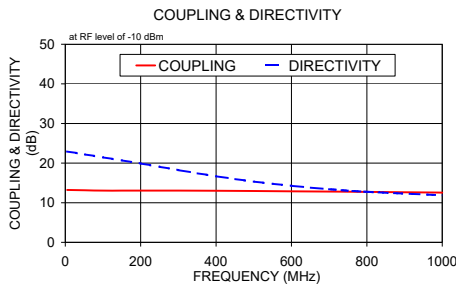
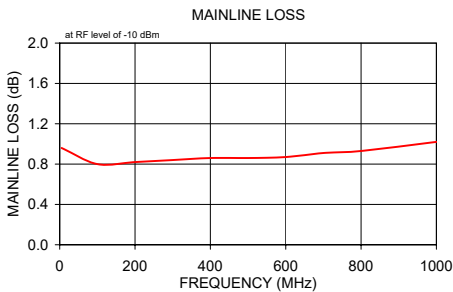
- NOTES:**
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $0.030" \pm 0.002"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Outline Dimensions (inch/mm)

| A | B | C | D | E | F |
|------|------|------|------|-------|------|
| .160 | .150 | .160 | .050 | .040 | .025 |
| 4.06 | 3.81 | 4.06 | 1.27 | 1.02 | 0.64 |
| G | H | J | K | wt | |
| .028 | .065 | .190 | .030 | grams | |
| 0.71 | 1.65 | 4.83 | 0.76 | 0.15 | |

Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 5.00 | 0.96 | 13.23 | 22.93 | 18.39 | 22.11 | 20.63 |
| 100.00 | 0.80 | 13.07 | 21.46 | 21.56 | 29.75 | 23.23 |
| 200.00 | 0.82 | 13.07 | 19.90 | 22.09 | 29.67 | 22.99 |
| 300.00 | 0.84 | 13.06 | 18.25 | 22.15 | 27.88 | 22.67 |
| 400.00 | 0.86 | 13.03 | 16.68 | 21.58 | 24.86 | 22.04 |
| 500.00 | 0.86 | 12.96 | 15.34 | 20.44 | 22.11 | 21.08 |
| 600.00 | 0.87 | 12.88 | 14.27 | 19.08 | 19.99 | 20.15 |
| 700.00 | 0.91 | 12.82 | 13.42 | 17.97 | 18.61 | 19.42 |
| 800.00 | 0.93 | 12.73 | 12.75 | 17.33 | 17.64 | 18.67 |
| 1000.00 | 1.02 | 12.56 | 11.88 | 17.83 | 17.63 | 17.78 |



Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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