

Surface Mount Directional Coupler

TCD-10-4-75X+

75Ω

5 to 1000 MHz

Features

- wideband, 5-1000 MHz
- excellent flatness, ±0.1 dB typ.
- better performance than MA-COM EMDC-10-1-75
- footprint compatible to EMDC-10-1-75
- aqueous washable

Applications

- CATV



Generic photo used for illustration purposes only

CASE STYLE: AT1521

+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 | Condition (MHz) | Min. | Typ. | Max. | Unit |
|---|-----------------|------|---------|------|------|
| Frequency Range | | 5 | | 1000 | MHz |
| Mainline Loss ¹ (above theoretical 0.1 dB) | 5-50 | — | 1.0 | 1.5 | dB |
| | 5-500 | — | 1.1 | 1.5 | |
| | 500-1000 | — | 1.3 | 1.9 | |
| Nominal Coupling | 5-1000 | | 9.9±0.5 | | dB |
| Coupling Flatness(±) | 5-1000 | | ±0.3 | | dB |
| Directivity | 5-50 | 19 | 22 | — | dB |
| | 5-500 | 13 | 20 | — | |
| | 500-1000 | 11 | 15 | — | |
| Return Loss (Input) | 5-1000 | — | 19.08 | — | dB |
| Return Loss (Output) | 5-1000 | — | 19.08 | — | dB |
| Return Loss (Coupling) | 5-1000 | — | 19.08 | — | dB |
| Input Power | 5-1000 | — | — | 1.0 | W |

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 |

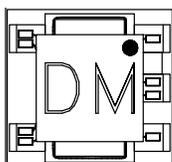
Permanent damage may occur if any of these limits are exceeded.

* Case temperature is defined as temperature on ground leads.

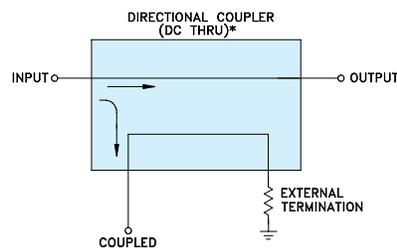
Pin Connections

| Function | Pin Number |
|-------------------|------------|
| INPUT | 3 |
| OUTPUT | 4 |
| COUPLED | 1 |
| GROUND | 2 |
| 75Ω TERM EXTERNAL | 6 |

Product Marking

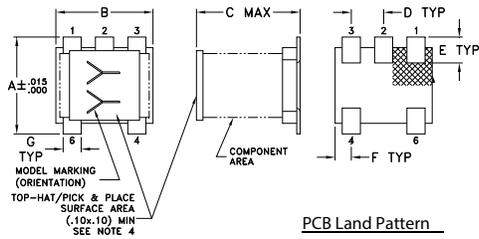


Electrical Schematic



* ELECTRICAL SCHEMATIC FOR DIRECTIONAL COUPLERS REQUIRING EXTERNAL TERMINATION THAT IS DESIGNED WITHOUT INTERNAL TRANSFORMERS.

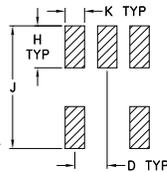
Outline Drawing



Note:

1. Case Material Plastic
2. Termination Finish: Tin plate over Nickel plate.
3. Lead #1 identifier shall be located in the cross-hatched area shown, on bottom view. Identifier may be either a molded or marked feature.
4. Top-Hat total thickness: 0.13 inches max.

PCB Land Pattern

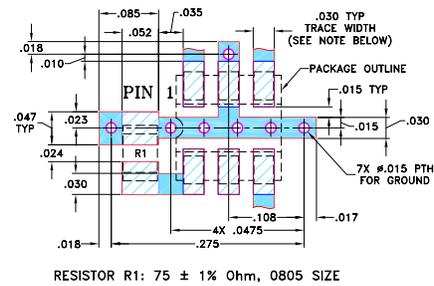


Suggested Layout, Tolerance to be within ±.002

Outline Dimensions (inch/mm)

| A | B | C | D | E | F | |
|------|------|------|------|------|------|-------|
| .150 | .150 | .160 | .050 | .040 | .025 | |
| 3.81 | 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 |

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

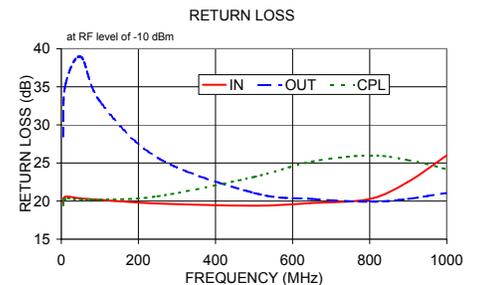
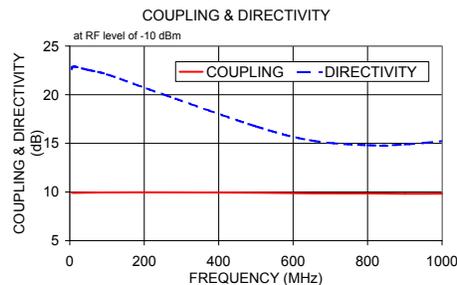
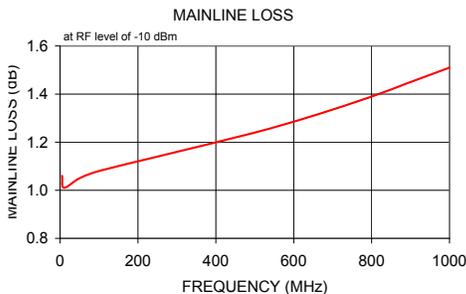


- NOTES:**
1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $0.030" \pm 0.002"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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 | 1.06 | 9.94 | 22.66 | 19.73 | 28.50 | 19.46 |
| 10.00 | 1.01 | 9.90 | 22.91 | 20.57 | 35.13 | 20.26 |
| 50.00 | 1.05 | 9.93 | 22.54 | 20.35 | 38.95 | 20.20 |
| 100.00 | 1.08 | 9.95 | 22.09 | 20.17 | 33.10 | 20.18 |
| 250.00 | 1.14 | 9.96 | 20.05 | 19.68 | 25.68 | 20.63 |
| 500.00 | 1.24 | 9.92 | 16.74 | 19.39 | 21.07 | 23.17 |
| 650.00 | 1.31 | 9.86 | 15.28 | 19.74 | 20.28 | 25.18 |
| 800.00 | 1.39 | 9.85 | 14.81 | 20.28 | 19.92 | 25.99 |
| 900.00 | 1.45 | 9.82 | 14.88 | 22.54 | 20.29 | 25.37 |
| 1000.00 | 1.51 | 9.83 | 15.23 | 26.00 | 21.07 | 24.19 |



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.
- 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