

# Surface Mount Directional Couplers

50Ω

5 to 1000 MHz

## Maximum Ratings

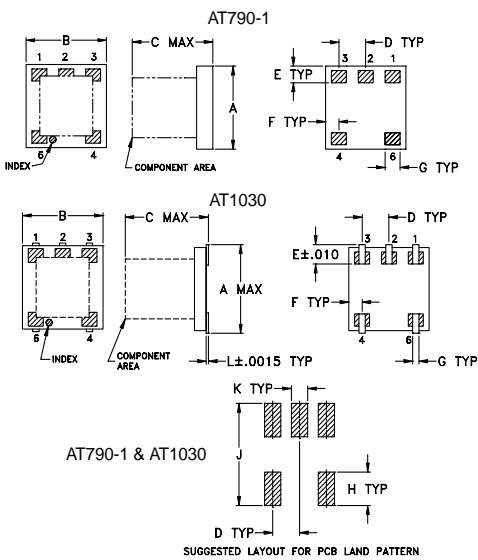
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

## Pin Connections

|           |     |
|-----------|-----|
| INPUT     | 3   |
| OUTPUT    | 4   |
| COUPLED   | 1   |
| GROUND    | 2   |
| NOT USED* | 5,6 |

\*pins 5&6 must be isolated

## Outline Drawing



## Outline Dimensions (inch/mm)

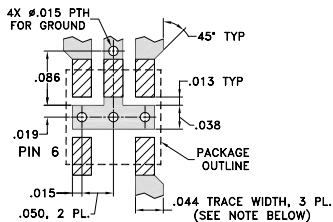
| AT790-1 | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | wt.   |
|---------|------|------|------|------|------|------|------|------|------|------|-------|
|         | .150 | .150 | .150 | .050 | .030 | .025 | .028 | .050 | .160 | .030 | grams |
|         | 3.81 | 3.81 | 3.81 | 1.27 | 0.76 | 0.64 | 0.71 | 1.27 | 4.06 | 0.76 | .10   |

| AT1030 | 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 | .10   |

## Reflow Solder Assembly

Silver-bearing solder (Sn/Pb/Ag 62/36/2%) is recommended; however, tin-lead eutectic (Sn/Pb 63/37%) may be used. For temperature profiles, see Application Note AN-40-004

## Demo Board MCL P/N: TB-278 Suggested PCB Layout (PL-150)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS 0.020" ± 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
- ▨ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Features

- very flat coupling
- very broadband, multi octave
- temperature stable, BLUE CELL™ base
- all welded construction
- leads attached for better solderability
- micro-miniature coupler
- protected by U.S. Patent 6,140,887 & 6,784,521

## Applications

- VHF/UHF receivers/transmitters
- cellular

**NEW!**  
DBTC-12-4 DBTC-12-4L



No Leads

BLUE CELL™



Leads

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

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

## Directional Coupler Electrical Specifications

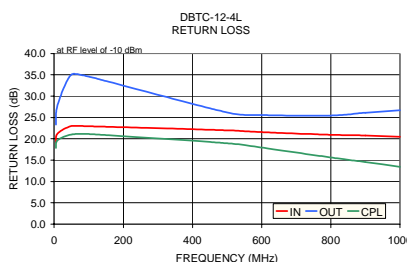
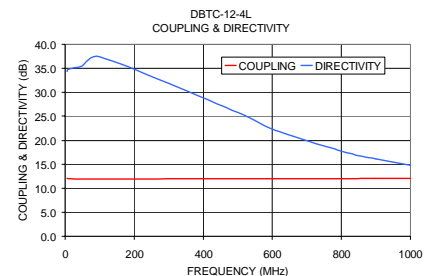
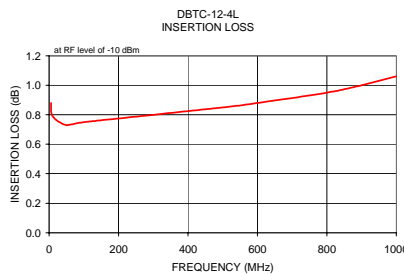
| FREQ. RANGE (MHz) | COUPLING (dB) |               | MAINLINE LOSS* (dB) |        |        | DIRECTIVITY (dB) |             |             | VSWR** (:1) | POWER INPUT, W |         |    |    |   |      |     |     |
|-------------------|---------------|---------------|---------------------|--------|--------|------------------|-------------|-------------|-------------|----------------|---------|----|----|---|------|-----|-----|
|                   | Nom.          | Max. Flatness | L Typ.              | M Typ. | U Typ. | L Typ. Min.      | M Typ. Min. | U Typ. Min. |             | L Max.         | MU Max. |    |    |   |      |     |     |
| $f_L$ - $f_U$     |               |               |                     |        |        |                  |             |             |             |                |         |    |    |   |      |     |     |
| 5-1000            | 12.2±0.5      | ±0.9          | 0.9                 | 1.8    | 0.7    | 1.3              | 1.1         | 1.6         | 33          | 22             | 21      | 14 | 15 | — | 1.20 | 0.5 | 1.0 |

\* Includes theoretical coupled power loss of 0.27 dB at 12 dB coupling. L = low range [ $f_L$  to 10  $f_L$ ] M = mid range [10  $f_L$  to  $f_U/2$ ] U = upper range [ $f_U/2$  to  $f_U$ ]  
\*\* For coupled port VSWR above 500 MHz, 1.5:1 typ.

## Typical Performance Data

| Frequency (MHz) | Insertion Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |       |
|-----------------|----------------------------|----------------------|------------------|------------------|-------|-------|
|                 |                            |                      |                  | In               | Out   | Cpl   |
| 5.00            | 0.88                       | 12.07                | 34.34            | 19.19            | 23.31 | 17.81 |
| 10.00           | 0.79                       | 11.96                | 34.86            | 21.25            | 27.96 | 19.68 |
| 50.00           | 0.73                       | 11.90                | 35.53            | 22.99            | 35.09 | 21.01 |
| 100.00          | 0.75                       | 11.93                | 37.41            | 22.94            | 34.58 | 21.11 |
| 500.00          | 0.85                       | 11.99                | 25.82            | 22.00            | 26.19 | 18.96 |
| 600.00          | 0.88                       | 11.99                | 22.32            | 21.56            | 25.58 | 17.94 |
| 800.00          | 0.95                       | 12.03                | 17.75            | 20.94            | 25.46 | 15.62 |
| 900.00          | 1.00                       | 12.07                | 16.15            | 20.79            | 26.14 | 14.55 |
| 1000.00         | 1.06                       | 12.13                | 14.74            | 20.48            | 26.70 | 13.43 |

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