



# THE DATASHEET OF DBTC-17-5+



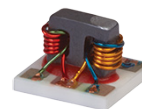
# Surface Mount Directional Coupler

## DBTC-17-5+

50Ω, 17dB coupling, 50 to 2000 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

- cellular
- PCS
- DECT/PHS
- GSM

### Electrical Specifications at 25°C

| Parameter                  | Condition (MHz) | Min. | Typ.     | Max. | Unit |
|----------------------------|-----------------|------|----------|------|------|
| Frequency Range            |                 | 5    |          | 1500 | MHz  |
| Mainline Loss <sup>1</sup> | 50-1000         |      | 0.9      | 1.4  | dB   |
|                            | 1000-1500       |      | 1.0      | 1.5  |      |
|                            | 1500-2000       |      | 1.1      | 1.6  |      |
| Nominal Coupling           | 50-1000         |      | 17.0±0.7 |      | dB   |
|                            | 1000-1500       |      | 17.2±0.9 |      |      |
|                            | 1500-2000       |      | 17.0±1.0 |      |      |
| Coupling Flatness(±)       | 50-1000         |      |          | ±0.9 | dB   |
|                            | 1000-1500       |      |          | ±1.0 |      |
|                            | 1500-2000       |      |          | ±0.8 |      |
| Directivity                | 50-1000         | 13   | 20       |      | dB   |
|                            | 1000-1500       | 10   | 20       |      |      |
|                            | 1500-2000       | —    | 14       |      |      |
| VSWR <sup>2</sup>          | 50-1000         |      | 1.2      |      | dB   |
|                            | 1000-1500       |      | 1.2      |      |      |
|                            | 1500-2000       |      | 1.2      |      |      |
| Input Power                | 50-1000         |      |          | 2.0  | W    |
|                            | 1000-1500       |      |          | 2.0  |      |
|                            | 1500-2000       |      |          | 2.0  |      |

1. Includes theoretical coupled power loss of 0.07 dB at 17 dB coupling.

2. For coupled port VSWR above 500 MHz, 1.6:1 typ.

### Maximum Ratings

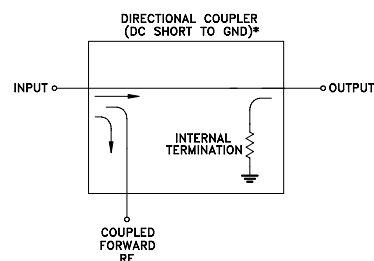
| Parameter             | Ratings        |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

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          |

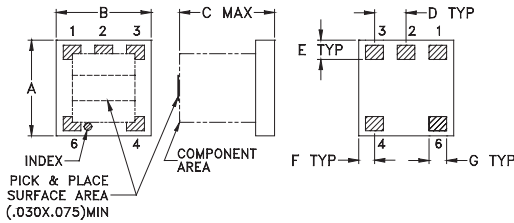
### Electrical Schematic



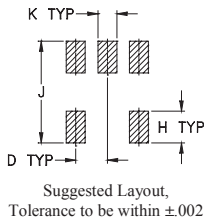
\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.



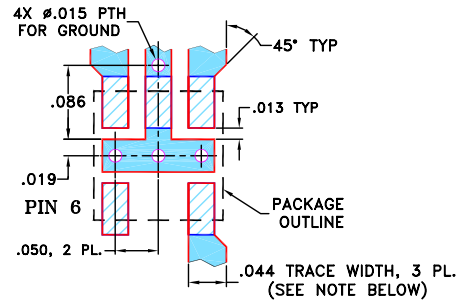
## Outline Drawing



## 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  $0.020 \pm 0.0015$ ”; 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.

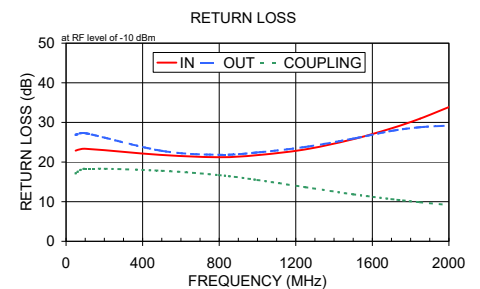
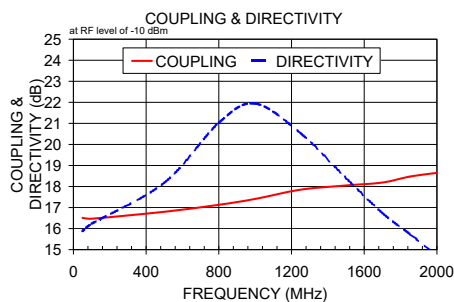
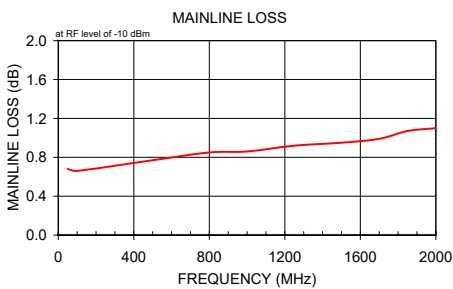
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## 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   |
| 50.00           | 0.64                      | 16.41                | 15.92            | 23.43            | 27.62 | 18.46 |
| 100.00          | 0.66                      | 16.42                | 16.17            | 23.56            | 27.75 | 18.62 |
| 500.00          | 0.76                      | 16.74                | 18.53            | 22.36            | 23.13 | 18.78 |
| 800.00          | 0.85                      | 17.06                | 22.42            | 21.45            | 21.80 | 18.22 |
| 1000.00         | 0.91                      | 17.30                | 22.32            | 21.67            | 21.94 | 17.08 |
| 1300.00         | 0.99                      | 17.63                | 17.74            | 22.81            | 22.71 | 14.85 |
| 1500.00         | 1.05                      | 17.81                | 15.41            | 24.84            | 24.12 | 13.40 |
| 1600.00         | 1.08                      | 17.88                | 14.43            | 25.91            | 24.48 | 12.71 |
| 1900.00         | 1.18                      | 18.07                | 12.20            | 28.04            | 25.71 | 10.95 |
| 2000.00         | 1.21                      | 18.11                | 11.55            | 28.07            | 25.97 | 10.50 |



## 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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