

top hat®

Surface Mount Directional Coupler

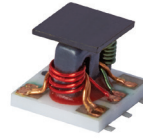
75Ω, 20dB coupling, 5 to 1250 MHz

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

Applications

- CATV



Generic photo used for illustration purposes only

CASE STYLE: AT1642

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

| Reel Size | Devices/Reel |
|-----------|-----------------------|
| 7" | 20, 50, 100, 200, 500 |
| 13" | 1000, 2000 |

Electrical Specifications at 25°C

| Parameter | Condition (MHz) | Min. | Typ. | Max. | Unit |
|----------------------------|-----------------|------|-----------|------|------|
| Frequency Range | | 5 | | 1250 | MHz |
| Mainline Loss ¹ | 5-50 | | 0.4 | 0.7 | dB |
| | 50-500 | | 0.6 | 0.9 | |
| | 500-1000 | | 0.8 | 1.2 | |
| | 1000-1250 | | 1.1 | 1.5 | |
| Nominal Coupling | 5-1250 | | 20.5 ±0.5 | | dB |
| Coupling Flatness(±) | 5-1250 | | | ±0.9 | dB |
| Directivity | 5-50 | 16 | 20 | | dB |
| | 50-500 | 13 | 19 | | |
| | 500-1000 | 7 | 11 | | |
| | 1000-1250 | 6 | 9 | | |
| VSWR ² | 5-1000 | | 1.4 | | dB |
| Input Power | 5-50 | | | 0.5 | W |
| | 50-500 | | | 1.0 | |
| | 500-1000 | | | 1.0 | |
| | 1000-1250 | | | 1.0 | |

1. Includes theoretical coupled power loss of 0.04 dB at 20 dB coupling.

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

Maximum Ratings

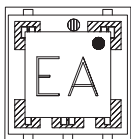
| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

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

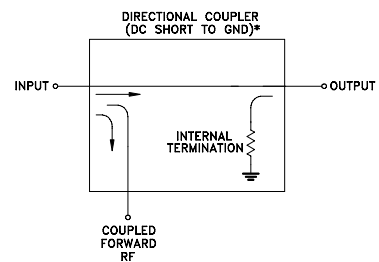
Pin Connections

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

Product Marking



Electrical Schematic

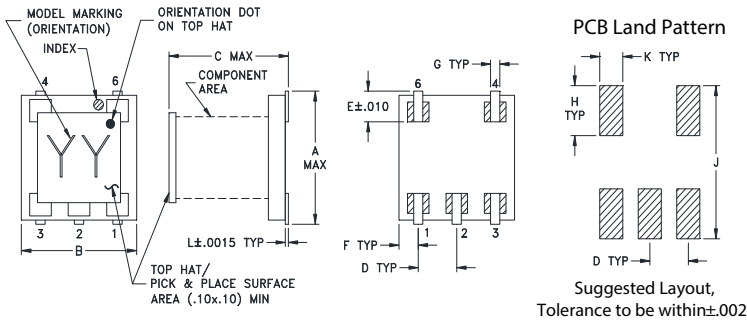


* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.



DBTC-20-4-75LX+

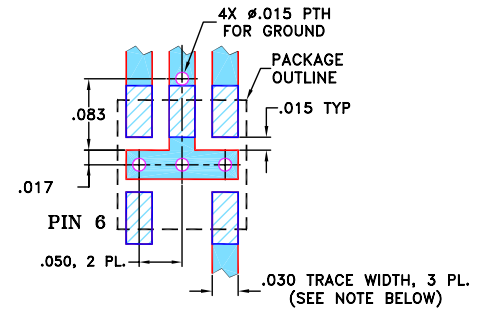
Outline Drawing





Outline Dimensions (inch/mm)

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

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

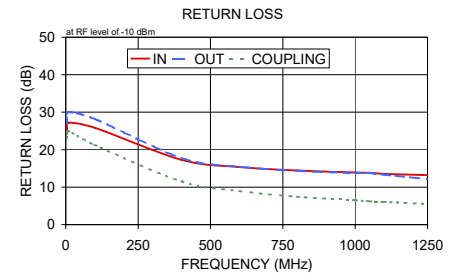
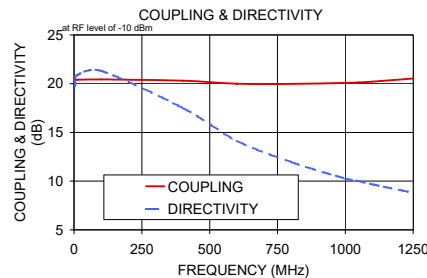
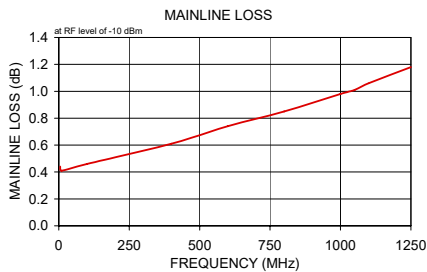


- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  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) | In | Return Loss (dB) 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 |



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.
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