

High Power Bi-Directional Coupler

BDCA-7-25+

50Ω 7dB Coupling DC Pass 1200 to 2500 MHz



Maximum Ratings

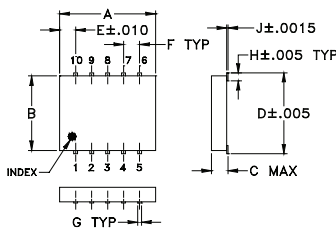
| | |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| DC Current | 0.25A |

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

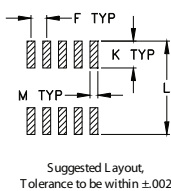
Pin Connections

| | |
|-------------------|-------------|
| INPUT | 1 |
| OUTPUT | 6 |
| COUPLED (forward) | 10 |
| COUPLED (reverse) | 5 |
| GROUND | 2,3,4,7,8,9 |

Outline Drawing



PCB Land Pattern

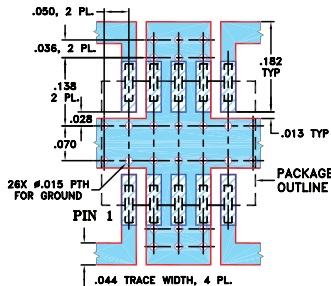


Suggested Layout, Tolerance to be within ±0.02

Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G |
|------|------|------|------|------|-------|------|
| .30 | .250 | .052 | .266 | .050 | .050 | .012 |
| 7.62 | 6.35 | 1.32 | 6.76 | 1.27 | 1.27 | 0.30 |
| H | J | K | L | M | wt | |
| .029 | .004 | .085 | .296 | .030 | grams | |
| 0.74 | 0.10 | 2.16 | 7.52 | 0.76 | 0.25 | |

Demo Board MCL P/N: TB-115+ Suggested PCB Layout (PL-004)



- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .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

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.
 C. The parts covered by this specification document are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp

Features

- four-port coupler
- wideband, 1200 to 2500 MHz
- excellent VSWR, 1.05:1 typ. all ports
- good flatness, ±0.3 dB typ.
- excellent power handling capability, 35W (2100 MHz)
- hermetically sealed
- minimal variation with temperature variation
- low profile, 0.052" height
- protected by US Patent 7,049,905
- DC current through input to output 0.25A Max. at 1.0 watt RF input power.

Applications

- PCS, PCN, UMTS
- ISM
- GPS
- defense

Bi-Directional Coupler Electrical Specifications

| FREQUENCY (MHz) | COUPLING (dB) | | MAINLINE LOSS ¹ (dB) | | DIRECTIVITY (dB) | | VSWR (:1) | POWER INPUT ² (W) |
|-----------------|---------------|---------------|---------------------------------|------|------------------|------|-----------|------------------------------|
| | Nom. | Max. Flatness | Typ. | Max. | Typ. | Min. | | |
| $f_c - f_u$ | | | | | | | | |
| 1200-2500 | | | | | | | | |
| 1200-1700 | 7.1±0.8 | ±0.8 | 1.5 | 1.9 | 22 | 19 | 1.08 | 35 |
| 1700-2100 | 6.5±0.5 | ±0.3 | 1.6 | 2.0 | 22 | 14 | 1.05 | 35 |
| 2100-2500 | 7.0±0.8 | ±1.0 | 1.5 | 2.0 | 22 | 12 | 1.10 | 27 |

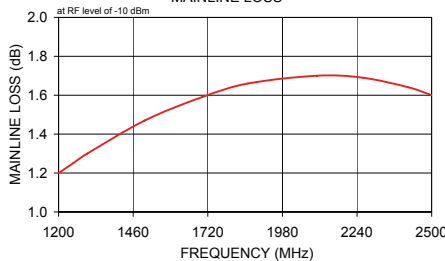
1. Includes theoretical power loss of 1.0 dB at 7 dB coupling.

2. Derate linearly 1/3 at 100°C

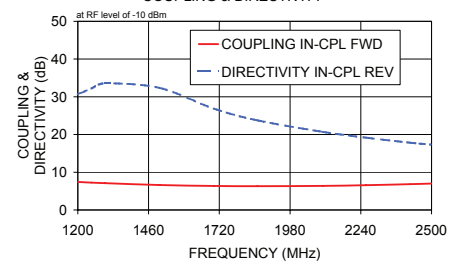
Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) | | Coupling (dB) | | Directivity (dB) | | Return Loss (dB) | | | |
|-----------------|--------------------|------------|---------------|-------------|------------------|-------|------------------|---------|---------|--|
| | In-Out | In-Cpl Fwd | Out-Cpl Rev | Out-Cpl Fwd | In-Cpl Rev | In | Out | Cpl Fwd | Cpl Rev | |
| 1200.00 | 1.20 | 7.44 | 7.44 | 28.71 | 30.67 | 33.76 | 38.52 | 34.05 | 31.62 | |
| 1250.00 | 1.25 | 7.25 | 7.26 | 28.83 | 32.19 | 34.26 | 41.86 | 36.87 | 33.16 | |
| 1300.00 | 1.30 | 7.10 | 7.09 | 28.92 | 33.55 | 34.75 | 58.50 | 42.17 | 34.02 | |
| 1500.00 | 1.47 | 6.62 | 6.62 | 26.70 | 32.36 | 29.75 | 32.95 | 35.05 | 30.66 | |
| 1700.00 | 1.59 | 6.36 | 6.37 | 23.78 | 26.87 | 25.23 | 26.63 | 27.37 | 25.76 | |
| 1860.00 | 1.66 | 6.30 | 6.30 | 21.94 | 23.76 | 23.19 | 23.89 | 24.17 | 23.22 | |
| 2100.00 | 1.70 | 6.39 | 6.38 | 19.67 | 20.71 | 21.34 | 21.69 | 21.28 | 20.95 | |
| 2260.00 | 1.69 | 6.57 | 6.56 | 18.53 | 19.15 | 20.76 | 21.18 | 20.21 | 20.12 | |
| 2420.00 | 1.64 | 6.84 | 6.84 | 17.58 | 17.85 | 20.67 | 21.04 | 19.83 | 19.80 | |
| 2500.00 | 1.60 | 7.01 | 7.00 | 17.10 | 17.32 | 20.88 | 21.37 | 19.63 | 19.70 | |

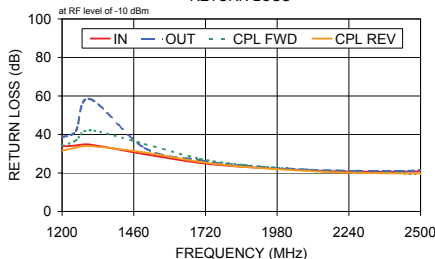
BDCA-7-25+ MAINLINE LOSS



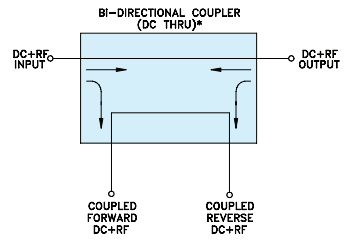
BDCA-7-25+ COUPLING & DIRECTIVITY



BDCA-7-25+ RETURN LOSS



Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

