

Surface Mount Directional Coupler

DBTC-20-4LX+

50Ω, 20dB coupling, 20 to 1000 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

- VHF/UHF receivers/transmitters
- cellular



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

| Available Tape and Reel at no extra cost | |
|--|-----------------------|
| 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 | | 20 | | 1000 | MHz |
| Mainline Loss ¹ | 20-200 | | 0.3 | 1.0 | dB |
| | 200-500 | | 0.4 | 1.0 | |
| | 500-1000 | | 0.7 | 1.3 | |
| Nominal Coupling | 20-1000 | | 20.4±0.5 | | dB |
| Coupling Flatness(±) | 20-1000 | | | ±0.8 | dB |
| Directivity | 20-200 | 13 | 21 | | dB |
| | 200-500 | 14 | 21 | | |
| | 500-1000 | — | 16 | | |
| VSWR ² | 20-1000 | | 1.2 | | dB |
| Input Power | 20-200 | | | 1.0 | W |
| | 200-500 | | | 1.0 | |
| | 500-1000 | | | 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

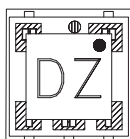
| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

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

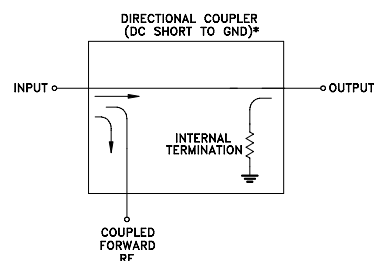
Pin Connections

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

Product Marking



Electrical Schematic

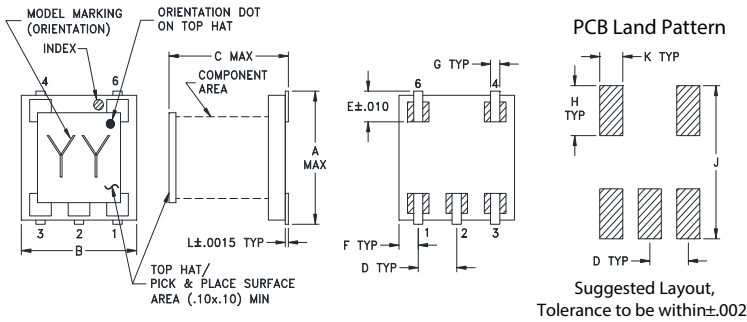


* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.



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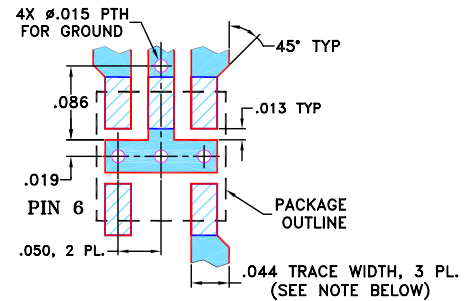
Outline Drawing



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-278 Suggested PCB Layout (PL-150)

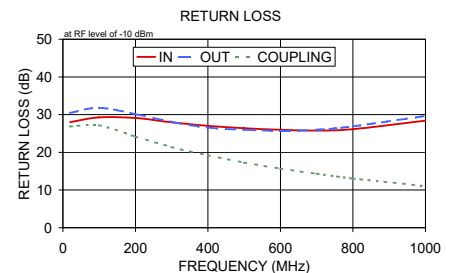
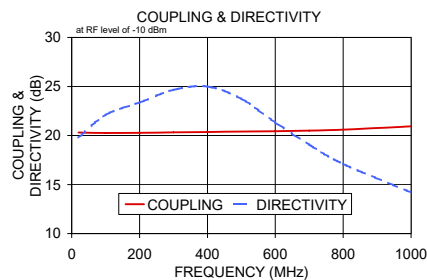
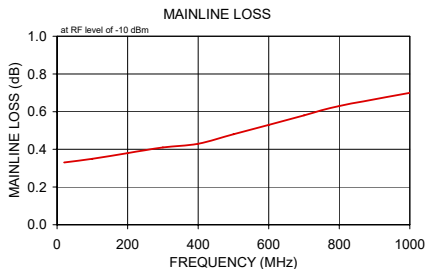


- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 20.00 | 0.33 | 20.30 | 19.79 | 28.00 | 30.48 | 26.85 |
| 100.00 | 0.35 | 20.25 | 22.11 | 29.28 | 31.80 | 27.18 |
| 200.00 | 0.38 | 20.28 | 23.36 | 29.12 | 30.13 | 24.16 |
| 300.00 | 0.41 | 20.32 | 24.66 | 27.95 | 28.09 | 21.44 |
| 400.00 | 0.43 | 20.36 | 25.00 | 27.01 | 26.54 | 19.23 |
| 500.00 | 0.48 | 20.40 | 23.74 | 26.41 | 25.97 | 17.30 |
| 600.00 | 0.53 | 20.43 | 21.33 | 25.99 | 25.74 | 15.69 |
| 700.00 | 0.58 | 20.50 | 19.06 | 25.78 | 26.00 | 14.31 |
| 800.00 | 0.63 | 20.59 | 17.10 | 26.16 | 26.88 | 13.07 |
| 1000.00 | 0.70 | 20.94 | 14.20 | 28.41 | 29.64 | 11.03 |



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-Circuit's applicable established test performance criteria and measurement instructions.
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