

# Directional Couplers

75Ω, 20dB coupling, 5 to 1250 MHz

## Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

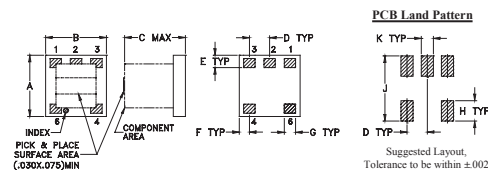
Permanent damage may occur if any of these limits are exceeded.

## Pin Connections

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

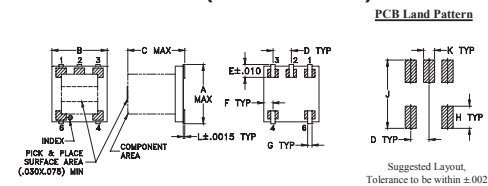
## Outline Drawing / Dimensions (inch mm)

### AT790-1 (DBTC-20-4-75)



| Dimension | Value (inch) | Value (mm) | Weight (grams) |
|-----------|--------------|------------|----------------|
| A         | .150         | 3.81       | 3.81           |
| B         | .150         | 3.81       | 3.81           |
| C         | .150         | 3.81       | 3.81           |
| D         | .050         | 1.27       | 1.27           |
| E         | .030         | 0.76       | 0.76           |
| F         | .025         | 0.64       | 0.64           |
| G         | .028         | 0.71       | 0.71           |
| H         | .050         | 1.27       | 1.27           |
| J         | .160         | 4.06       | 4.06           |
| K         | .030         | 0.76       | 0.76           |
| Wt        |              |            | 0.10           |

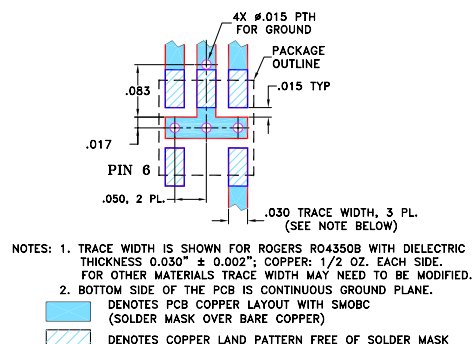
### AT1030 (DBTC-20-4-75L)



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

## Demo Board MCL P/N: TB-279

### Suggested PCB Layout (PL-151)



## 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

- CATV

## Electrical Specifications

| FREQ.<br>(MHz) | COUPLING<br>(dB) | MAINLINE LOSS*<br>(dB) |      |      |      |      |      |      |      |      |      | DIRECTIVITY<br>(dB) |      |      |      |      |                |      |      | VSWR**<br>(:1) | POWER<br>INPUT<br>(W) |   |                          |  |
|----------------|------------------|------------------------|------|------|------|------|------|------|------|------|------|---------------------|------|------|------|------|----------------|------|------|----------------|-----------------------|---|--------------------------|--|
|                |                  | L                      |      |      |      |      | M    |      |      |      |      | U                   |      |      |      |      | U <sup>1</sup> |      |      |                |                       | L | MUU <sup>1</sup><br>Max. |  |
|                |                  | Typ.                   | Max. | Typ. | Max. | Typ. | Max. | Typ. | Max. | Typ. | Max. | Typ.                | Min. | Typ. | Min. | Typ. | Min.           | Typ. | Min. |                |                       |   |                          |  |
| 5-1250         | 20.5±0.5         | ±0.9                   | 0.4  | 0.7  | 0.6  | 0.9  | 0.8  | 1.2  | 1.1  | 1.5  | 20   | 16                  | 19   | 13   | 11   | 7    | 9              | 6    | 1.4  | 0.5            | 1.0                   |   |                          |  |

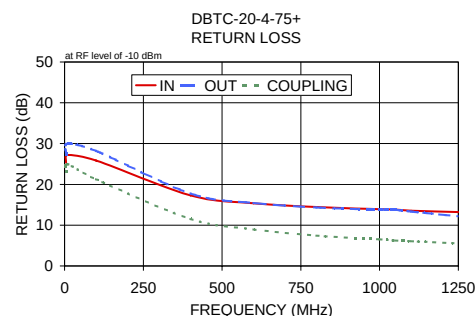
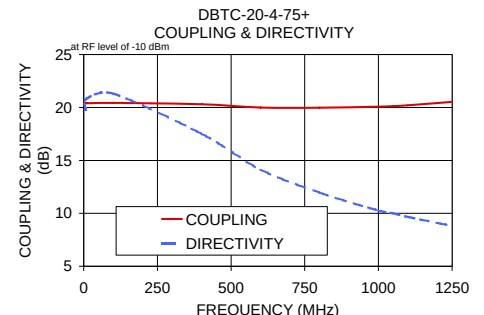
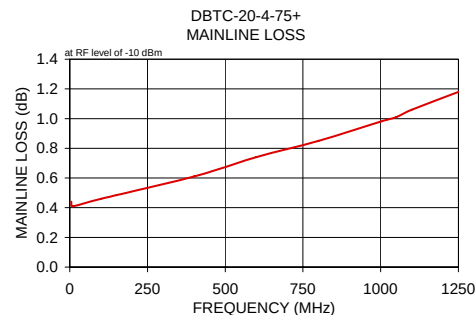
L = 5-50 MHz M = 50-500 MHz U = 500-1000 MHz U<sup>1</sup> = 1000 - 1250 MHz

\* Includes theoretical coupled power loss of 0.04 dB at 20 dB coupling

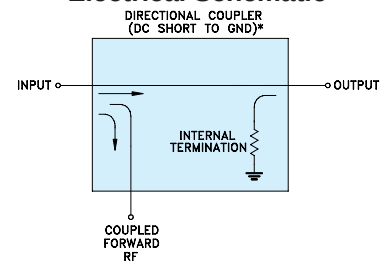
\*\* For coupled port VSWR above 500 MHz, 1.6:1 typ.

## Typical Performance Data

| Frequency<br>(MHz) | Mainline Loss<br>(dB)<br>In-Out | Coupling<br>(dB)<br>In-Cpl | Directivity<br>(dB) | Return Loss<br>(dB) |       |       |
|--------------------|---------------------------------|----------------------------|---------------------|---------------------|-------|-------|
|                    |                                 |                            |                     | In                  | Out   | Cpl   |
| 5.00               | 0.44                            | 20.47                      | 19.75               | 25.31               | 27.17 | 23.11 |
| 10.00              | 0.41                            | 20.40                      | 20.84               | 27.21               | 29.99 | 24.93 |
| 100.00             | 0.46                            | 20.44                      | 21.31               | 25.84               | 28.18 | 21.27 |
| 400.00             | 0.61                            | 20.30                      | 17.52               | 17.30               | 17.77 | 11.54 |
| 600.00             | 0.74                            | 19.99                      | 14.13               | 15.36               | 15.44 | 8.94  |
| 800.00             | 0.85                            | 19.98                      | 11.96               | 14.44               | 14.31 | 7.43  |
| 1000.00            | 0.98                            | 20.07                      | 10.26               | 13.93               | 13.80 | 6.52  |
| 1050.00            | 1.01                            | 20.13                      | 10.01               | 13.85               | 13.76 | 6.23  |
| 1100.00            | 1.06                            | 20.21                      | 9.66                | 13.53               | 13.35 | 6.08  |
| 1250.00            | 1.18                            | 20.53                      | 8.81                | 13.22               | 12.20 | 5.55  |



## Electrical Schematic



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

For detailed performance specs & shopping online see web site

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ED-10793A/1