

# Surface Mount Directional Coupler

50Ω 10 to 750 MHz

## TCD-10-1W+

### Features

- wideband, 10 to 750 MHz
- low mainline loss, 1.2 dB typ.
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

### Applications

- VHF/UHF
- signal sampling
- communications



Generic photo used for illustration purposes only

CASE STYLE: DB714

**+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

| Parameter                  | Frequency (MHz) | Min. | Typ.     | Max. | Unit |
|----------------------------|-----------------|------|----------|------|------|
| Frequency Range            |                 | 10   |          | 750  | MHz  |
| Mainline Loss <sup>1</sup> | 10 - 100        | —    | 1.3      | 2.1  | dB   |
|                            | 100 - 350       | —    | 1.2      | 1.6  |      |
|                            | 350 - 750       | —    | 1.4      | 2.0  |      |
| Nominal Coupling           |                 | —    | 10.3±0.5 | —    | dB   |
| Coupling Flatness(±)       |                 | —    | ±0.8     | —    | dB   |
| Directivity                | 10 - 100        | 17   | 22       | —    | dB   |
|                            | 100 - 350       | 14   | 18       | —    |      |
|                            | 350 - 750       | —    | 15       | —    |      |
| VSWR                       | 10 - 750        |      | 1.3      |      | :1   |
| Input Power                | 10 - 100        | —    | —        | 0.5  | W    |
|                            | 100 - 750       | —    | —        | 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 |

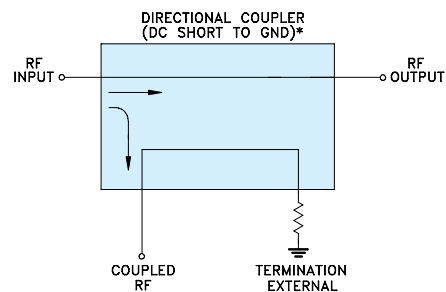
Permanent damage may occur if any of these limits are exceeded.

\* Case temperature is defined as temperature on ground leads.

### Pin Connections

| Function          | Pin Number |
|-------------------|------------|
| INPUT             | 3          |
| OUTPUT            | 4          |
| COUPLED           | 1          |
| GROUND            | 2          |
| 50Ω TERM EXTERNAL | 6          |
| NOT USED          | 5          |

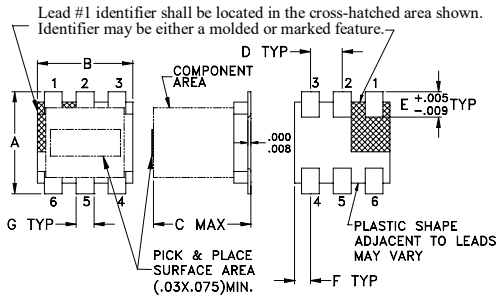
### Electrical Schematic



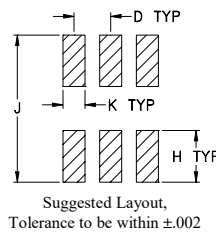
\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.



## Outline Drawing



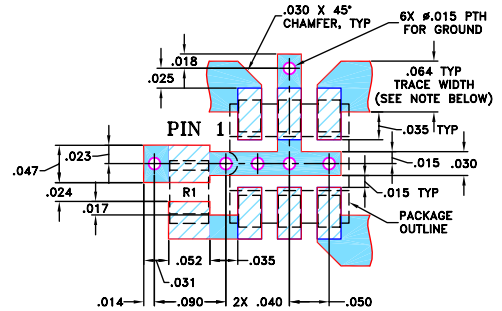
## PCB Land Pattern



## 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  |      |

## Demo Board MCL P/N: TB-71 Suggested PCB Layout (PL-009)



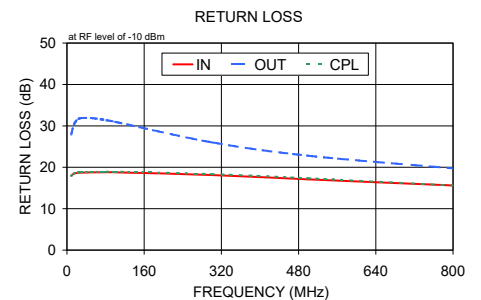
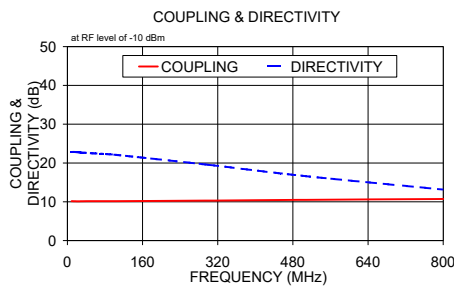
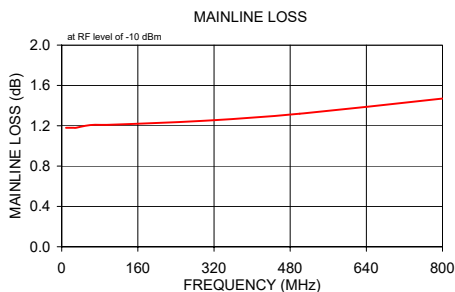
**NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $0.030" \pm 0.002"$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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)<br>In-Out | Coupling (dB)<br>In-Cpl | Directivity (dB) | In    | Return Loss (dB)<br>Out | Cpl   |
|-----------------|------------------------------|-------------------------|------------------|-------|-------------------------|-------|
| 9.00            | 1.18                         | 10.17                   | 22.87            | 17.95 | 27.94                   | 17.96 |
| 15.00           | 1.18                         | 10.14                   | 22.85            | 18.48 | 30.46                   | 18.53 |
| 24.00           | 1.18                         | 10.13                   | 22.75            | 18.67 | 31.68                   | 18.74 |
| 30.00           | 1.18                         | 10.14                   | 22.68            | 18.71 | 31.90                   | 18.79 |
| 50.00           | 1.20                         | 10.16                   | 22.53            | 18.77 | 31.89                   | 18.87 |
| 70.00           | 1.21                         | 10.16                   | 22.38            | 18.78 | 31.59                   | 18.90 |
| 100.00          | 1.21                         | 10.17                   | 22.13            | 18.78 | 30.97                   | 18.93 |
| 300.00          | 1.25                         | 10.31                   | 19.54            | 18.13 | 26.04                   | 18.34 |
| 500.00          | 1.32                         | 10.49                   | 16.70            | 17.08 | 22.79                   | 17.34 |
| 800.00          | 1.47                         | 10.73                   | 13.13            | 15.61 | 19.73                   | 15.58 |



## 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](http://www.minicircuits.com/MCLStore/terms.jsp)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mini-Circuits:](#)

[TCD-10-1W+](#)