

# Directional Couplers

DBTC-13-5-75+ DBTC-13-5-75L+

75Ω, 13dB coupling, 5 to 1500 MHz



No Leads

CASE STYLE:AT790-1  
PRICE:\$1.99 ea. QTY (25)  
\$1.69 ea. QTY (1000)



Leads

CASE STYLE:AT1030  
PRICE:\$2.14 ea. QTY (25)  
\$1.84 ea. QTY (1000)

## Maximum 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

|                      |   |
|----------------------|---|
| INPUT                | 3 |
| OUTPUT               | 4 |
| COUPLED              | 1 |
| GROUND               | 2 |
| ISOLATE (DO NOT USE) | 6 |

## 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

## Applications

- VHF/UHF receivers/transmitters
- cellular

## Electrical Specifications

| FREQ. RANGE (MHz) | COUPLING (dB) |          | MAINLINE LOSS* (dB) |     |     |     | DIRECTIVITY (dB) |     |      | VSWR** (:1) | POWER INPUT (W) |    |    |   |     |     |     |
|-------------------|---------------|----------|---------------------|-----|-----|-----|------------------|-----|------|-------------|-----------------|----|----|---|-----|-----|-----|
|                   | Nom.          | Flatness | L                   | M   | U   | L   | M                | U   | Typ. |             | L               | MU |    |   |     |     |     |
| 5-1000            | 13.2±0.5      | ±0.6     | 0.9                 | 1.4 | 1.0 | 1.5 | 1.1              | 1.6 | 21   | 17          | 19              | 14 | 18 | — | 1.3 | 0.5 | 1.0 |
| 1000-1500         | 13.6±0.5      | ±0.8     | —                   | —   | 1.4 | 2.2 | —                | —   | —    | —           | —               | —  | —  | — | 1.3 | —   | 1.0 |

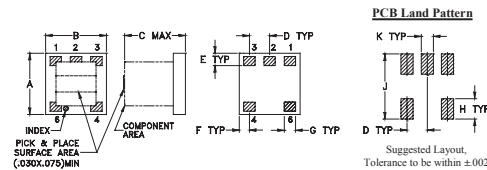
L = 5-50 MHz, M=50-500 MHz, U=500-1000 MHz apply to upper row of specs. 2nd row is for 1000-1500 MHz.

\* Includes theoretical coupled power loss of 0.21 dB at 13 dB coupling

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

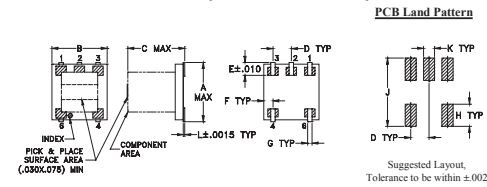
## Outline Drawing / Dimensions (inch mm)

### AT790-1 (DBTC-13-5-75)



|      |      |      |      |      |      |      |      |      |      |       |
|------|------|------|------|------|------|------|------|------|------|-------|
| 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  |

### AT1030 (DBTC-13-5-75L)

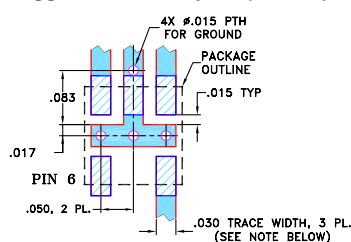


|      |      |      |      |      |      |      |      |      |      |      |       |
|------|------|------|------|------|------|------|------|------|------|------|-------|
| A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L    | wt    |
| .166 | .150 | .155 | .050 | .037 | .025 | .012 | .060 | .184 | .030 | .004 | grams |
| 4.22 | 3.81 | 3.94 | 1.27 | 0.94 | 0.64 | 0.30 | 1.52 | 4.67 | 0.76 | 0.10 | 0.10  |

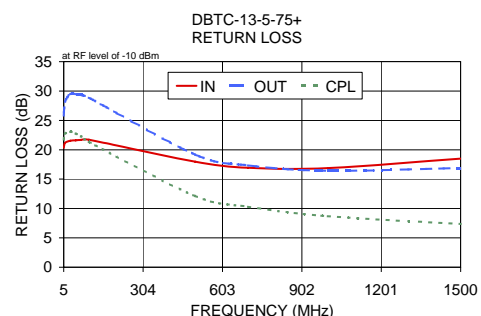
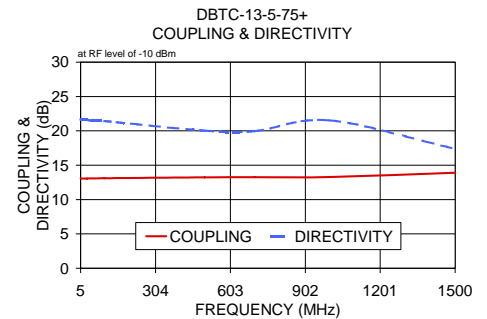
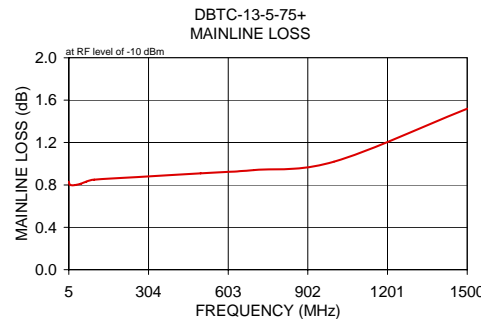
## Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |       |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
|                 |                           |                      |                  | In               | Out   | Cpl   |
| 5.00            | 0.83                      | 13.09                | 21.69            | 20.33            | 25.83 | 21.73 |
| 10.00           | 0.80                      | 13.06                | 21.61            | 21.17            | 28.18 | 22.73 |
| 30.00           | 0.80                      | 13.06                | 21.61            | 21.55            | 29.45 | 23.06 |
| 50.00           | 0.81                      | 13.07                | 21.48            | 21.61            | 29.48 | 22.74 |
| 70.00           | 0.83                      | 13.09                | 21.51            | 21.69            | 29.33 | 22.26 |
| 100.00          | 0.85                      | 13.11                | 21.42            | 21.72            | 28.86 | 21.33 |
| 500.00          | 0.91                      | 13.23                | 20.04            | 17.98            | 19.17 | 12.15 |
| 700.00          | 0.94                      | 13.26                | 19.95            | 16.94            | 17.35 | 10.31 |
| 1000.00         | 1.02                      | 13.29                | 21.53            | 16.89            | 16.41 | 8.68  |
| 1500.00         | 1.52                      | 13.90                | 17.38            | 18.50            | 16.87 | 7.37  |

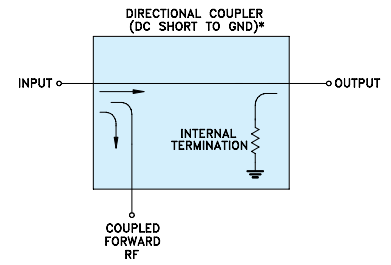
## Demo Board MCL P/N: TB-279 Suggested PCB Layout (PL-151)



- 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)
3. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK



## Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMERS THAT ROUTES DC FROM RF PORTS TO GROUND.

For detailed performance specs & shopping online see web site

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