

# Surface Mount Directional Coupler

## TCD-18-4-75+

75Ω

10 to 1000 MHz

### Features

- wideband, 10 to 1000 MHz
- low mainline loss, 0.7 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: 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   |          | 1000 | MHz  |
| Mainline Loss <sup>1</sup> | 10 - 100        | —    | 0.9      | 1.3  | dB   |
|                            | 100 - 500       | —    | 0.7      | 1.2  |      |
|                            | 500 - 1000      | —    | 0.8      | 1.3  |      |
| Nominal Coupling           | 10 - 1000       | —    | 18.0±0.5 | —    | dB   |
| Coupling Flatness(±)       | 10 - 1000       | —    | ±0.9     | —    | dB   |
| Directivity                | 10 - 100        | 15   | 20       | —    | dB   |
|                            | 100 - 500       | 15   | 22       | —    |      |
|                            | 500 - 1000      | —    | 18       | —    |      |
| VSWR                       | 10 - 1000       | —    | 1.20     | —    | :1   |
| Input Power                | 10 - 100        | —    | —        | 1.0  | W    |
|                            | 100 - 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 |

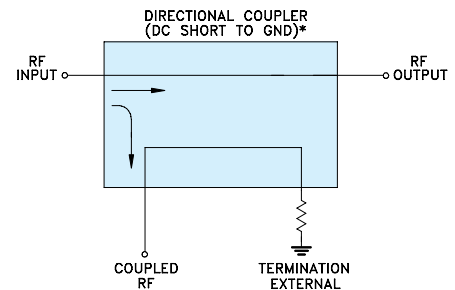
Permanent damage may occur if any of these limits are exceeded.

\* 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          |

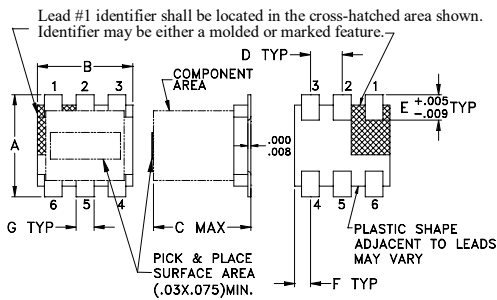
### Electrical Schematic



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



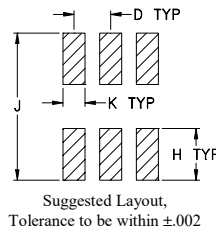
## Outline Drawing



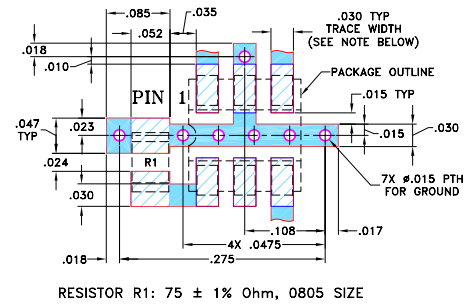
## Outline Dimensions (inch/mm)

| 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  |      |

## PCB Land Pattern



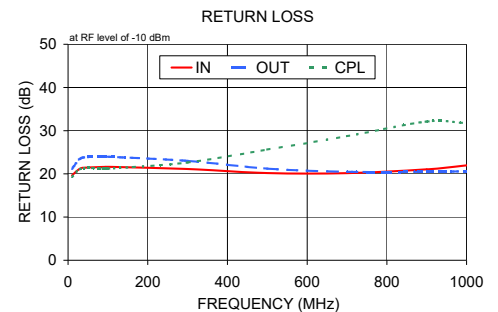
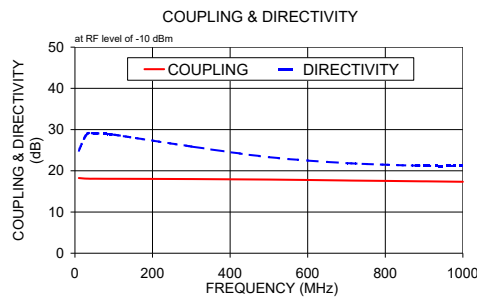
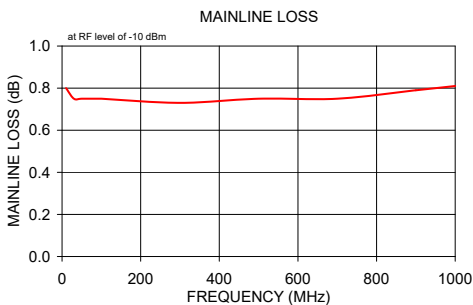
## Demo Board MCL P/N: TB-72 Suggested PCB Layout (PL-010)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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   |
| 10.00           | 0.80                      | 18.25                | 24.89            | 19.65            | 21.19 | 19.31 |
| 30.00           | 0.75                      | 18.09                | 28.81            | 21.21            | 23.47 | 21.05 |
| 50.00           | 0.75                      | 18.07                | 29.10            | 21.46            | 23.88 | 21.36 |
| 90.00           | 0.75                      | 18.05                | 28.90            | 21.60            | 23.98 | 21.20 |
| 100.00          | 0.75                      | 18.05                | 28.77            | 21.62            | 23.96 | 21.20 |
| 300.00          | 0.73                      | 18.00                | 25.91            | 21.12            | 23.00 | 22.63 |
| 500.00          | 0.75                      | 17.87                | 23.32            | 20.19            | 21.20 | 25.64 |
| 700.00          | 0.75                      | 17.64                | 21.87            | 20.17            | 20.48 | 28.73 |
| 900.00          | 0.79                      | 17.44                | 21.22            | 21.04            | 20.47 | 32.11 |
| 1000.00         | 0.81                      | 17.34                | 21.19            | 21.96            | 20.60 | 31.73 |



## 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-Circuit's 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](http://www.minicircuits.com/MCLStore/terms.jsp)