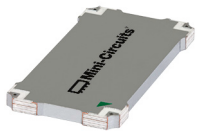
STRIPLINE SURFACE MOUNT

# Bi-Directional Coupler BDCH-20-272+

50Ω 700 to 2700 MHz 20 dB 150W

## KEY FEATURES

- High power handling, up to 150W
- Ultra wideband, 700 to 2700 MHz
- Low insertion loss, 0.2 dB

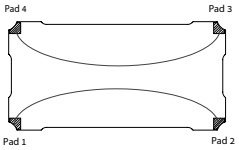


*Generic photo used for illustration purposes only*

## APPLICATIONS

- Power amplifiers
- Antenna feeds
- Mobile satellite communication
- Digital communication applications

## FUNCTIONAL DIAGRAM




## PRODUCT OVERVIEW

Mini-Circuits' BDCH-20-272+ is a high-power bi-directional coupler providing high power handling up to 150 W and insertion loss of 0.2 dB. High directivity of 21 dB provides accurate sampling from the coupled port, and 25 dB return loss provides excellent matching over full frequency range. Covering frequencies from 700 to 2700 MHz, the model supports a wide variety of applications from power amplifiers and antenna feeds to various digital communications and more. The coupler is designed into an open printed laminate (1.00" x 0.50" x 0.051") with wrap-around terminations for good solderability and easy visual inspection.

## ELECTRICAL SPECIFICATIONS[1,2] AT +25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Frequency Range | | 700 | | 2700 | MHz |
| Insertion Loss[3] | 700-2700 | - | 0.2 | 0.35 | dB |
| Coupling Nominal | 700-2700 | - | 21±1 | - | dB |
| Coupling Flatness (±) | 700-2700 | - | ±1 | - | dB |
| | 800-2700 | - | ±0.5 | - | |
| Directivity | 700-2700 | 15 | 21 | - | dB |
| Return Loss (Input/Output) | 700-2700 | 20.5 | 25 | - | dB |
| Return Loss (Coupled Forward/Reverse) | 700-2700 | 20.5 | 25 | - | dB |
| Thermal Resistance[4] | 700-2700 | - | 0.5 | - | °C/W |

1. Tested on Evaluation Board TB-863-1+. De-embedded to the device reference plane.
2. Model is symmetrical and all ports are interchangeable, see Port Function Description/Configuration table for details and S-Parameters for actual performance.
3. Does not include theoretical loss due to coupling. Nominal theoretical loss is 0.03 dB.
4. Thermal Resistance is defined as, example (Θjc= (Hot Spot Temperature on DUT - Base Plate Temperature)/Input Power)

## ABSOLUTE MAXIMUM RATINGS[5]

| | | |
|---|---|---|
| **Operating Case Temperature[6]** | | -55 °C to +105 °C |
| **Storage Temperature** | | -55 °C to +105 °C |
| **Power Input** | +85 °C case | 150 W |
| | +95 °C case | 120 W |
| | +105 °C case | 90 W |
| **DC Current** | | 2.5 A |

5. Permanent damage may occur if any of these limits are exceeded.
6. Case temperature is defined as temperature on base plate.

REV. B
ECO-024406
RDF-2150
BDCH-20-272+
MCIL
250205

# Bi-Directional Coupler BDCH-20-272+

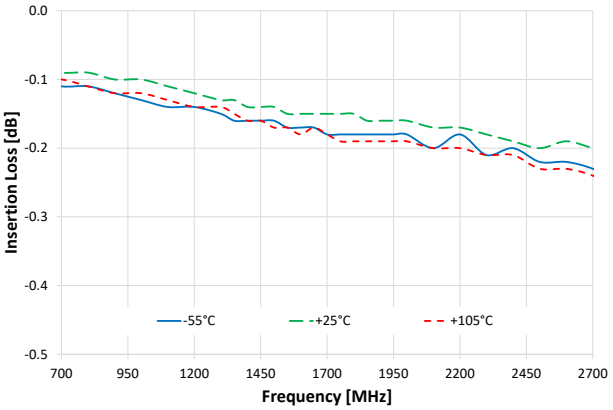
50Ω 700 to 2700 MHz 20 dB 150W

## TYPICAL PERFORMANCE GRAPHS

Note : Data corresponds to Configuration A at +25°C unless specified otherwise.

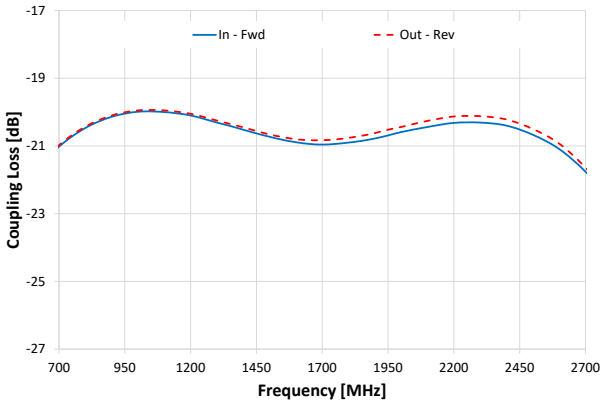
BDCH-20-272+

**Insertion Loss vs. Frequency**



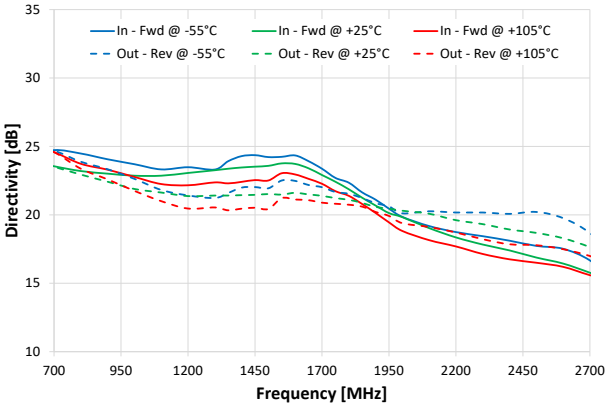

BDCH-20-272+

**Coupling Loss vs. Frequency**



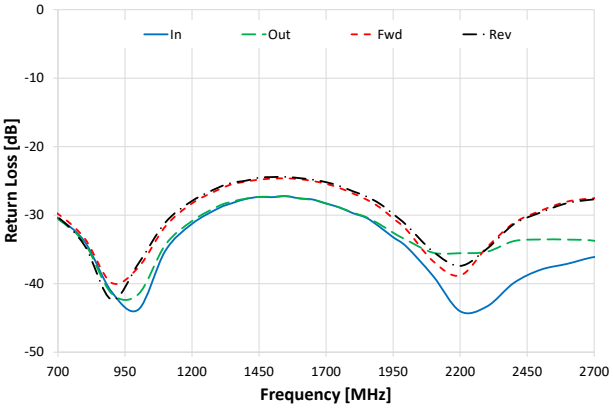

BDCH-20-272+

**Directivity vs. Frequency**




BDCH-20-272+

**Return Loss vs. Frequency**



STRIPLINE SURFACE MOUNT

# Bi-Directional Coupler BDCH-20-272+

50Ω 700 to 2700 MHz 20 dB 150W

## FUNCTIONAL DIAGRAM

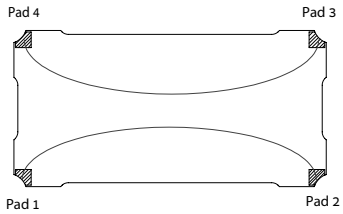



Figure 1. BDCH-20-272+ Functional Diagram

## PAD DESCRIPTION/CONFIGURATION [7]

| Function | Pad Number | Description |
|---|---|---|
| Input | 1 | Connects to RF Input Port |
| Output | 2 | Connects to RF Output Port |
| Coupled Forward | 4 | Connects to Coupled Forward Port |
| Coupled Reverse | 3 | Connects to Coupled Reverse Port |
| Ground | 5 | Connects to Ground |

| Configuration | Input | Output | Coupled Forward | Coupled Reverse |
|---|---|---|---|---|
| A | 1 | 2 | 4 | 3 |
| B | 2 | 1 | 3 | 4 |
| C | 3 | 4 | 2 | 1 |
| D | 4 | 3 | 1 | 2 |

7. Model is symmetrical and all ports are interchangeable, see Port Function Description/Configuration table for details and S-Parameters for actual performance.

## SUGGESTED PCB LAYOUT (PL-538)

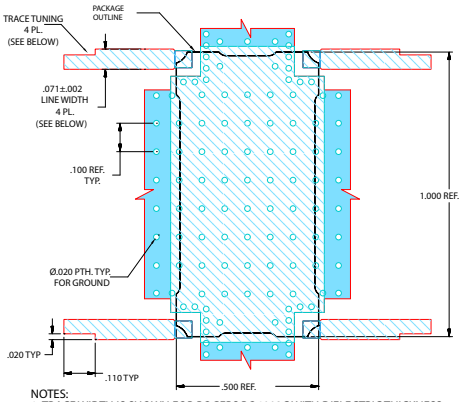
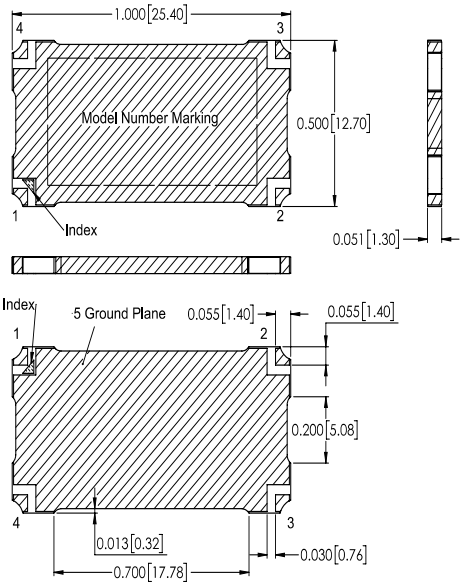
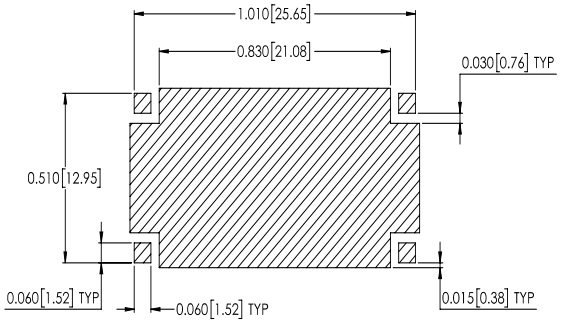



Figure 2. Suggested PCB Layout PL-538

## CASE STYLE DRAWING (PQ2098)




Suggested PCB Land Pattern




NOTES:
1. Base material: Printed wiring laminate.
2. Termination finish: 2-5 µinch (.05-.13 microns) Immersion Gold.
3. Weight: 2.0 grams
4. Marking may contain other features or characters for internal lot control.

Metallization

Solder Resist

## PRODUCT MARKING*: BDCH-20-272+

*Marking may contain other features or characters for internal lot control.

# Bi-Directional Coupler BDCH-20-272+

50Ω 700 to 2700 MHz 20 dB 150W

**ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.** CLICK HERE

| | |
|---|---|
| **Performance Data & Graphs** | Data<br>Graphs<br>S-Parameter (S4P Files) Data Set (.zip file) De-embedded to device pads |
| **Case Style** | PQ2098 Lead Finish: 2-5 µ inch (0.05-0.13 microns) Immersion Gold. |
| **RoHS Status** | Compliant |
| **Tape and Reel** | F118 |
| **Suggested Layout for PCB Design** | PL-538 |
| **Evaluation Board** | TB-863-1+ |
| | Gerber File |
| **Environmental Rating** | ENV02T8 |

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-Circuits' applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits' 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-Circuits' website at www.minicircuits.com/terms/viewterm.html

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.04 | -41.87 | -41.87 | 35.42 | -49.84 | -49.98 | -51.83 | -51.40 |
| 100 | -0.05 | -35.89 | -35.90 | 31.19 | -37.21 | -37.27 | -36.88 | -36.60 |
| 200 | -0.07 | -30.04 | -30.04 | 26.22 | -27.33 | -27.23 | -25.67 | -25.77 |
| 300 | -0.08 | -26.73 | -26.72 | 24.92 | -26.46 | -26.35 | -26.06 | -26.15 |
| 400 | -0.09 | -24.53 | -24.50 | 24.39 | -27.72 | -27.90 | -26.96 | -27.14 |
| 500 | -0.09 | -22.96 | -22.93 | 24.71 | -30.66 | -30.84 | -28.71 | -29.14 |
| 600 | -0.10 | -21.82 | -21.79 | 24.22 | -32.69 | -33.05 | -29.73 | -30.16 |
| 700 | -0.11 | -21.02 | -20.99 | 24.73 | -33.68 | -34.22 | -34.04 | -34.94 |
| 800 | -0.11 | -20.47 | -20.43 | 24.48 | -36.19 | -36.36 | -35.86 | -37.04 |
| 900 | -0.12 | -20.15 | -20.10 | 24.06 | -41.27 | -42.29 | -39.44 | -42.36 |
| 1000 | -0.13 | -19.99 | -19.95 | 23.70 | -45.92 | -41.70 | -37.28 | -36.32 |
| 1100 | -0.14 | -19.98 | -19.94 | 23.32 | -36.64 | -35.26 | -31.59 | -30.98 |
| 1200 | -0.14 | -20.08 | -20.05 | 23.48 | -30.91 | -30.55 | -27.43 | -27.10 |
| 1300 | -0.15 | -20.26 | -20.23 | 23.31 | -28.13 | -27.73 | -25.22 | -24.90 |
| 1350 | -0.16 | -20.37 | -20.35 | 23.92 | -27.25 | -26.88 | -24.40 | -24.20 |
| 1400 | -0.16 | -20.49 | -20.44 | 24.29 | -26.07 | -26.08 | -23.84 | -23.69 |
| 1450 | -0.16 | -20.60 | -20.55 | 24.36 | -25.48 | -25.60 | -23.57 | -23.31 |
| 1500 | -0.16 | -20.69 | -20.64 | 24.22 | -25.77 | -25.67 | -23.73 | -23.52 |
| 1550 | -0.17 | -20.77 | -20.73 | 24.24 | -25.85 | -25.72 | -24.01 | -23.61 |
| 1600 | -0.17 | -20.84 | -20.77 | 24.34 | -25.76 | -25.83 | -23.92 | -23.67 |
| 1650 | -0.17 | -20.88 | -20.78 | 23.92 | -25.75 | -26.13 | -24.07 | -23.80 |
| 1700 | -0.18 | -20.90 | -20.79 | 23.37 | -27.01 | -27.08 | -24.85 | -24.60 |
| 1750 | -0.18 | -20.88 | -20.77 | 22.70 | -28.20 | -28.25 | -26.03 | -25.65 |
| 1800 | -0.18 | -20.82 | -20.73 | 22.35 | -29.06 | -29.45 | -26.93 | -26.53 |
| 1850 | -0.18 | -20.76 | -20.67 | 21.64 | -29.86 | -30.91 | -27.90 | -27.57 |
| 1900 | -0.18 | -20.70 | -20.57 | 21.11 | -32.94 | -33.38 | -29.64 | -29.46 |
| 1950 | -0.18 | -20.63 | -20.47 | 20.45 | -36.17 | -35.70 | -32.17 | -32.06 |
| 2000 | -0.18 | -20.56 | -20.38 | 19.85 | -36.21 | -36.75 | -34.08 | -34.67 |
| 2100 | -0.20 | -20.39 | -20.21 | 19.18 | -38.72 | -35.88 | -36.02 | -40.87 |
| 2200 | -0.18 | -20.28 | -20.09 | 18.74 | -33.41 | -32.30 | -32.11 | -33.77 |
| 2300 | -0.21 | -20.25 | -20.08 | 18.44 | -35.23 | -32.62 | -30.66 | -31.23 |
| 2400 | -0.20 | -20.34 | -20.20 | 18.11 | -34.28 | -32.04 | -28.94 | -28.86 |
| 2500 | -0.22 | -20.62 | -20.49 | 17.73 | -37.07 | -33.16 | -29.10 | -29.14 |
| 2600 | -0.22 | -21.05 | -20.93 | 17.52 | -36.65 | -34.09 | -29.70 | -29.48 |
| 2700 | -0.23 | -21.72 | -21.62 | 16.67 | -36.84 | -35.47 | -30.65 | -30.90 |
| 2800 | -0.25 | -22.69 | -22.59 | 15.02 | -35.06 | -37.75 | -30.54 | -30.19 |
| 2900 | -0.22 | -23.86 | -23.77 | 14.21 | -37.20 | -39.48 | -29.77 | -29.34 |
| 3000 | -0.25 | -25.58 | -25.49 | 12.35 | -37.09 | -43.92 | -28.68 | -28.01 |
| 3100 | -0.24 | -28.02 | -27.98 | 9.89 | -35.10 | -35.93 | -27.47 | -27.03 |
| 3200 | -0.28 | -31.90 | -31.91 | 5.55 | -32.30 | -33.92 | -26.54 | -25.81 |
| 3300 | -0.27 | -37.92 | -37.82 | 1.52 | -29.99 | -30.30 | -25.98 | -25.42 |

Surface Mount

# Bi-Directional Coupler

## BDCH-20-272+

### Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.02 | -41.87 | -41.87 | 35.81 | -49.98 | -49.84 | -51.40 | -51.83 |
| 100 | -0.03 | -35.90 | -35.89 | 30.57 | -37.27 | -37.21 | -36.60 | -36.88 |
| 200 | -0.05 | -30.04 | -30.04 | 25.93 | -27.23 | -27.33 | -25.77 | -25.67 |
| 300 | -0.06 | -26.72 | -26.73 | 25.12 | -26.35 | -26.46 | -26.15 | -26.06 |
| 400 | -0.07 | -24.50 | -24.53 | 24.75 | -27.90 | -27.72 | -27.14 | -26.96 |
| 500 | -0.07 | -22.93 | -22.96 | 25.04 | -30.84 | -30.66 | -29.14 | -28.71 |
| 600 | -0.08 | -21.79 | -21.82 | 24.79 | -33.05 | -32.69 | -30.16 | -29.73 |
| 700 | -0.09 | -20.99 | -21.02 | 24.67 | -34.22 | -33.68 | -34.94 | -34.04 |
| 800 | -0.10 | -20.43 | -20.47 | 23.88 | -36.36 | -36.19 | -37.04 | -35.86 |
| 900 | -0.10 | -20.10 | -20.15 | 23.33 | -42.29 | -41.27 | -42.36 | -39.44 |
| 1000 | -0.11 | -19.95 | -19.99 | 22.63 | -41.70 | -45.92 | -36.32 | -37.28 |
| 1100 | -0.12 | -19.94 | -19.98 | 21.82 | -35.26 | -36.64 | -30.98 | -31.59 |
| 1200 | -0.13 | -20.05 | -20.08 | 21.42 | -30.55 | -30.91 | -27.10 | -27.43 |
| 1300 | -0.14 | -20.23 | -20.26 | 21.23 | -27.73 | -28.13 | -24.90 | -25.22 |
| 1350 | -0.14 | -20.35 | -20.37 | 21.60 | -26.88 | -27.25 | -24.20 | -24.40 |
| 1400 | -0.15 | -20.44 | -20.49 | 21.99 | -26.08 | -26.07 | -23.69 | -23.84 |
| 1450 | -0.15 | -20.55 | -20.60 | 22.03 | -25.60 | -25.48 | -23.31 | -23.57 |
| 1500 | -0.15 | -20.64 | -20.69 | 21.94 | -25.67 | -25.77 | -23.52 | -23.73 |
| 1550 | -0.16 | -20.73 | -20.77 | 22.51 | -25.72 | -25.85 | -23.61 | -24.01 |
| 1600 | -0.16 | -20.77 | -20.84 | 22.48 | -25.83 | -25.76 | -23.67 | -23.92 |
| 1650 | -0.16 | -20.78 | -20.88 | 22.18 | -26.13 | -25.75 | -23.80 | -24.07 |
| 1700 | -0.17 | -20.79 | -20.90 | 22.02 | -27.08 | -27.01 | -24.60 | -24.85 |
| 1750 | -0.17 | -20.77 | -20.88 | 21.67 | -28.25 | -28.20 | -25.65 | -26.03 |
| 1800 | -0.17 | -20.73 | -20.82 | 21.54 | -29.45 | -29.06 | -26.53 | -26.93 |
| 1850 | -0.17 | -20.67 | -20.76 | 21.23 | -30.91 | -29.86 | -27.57 | -27.90 |
| 1900 | -0.17 | -20.57 | -20.70 | 20.85 | -33.38 | -32.94 | -29.46 | -29.64 |
| 1950 | -0.17 | -20.47 | -20.63 | 20.62 | -35.70 | -36.17 | -32.06 | -32.17 |
| 2000 | -0.18 | -20.38 | -20.56 | 20.11 | -36.75 | -36.21 | -34.67 | -34.08 |
| 2100 | -0.19 | -20.21 | -20.39 | 20.26 | -35.88 | -38.72 | -40.87 | -36.02 |
| 2200 | -0.17 | -20.09 | -20.28 | 20.17 | -32.30 | -33.41 | -33.77 | -32.11 |
| 2300 | -0.20 | -20.08 | -20.25 | 20.17 | -32.62 | -35.23 | -31.23 | -30.66 |
| 2400 | -0.18 | -20.20 | -20.34 | 20.07 | -32.04 | -34.28 | -28.86 | -28.94 |
| 2500 | -0.21 | -20.49 | -20.62 | 20.21 | -33.16 | -37.07 | -29.14 | -29.10 |
| 2600 | -0.20 | -20.93 | -21.05 | 19.76 | -34.09 | -36.65 | -29.48 | -29.70 |
| 2700 | -0.21 | -21.62 | -21.72 | 18.67 | -35.47 | -36.84 | -30.90 | -30.65 |
| 2800 | -0.23 | -22.59 | -22.69 | 16.76 | -37.75 | -35.06 | -30.19 | -30.54 |
| 2900 | -0.21 | -23.77 | -23.86 | 15.75 | -39.48 | -37.20 | -29.34 | -29.77 |
| 3000 | -0.23 | -25.49 | -25.58 | 13.74 | -43.92 | -37.09 | -28.01 | -28.68 |
| 3100 | -0.22 | -27.98 | -28.02 | 11.20 | -35.93 | -35.10 | -27.03 | -27.47 |
| 3200 | -0.26 | -31.91 | -31.90 | 6.71 | -33.92 | -32.30 | -25.81 | -26.54 |
| 3300 | -0.24 | -37.82 | -37.92 | 2.33 | -30.30 | -29.99 | -25.42 | -25.98 |

Surface Mount

# Bi-Directional Coupler

## BDCH-20-272+

### Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.88 | -41.88 | 37.47 | -51.40 | -51.83 | -49.98 | -49.84 |
| 100 | -0.04 | -35.90 | -35.90 | 31.86 | -36.60 | -36.88 | -37.27 | -37.21 |
| 200 | -0.06 | -30.05 | -30.05 | 25.93 | -25.77 | -25.67 | -27.23 | -27.33 |
| 300 | -0.07 | -26.73 | -26.74 | 24.80 | -26.15 | -26.06 | -26.35 | -26.46 |
| 400 | -0.07 | -24.52 | -24.53 | 24.28 | -27.14 | -26.96 | -27.90 | -27.72 |
| 500 | -0.08 | -22.94 | -22.96 | 24.96 | -29.14 | -28.71 | -30.84 | -30.66 |
| 600 | -0.09 | -21.81 | -21.83 | 24.71 | -30.16 | -29.73 | -33.05 | -32.69 |
| 700 | -0.09 | -21.00 | -21.03 | 25.30 | -34.94 | -34.04 | -34.22 | -33.68 |
| 800 | -0.10 | -20.45 | -20.48 | 24.97 | -37.04 | -35.86 | -36.36 | -36.19 |
| 900 | -0.10 | -20.12 | -20.15 | 24.26 | -42.36 | -39.44 | -42.29 | -41.27 |
| 1000 | -0.11 | -19.96 | -19.99 | 23.47 | -36.32 | -37.28 | -41.70 | -45.92 |
| 1100 | -0.12 | -19.95 | -19.99 | 22.77 | -30.98 | -31.59 | -35.26 | -36.64 |
| 1200 | -0.13 | -20.06 | -20.08 | 22.44 | -27.10 | -27.43 | -30.55 | -30.91 |
| 1300 | -0.14 | -20.24 | -20.26 | 22.19 | -24.90 | -25.22 | -27.73 | -28.13 |
| 1350 | -0.15 | -20.36 | -20.38 | 22.77 | -24.20 | -24.40 | -26.88 | -27.25 |
| 1400 | -0.15 | -20.44 | -20.50 | 23.15 | -23.69 | -23.84 | -26.08 | -26.07 |
| 1450 | -0.15 | -20.55 | -20.61 | 23.41 | -23.31 | -23.57 | -25.60 | -25.48 |
| 1500 | -0.15 | -20.65 | -20.70 | 23.43 | -23.52 | -23.73 | -25.67 | -25.77 |
| 1550 | -0.16 | -20.73 | -20.79 | 23.60 | -23.61 | -24.01 | -25.72 | -25.85 |
| 1600 | -0.17 | -20.77 | -20.85 | 23.96 | -23.67 | -23.92 | -25.83 | -25.76 |
| 1650 | -0.16 | -20.79 | -20.89 | 23.86 | -23.80 | -24.07 | -26.13 | -25.75 |
| 1700 | -0.17 | -20.80 | -20.91 | 23.51 | -24.60 | -24.85 | -27.08 | -27.01 |
| 1750 | -0.16 | -20.78 | -20.90 | 23.11 | -25.65 | -26.03 | -28.25 | -28.20 |
| 1800 | -0.17 | -20.74 | -20.84 | 22.92 | -26.53 | -26.93 | -29.45 | -29.06 |
| 1850 | -0.17 | -20.68 | -20.77 | 22.51 | -27.57 | -27.90 | -30.91 | -29.86 |
| 1900 | -0.16 | -20.58 | -20.71 | 22.13 | -29.46 | -29.64 | -33.38 | -32.94 |
| 1950 | -0.16 | -20.49 | -20.64 | 21.70 | -32.06 | -32.17 | -35.70 | -36.17 |
| 2000 | -0.16 | -20.39 | -20.57 | 21.09 | -34.67 | -34.08 | -36.75 | -36.21 |
| 2100 | -0.18 | -20.22 | -20.40 | 20.65 | -40.87 | -36.02 | -35.88 | -38.72 |
| 2200 | -0.16 | -20.11 | -20.29 | 20.14 | -33.77 | -32.11 | -32.30 | -33.41 |
| 2300 | -0.19 | -20.10 | -20.26 | 19.76 | -31.23 | -30.66 | -32.62 | -35.23 |
| 2400 | -0.18 | -20.22 | -20.35 | 19.08 | -28.86 | -28.94 | -32.04 | -34.28 |
| 2500 | -0.21 | -20.50 | -20.64 | 18.45 | -29.14 | -29.10 | -33.16 | -37.07 |
| 2600 | -0.20 | -20.95 | -21.06 | 17.98 | -29.48 | -29.70 | -34.09 | -36.65 |
| 2700 | -0.20 | -21.63 | -21.73 | 16.89 | -30.90 | -30.65 | -35.47 | -36.84 |
| 2800 | -0.22 | -22.61 | -22.69 | 15.06 | -30.19 | -30.54 | -37.75 | -35.06 |
| 2900 | -0.20 | -23.78 | -23.87 | 14.16 | -29.34 | -29.77 | -39.48 | -37.20 |
| 3000 | -0.23 | -25.51 | -25.58 | 12.34 | -28.01 | -28.68 | -43.92 | -37.09 |
| 3100 | -0.22 | -27.99 | -28.03 | 9.84 | -27.03 | -27.47 | -35.93 | -35.10 |
| 3200 | -0.24 | -31.93 | -31.91 | 5.52 | -25.81 | -26.54 | -33.92 | -32.30 |
| 3300 | -0.24 | -37.85 | -37.96 | 1.48 | -25.42 | -25.98 | -30.30 | -29.99 |

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.04 | -41.88 | -41.88 | 36.61 | -51.83 | -51.40 | -49.84 | -49.98 |
| 100 | -0.05 | -35.90 | -35.90 | 30.60 | -36.88 | -36.60 | -37.21 | -37.27 |
| 200 | -0.06 | -30.05 | -30.05 | 25.76 | -25.67 | -25.77 | -27.33 | -27.23 |
| 300 | -0.07 | -26.74 | -26.73 | 24.77 | -26.06 | -26.15 | -26.46 | -26.35 |
| 400 | -0.08 | -24.53 | -24.52 | 24.17 | -26.96 | -27.14 | -27.72 | -27.90 |
| 500 | -0.09 | -22.96 | -22.94 | 24.37 | -28.71 | -29.14 | -30.66 | -30.84 |
| 600 | -0.09 | -21.83 | -21.81 | 24.11 | -29.73 | -30.16 | -32.69 | -33.05 |
| 700 | -0.10 | -21.03 | -21.00 | 24.20 | -34.04 | -34.94 | -33.68 | -34.22 |
| 800 | -0.10 | -20.48 | -20.45 | 23.60 | -35.86 | -37.04 | -36.19 | -36.36 |
| 900 | -0.11 | -20.15 | -20.12 | 23.31 | -39.44 | -42.36 | -41.27 | -42.29 |
| 1000 | -0.12 | -19.99 | -19.96 | 22.98 | -37.28 | -36.32 | -45.92 | -41.70 |
| 1100 | -0.12 | -19.99 | -19.95 | 22.36 | -31.59 | -30.98 | -36.64 | -35.26 |
| 1200 | -0.13 | -20.08 | -20.06 | 22.21 | -27.43 | -27.10 | -30.91 | -30.55 |
| 1300 | -0.14 | -20.26 | -20.24 | 22.01 | -25.22 | -24.90 | -28.13 | -27.73 |
| 1350 | -0.15 | -20.38 | -20.36 | 22.37 | -24.40 | -24.20 | -27.25 | -26.88 |
| 1400 | -0.16 | -20.50 | -20.44 | 22.73 | -23.84 | -23.69 | -26.07 | -26.08 |
| 1450 | -0.16 | -20.61 | -20.55 | 22.69 | -23.57 | -23.31 | -25.48 | -25.60 |
| 1500 | -0.16 | -20.70 | -20.65 | 22.51 | -23.73 | -23.52 | -25.77 | -25.67 |
| 1550 | -0.17 | -20.79 | -20.73 | 22.94 | -24.01 | -23.61 | -25.85 | -25.72 |
| 1600 | -0.17 | -20.85 | -20.77 | 22.68 | -23.92 | -23.67 | -25.76 | -25.83 |
| 1650 | -0.17 | -20.89 | -20.79 | 22.19 | -24.07 | -23.80 | -25.75 | -26.13 |
| 1700 | -0.17 | -20.91 | -20.80 | 21.84 | -24.85 | -24.60 | -27.01 | -27.08 |
| 1750 | -0.17 | -20.90 | -20.78 | 21.23 | -26.03 | -25.65 | -28.20 | -28.25 |
| 1800 | -0.18 | -20.84 | -20.74 | 20.90 | -26.93 | -26.53 | -29.06 | -29.45 |
| 1850 | -0.18 | -20.77 | -20.68 | 20.45 | -27.90 | -27.57 | -29.86 | -30.91 |
| 1900 | -0.17 | -20.71 | -20.58 | 20.00 | -29.64 | -29.46 | -32.94 | -33.38 |
| 1950 | -0.17 | -20.64 | -20.49 | 19.51 | -32.17 | -32.06 | -36.17 | -35.70 |
| 2000 | -0.17 | -20.57 | -20.39 | 18.99 | -34.08 | -34.67 | -36.21 | -36.75 |
| 2100 | -0.19 | -20.40 | -20.22 | 18.92 | -36.02 | -40.87 | -38.72 | -35.88 |
| 2200 | -0.17 | -20.29 | -20.11 | 18.85 | -32.11 | -33.77 | -33.41 | -32.30 |
| 2300 | -0.20 | -20.26 | -20.10 | 18.89 | -30.66 | -31.23 | -35.23 | -32.62 |
| 2400 | -0.18 | -20.35 | -20.22 | 19.03 | -28.94 | -28.86 | -34.28 | -32.04 |
| 2500 | -0.21 | -20.64 | -20.50 | 19.15 | -29.10 | -29.14 | -37.07 | -33.16 |
| 2600 | -0.20 | -21.06 | -20.95 | 18.92 | -29.70 | -29.48 | -36.65 | -34.09 |
| 2700 | -0.21 | -21.73 | -21.63 | 18.02 | -30.65 | -30.90 | -36.84 | -35.47 |
| 2800 | -0.23 | -22.69 | -22.61 | 16.35 | -30.54 | -30.19 | -35.06 | -37.75 |
| 2900 | -0.20 | -23.87 | -23.78 | 15.45 | -29.77 | -29.34 | -37.20 | -39.48 |
| 3000 | -0.23 | -25.58 | -25.51 | 13.53 | -28.68 | -28.01 | -37.09 | -43.92 |
| 3100 | -0.22 | -28.03 | -27.99 | 11.09 | -27.47 | -27.03 | -35.10 | -35.93 |
| 3200 | -0.25 | -31.91 | -31.93 | 6.72 | -26.54 | -25.81 | -32.30 | -33.92 |
| 3300 | -0.25 | -37.96 | -37.85 | 2.22 | -25.98 | -25.42 | -29.99 | -30.30 |

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.82 | -41.83 | 35.66 | -40.70 | -40.77 | -39.82 | -39.61 |
| 100 | -0.04 | -35.85 | -35.86 | 33.48 | -35.46 | -35.69 | -35.02 | -34.84 |
| 200 | -0.05 | -29.99 | -29.99 | 30.18 | -30.96 | -30.85 | -30.09 | -30.10 |
| 300 | -0.06 | -26.69 | -26.69 | 27.55 | -28.64 | -28.60 | -27.90 | -28.00 |
| 400 | -0.07 | -24.50 | -24.49 | 26.08 | -27.57 | -27.67 | -26.94 | -27.13 |
| 500 | -0.08 | -22.95 | -22.92 | 24.88 | -27.69 | -27.72 | -26.91 | -27.19 |
| 600 | -0.08 | -21.82 | -21.79 | 23.97 | -28.40 | -28.48 | -27.70 | -28.05 |
| 700 | -0.09 | -21.02 | -20.98 | 23.55 | -30.43 | -30.58 | -29.82 | -30.30 |
| 800 | -0.09 | -20.47 | -20.43 | 23.20 | -33.88 | -34.11 | -33.41 | -34.47 |
| 900 | -0.10 | -20.14 | -20.10 | 23.01 | -41.18 | -41.42 | -39.88 | -42.32 |
| 1000 | -0.10 | -19.99 | -19.95 | 22.86 | -43.78 | -41.54 | -37.62 | -37.08 |
| 1100 | -0.11 | -20.00 | -19.95 | 22.86 | -35.24 | -34.37 | -31.68 | -31.10 |
| 1200 | -0.12 | -20.10 | -20.05 | 23.06 | -31.27 | -30.86 | -28.28 | -27.93 |
| 1300 | -0.13 | -20.31 | -20.25 | 23.26 | -28.97 | -28.65 | -26.26 | -25.94 |
| 1350 | -0.13 | -20.41 | -20.35 | 23.37 | -28.24 | -28.02 | -25.48 | -25.27 |
| 1400 | -0.14 | -20.52 | -20.45 | 23.46 | -27.64 | -27.59 | -25.11 | -24.97 |
| 1450 | -0.14 | -20.63 | -20.56 | 23.52 | -27.34 | -27.33 | -24.81 | -24.53 |
| 1500 | -0.14 | -20.73 | -20.66 | 23.58 | -27.37 | -27.32 | -24.67 | -24.44 |
| 1550 | -0.15 | -20.82 | -20.74 | 23.76 | -27.22 | -27.23 | -24.62 | -24.41 |
| 1600 | -0.15 | -20.89 | -20.80 | 23.72 | -27.55 | -27.55 | -24.74 | -24.59 |
| 1650 | -0.15 | -20.94 | -20.83 | 23.40 | -27.71 | -27.77 | -25.01 | -24.82 |
| 1700 | -0.15 | -20.96 | -20.83 | 22.91 | -28.31 | -28.27 | -25.42 | -25.18 |
| 1750 | -0.15 | -20.94 | -20.81 | 22.42 | -28.87 | -28.88 | -26.03 | -25.74 |
| 1800 | -0.15 | -20.90 | -20.76 | 21.87 | -29.71 | -29.63 | -26.83 | -26.51 |
| 1850 | -0.16 | -20.85 | -20.70 | 21.25 | -30.38 | -30.29 | -27.70 | -27.26 |
| 1900 | -0.16 | -20.78 | -20.62 | 20.68 | -31.71 | -31.33 | -28.86 | -28.32 |
| 1950 | -0.16 | -20.69 | -20.52 | 20.13 | -33.22 | -32.56 | -30.47 | -29.83 |
| 2000 | -0.16 | -20.59 | -20.44 | 19.83 | -34.60 | -33.62 | -32.11 | -31.45 |
| 2100 | -0.17 | -20.44 | -20.26 | 19.03 | -38.92 | -35.49 | -36.75 | -35.34 |
| 2200 | -0.17 | -20.32 | -20.13 | 18.35 | -44.03 | -35.55 | -38.81 | -37.41 |
| 2300 | -0.18 | -20.31 | -20.12 | 17.83 | -43.33 | -35.34 | -34.69 | -34.91 |
| 2400 | -0.19 | -20.40 | -20.22 | 17.40 | -39.90 | -33.79 | -31.16 | -31.33 |
| 2500 | -0.20 | -20.67 | -20.50 | 16.88 | -37.97 | -33.55 | -29.36 | -29.61 |
| 2600 | -0.19 | -21.09 | -20.93 | 16.44 | -37.10 | -33.57 | -28.01 | -28.24 |
| 2700 | -0.20 | -21.76 | -21.64 | 15.77 | -36.11 | -33.74 | -27.52 | -27.69 |
| 2800 | -0.21 | -22.65 | -22.53 | 15.02 | -35.82 | -34.77 | -27.26 | -27.33 |
| 2900 | -0.22 | -23.94 | -23.84 | 13.73 | -35.72 | -35.07 | -27.54 | -27.45 |
| 3000 | -0.23 | -25.66 | -25.66 | 11.88 | -35.53 | -35.77 | -27.67 | -27.60 |
| 3100 | -0.23 | -28.06 | -27.99 | 9.69 | -34.81 | -35.22 | -28.04 | -27.81 |
| 3200 | -0.24 | -31.74 | -31.63 | 6.00 | -34.30 | -34.15 | -28.01 | -27.80 |
| 3300 | -0.24 | -38.56 | -38.44 | 0.97 | -32.94 | -32.46 | -28.18 | -27.87 |

# Bi-Directional Coupler

## BDCH-20-272+

### Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.02 | -41.83 | -41.82 | 36.78 | -40.77 | -40.70 | -39.61 | -39.82 |
| 100 | -0.03 | -35.86 | -35.85 | 33.47 | -35.69 | -35.46 | -34.84 | -35.02 |
| 200 | -0.04 | -29.99 | -29.99 | 29.85 | -30.85 | -30.96 | -30.10 | -30.09 |
| 300 | -0.05 | -26.69 | -26.69 | 27.48 | -28.60 | -28.64 | -28.00 | -27.90 |
| 400 | -0.06 | -24.49 | -24.50 | 25.95 | -27.67 | -27.57 | -27.13 | -26.94 |
| 500 | -0.07 | -22.92 | -22.95 | 24.92 | -27.72 | -27.69 | -27.19 | -26.91 |
| 600 | -0.08 | -21.79 | -21.82 | 24.06 | -28.48 | -28.40 | -28.05 | -27.70 |
| 700 | -0.08 | -20.98 | -21.02 | 23.51 | -30.58 | -30.43 | -30.30 | -29.82 |
| 800 | -0.09 | -20.43 | -20.47 | 22.94 | -34.11 | -33.88 | -34.47 | -33.41 |
| 900 | -0.10 | -20.10 | -20.14 | 22.42 | -41.42 | -41.18 | -42.32 | -39.88 |
| 1000 | -0.10 | -19.95 | -19.99 | 21.89 | -41.54 | -43.78 | -37.08 | -37.62 |
| 1100 | -0.11 | -19.95 | -20.00 | 21.63 | -34.37 | -35.24 | -31.10 | -31.68 |
| 1200 | -0.12 | -20.05 | -20.10 | 21.37 | -30.86 | -31.27 | -27.93 | -28.28 |
| 1300 | -0.13 | -20.25 | -20.31 | 21.41 | -28.65 | -28.97 | -25.94 | -26.26 |
| 1350 | -0.13 | -20.35 | -20.41 | 21.41 | -28.02 | -28.24 | -25.27 | -25.48 |
| 1400 | -0.13 | -20.45 | -20.52 | 21.44 | -27.59 | -27.64 | -24.97 | -25.11 |
| 1450 | -0.14 | -20.56 | -20.63 | 21.46 | -27.33 | -27.34 | -24.53 | -24.81 |
| 1500 | -0.14 | -20.66 | -20.73 | 21.52 | -27.32 | -27.37 | -24.44 | -24.67 |
| 1550 | -0.15 | -20.74 | -20.82 | 21.48 | -27.23 | -27.22 | -24.41 | -24.62 |
| 1600 | -0.15 | -20.80 | -20.89 | 21.61 | -27.55 | -27.55 | -24.59 | -24.74 |
| 1650 | -0.15 | -20.83 | -20.94 | 21.49 | -27.77 | -27.71 | -24.82 | -25.01 |
| 1700 | -0.15 | -20.83 | -20.96 | 21.39 | -28.27 | -28.31 | -25.18 | -25.42 |
| 1750 | -0.15 | -20.81 | -20.94 | 21.22 | -28.88 | -28.87 | -25.74 | -26.03 |
| 1800 | -0.15 | -20.76 | -20.90 | 21.10 | -29.63 | -29.71 | -26.51 | -26.83 |
| 1850 | -0.16 | -20.70 | -20.85 | 20.87 | -30.29 | -30.38 | -27.26 | -27.70 |
| 1900 | -0.16 | -20.62 | -20.78 | 20.58 | -31.33 | -31.71 | -28.32 | -28.86 |
| 1950 | -0.16 | -20.52 | -20.69 | 20.45 | -32.56 | -33.22 | -29.83 | -30.47 |
| 2000 | -0.16 | -20.44 | -20.59 | 20.30 | -33.62 | -34.60 | -31.45 | -32.11 |
| 2100 | -0.17 | -20.26 | -20.44 | 20.08 | -35.49 | -38.92 | -35.34 | -36.75 |
| 2200 | -0.17 | -20.13 | -20.32 | 19.61 | -35.55 | -44.03 | -37.41 | -38.81 |
| 2300 | -0.18 | -20.12 | -20.31 | 19.32 | -35.34 | -43.33 | -34.91 | -34.69 |
| 2400 | -0.19 | -20.22 | -20.40 | 18.93 | -33.79 | -39.90 | -31.33 | -31.16 |
| 2500 | -0.19 | -20.50 | -20.67 | 18.68 | -33.55 | -37.97 | -29.61 | -29.36 |
| 2600 | -0.19 | -20.93 | -21.09 | 18.29 | -33.57 | -37.10 | -28.24 | -28.01 |
| 2700 | -0.20 | -21.64 | -21.76 | 17.64 | -33.74 | -36.11 | -27.69 | -27.52 |
| 2800 | -0.20 | -22.53 | -22.65 | 16.79 | -34.77 | -35.82 | -27.33 | -27.26 |
| 2900 | -0.21 | -23.84 | -23.94 | 15.43 | -35.07 | -35.72 | -27.45 | -27.54 |
| 3000 | -0.22 | -25.66 | -25.66 | 13.29 | -35.77 | -35.53 | -27.60 | -27.67 |
| 3100 | -0.23 | -27.99 | -28.06 | 11.14 | -35.22 | -34.81 | -27.81 | -28.04 |
| 3200 | -0.23 | -31.63 | -31.74 | 7.27 | -34.15 | -34.30 | -27.80 | -28.01 |
| 3300 | -0.23 | -38.44 | -38.56 | 0.54 | -32.46 | -32.94 | -27.87 | -28.18 |

Surface Mount

# Bi-Directional Coupler

## BDCH-20-272+

### Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.02 | -41.82 | -41.82 | 36.40 | -39.61 | -39.82 | -40.77 | -40.70 |
| 100 | -0.03 | -35.85 | -35.85 | 33.68 | -34.84 | -35.02 | -35.69 | -35.46 |
| 200 | -0.04 | -29.98 | -30.00 | 29.66 | -30.10 | -30.09 | -30.85 | -30.96 |
| 300 | -0.06 | -26.69 | -26.70 | 27.36 | -28.00 | -27.90 | -28.60 | -28.64 |
| 400 | -0.07 | -24.49 | -24.51 | 25.92 | -27.13 | -26.94 | -27.67 | -27.57 |
| 500 | -0.08 | -22.92 | -22.95 | 25.12 | -27.19 | -26.91 | -27.72 | -27.69 |
| 600 | -0.08 | -21.79 | -21.83 | 24.46 | -28.05 | -27.70 | -28.48 | -28.40 |
| 700 | -0.09 | -20.98 | -21.03 | 24.10 | -30.30 | -29.82 | -30.58 | -30.43 |
| 800 | -0.09 | -20.43 | -20.48 | 23.59 | -34.47 | -33.41 | -34.11 | -33.88 |
| 900 | -0.09 | -20.11 | -20.15 | 23.08 | -42.32 | -39.88 | -41.42 | -41.18 |
| 1000 | -0.10 | -19.95 | -20.00 | 22.52 | -37.08 | -37.62 | -41.54 | -43.78 |
| 1100 | -0.11 | -19.95 | -20.01 | 22.18 | -31.10 | -31.68 | -34.37 | -35.24 |
| 1200 | -0.12 | -20.05 | -20.11 | 21.98 | -27.93 | -28.28 | -30.86 | -31.27 |
| 1300 | -0.13 | -20.24 | -20.31 | 22.12 | -25.94 | -26.26 | -28.65 | -28.97 |
| 1350 | -0.14 | -20.34 | -20.42 | 22.29 | -25.27 | -25.48 | -28.02 | -28.24 |
| 1400 | -0.14 | -20.44 | -20.52 | 22.39 | -24.97 | -25.11 | -27.59 | -27.64 |
| 1450 | -0.14 | -20.56 | -20.64 | 22.64 | -24.53 | -24.81 | -27.33 | -27.34 |
| 1500 | -0.15 | -20.66 | -20.74 | 22.81 | -24.44 | -24.67 | -27.32 | -27.37 |
| 1550 | -0.15 | -20.74 | -20.83 | 23.15 | -24.41 | -24.62 | -27.23 | -27.22 |
| 1600 | -0.15 | -20.79 | -20.90 | 23.40 | -24.59 | -24.74 | -27.55 | -27.55 |
| 1650 | -0.15 | -20.82 | -20.95 | 23.40 | -24.82 | -25.01 | -27.77 | -27.71 |
| 1700 | -0.16 | -20.82 | -20.97 | 23.13 | -25.18 | -25.42 | -28.27 | -28.31 |
| 1750 | -0.16 | -20.80 | -20.95 | 22.95 | -25.74 | -26.03 | -28.88 | -28.87 |
| 1800 | -0.16 | -20.75 | -20.91 | 22.53 | -26.51 | -26.83 | -29.63 | -29.71 |
| 1850 | -0.16 | -20.69 | -20.86 | 22.24 | -27.26 | -27.70 | -30.29 | -30.38 |
| 1900 | -0.16 | -20.62 | -20.79 | 21.82 | -28.32 | -28.86 | -31.33 | -31.71 |
| 1950 | -0.16 | -20.53 | -20.70 | 21.44 | -29.83 | -30.47 | -32.56 | -33.22 |
| 2000 | -0.16 | -20.43 | -20.60 | 21.08 | -31.45 | -32.11 | -33.62 | -34.60 |
| 2100 | -0.17 | -20.26 | -20.45 | 20.49 | -35.34 | -36.75 | -35.49 | -38.92 |
| 2200 | -0.17 | -20.14 | -20.32 | 19.63 | -37.41 | -38.81 | -35.55 | -44.03 |
| 2300 | -0.18 | -20.12 | -20.32 | 19.00 | -34.91 | -34.69 | -35.34 | -43.33 |
| 2400 | -0.18 | -20.23 | -20.41 | 18.17 | -31.33 | -31.16 | -33.79 | -39.90 |
| 2500 | -0.20 | -20.50 | -20.68 | 17.38 | -29.61 | -29.36 | -33.55 | -37.97 |
| 2600 | -0.20 | -20.95 | -21.09 | 16.73 | -28.24 | -28.01 | -33.57 | -37.10 |
| 2700 | -0.20 | -21.64 | -21.77 | 15.82 | -27.69 | -27.52 | -33.74 | -36.11 |
| 2800 | -0.21 | -22.54 | -22.65 | 14.97 | -27.33 | -27.26 | -34.77 | -35.82 |
| 2900 | -0.22 | -23.84 | -23.95 | 13.66 | -27.45 | -27.54 | -35.07 | -35.72 |
| 3000 | -0.23 | -25.66 | -25.67 | 11.77 | -27.60 | -27.67 | -35.77 | -35.53 |
| 3100 | -0.23 | -27.99 | -28.07 | 9.68 | -27.81 | -28.04 | -35.22 | -34.81 |
| 3200 | -0.24 | -31.64 | -31.75 | 6.09 | -27.80 | -28.01 | -34.15 | -34.30 |
| 3300 | -0.24 | -38.46 | -38.62 | 0.79 | -27.87 | -28.18 | -32.46 | -32.94 |

Surface Mount

# Bi-Directional Coupler

## BDCH-20-272+

### Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.82 | -41.82 | 36.63 | -39.82 | -39.61 | -40.70 | -40.77 |
| 100 | -0.04 | -35.85 | -35.85 | 33.20 | -35.02 | -34.84 | -35.46 | -35.69 |
| 200 | -0.05 | -30.00 | -29.98 | 29.51 | -30.09 | -30.10 | -30.96 | -30.85 |
| 300 | -0.07 | -26.70 | -26.69 | 27.03 | -27.90 | -28.00 | -28.64 | -28.60 |
| 400 | -0.07 | -24.51 | -24.49 | 25.27 | -26.94 | -27.13 | -27.57 | -27.67 |
| 500 | -0.08 | -22.95 | -22.92 | 24.23 | -26.91 | -27.19 | -27.69 | -27.72 |
| 600 | -0.08 | -21.83 | -21.79 | 23.38 | -27.70 | -28.05 | -28.40 | -28.48 |
| 700 | -0.09 | -21.03 | -20.98 | 23.08 | -29.82 | -30.30 | -30.43 | -30.58 |
| 800 | -0.09 | -20.48 | -20.43 | 22.75 | -33.41 | -34.47 | -33.88 | -34.11 |
| 900 | -0.10 | -20.15 | -20.11 | 22.54 | -39.88 | -42.32 | -41.18 | -41.42 |
| 1000 | -0.11 | -20.00 | -19.95 | 22.38 | -37.62 | -37.08 | -43.78 | -41.54 |
| 1100 | -0.11 | -20.01 | -19.95 | 22.30 | -31.68 | -31.10 | -35.24 | -34.37 |
| 1200 | -0.13 | -20.11 | -20.05 | 22.23 | -28.28 | -27.93 | -31.27 | -30.86 |
| 1300 | -0.13 | -20.31 | -20.24 | 22.25 | -26.26 | -25.94 | -28.97 | -28.65 |
| 1350 | -0.14 | -20.42 | -20.34 | 22.18 | -25.48 | -25.27 | -28.24 | -28.02 |
| 1400 | -0.15 | -20.52 | -20.44 | 22.15 | -25.11 | -24.97 | -27.64 | -27.59 |
| 1450 | -0.15 | -20.64 | -20.56 | 22.07 | -24.81 | -24.53 | -27.34 | -27.33 |
| 1500 | -0.15 | -20.74 | -20.66 | 22.02 | -24.67 | -24.44 | -27.37 | -27.32 |
| 1550 | -0.16 | -20.83 | -20.74 | 21.79 | -24.62 | -24.41 | -27.22 | -27.23 |
| 1600 | -0.16 | -20.90 | -20.79 | 21.72 | -24.74 | -24.59 | -27.55 | -27.55 |
| 1650 | -0.16 | -20.95 | -20.82 | 21.45 | -25.01 | -24.82 | -27.71 | -27.77 |
| 1700 | -0.16 | -20.97 | -20.82 | 21.15 | -25.42 | -25.18 | -28.31 | -28.27 |
| 1750 | -0.16 | -20.95 | -20.80 | 20.73 | -26.03 | -25.74 | -28.87 | -28.88 |
| 1800 | -0.17 | -20.91 | -20.75 | 20.41 | -26.83 | -26.51 | -29.71 | -29.63 |
| 1850 | -0.17 | -20.86 | -20.69 | 20.03 | -27.70 | -27.26 | -30.38 | -30.29 |
| 1900 | -0.17 | -20.79 | -20.62 | 19.69 | -28.86 | -28.32 | -31.71 | -31.33 |
| 1950 | -0.16 | -20.70 | -20.53 | 19.36 | -30.47 | -29.83 | -33.22 | -32.56 |
| 2000 | -0.17 | -20.60 | -20.43 | 19.21 | -32.11 | -31.45 | -34.60 | -33.62 |
| 2100 | -0.17 | -20.45 | -20.26 | 18.86 | -36.75 | -35.34 | -38.92 | -35.49 |
| 2200 | -0.17 | -20.32 | -20.14 | 18.52 | -38.81 | -37.41 | -44.03 | -35.55 |
| 2300 | -0.19 | -20.32 | -20.12 | 18.27 | -34.69 | -34.91 | -43.33 | -35.34 |
| 2400 | -0.18 | -20.41 | -20.23 | 18.15 | -31.16 | -31.33 | -39.90 | -33.79 |
| 2500 | -0.20 | -20.68 | -20.50 | 17.99 | -29.36 | -29.61 | -37.97 | -33.55 |
| 2600 | -0.20 | -21.09 | -20.95 | 17.82 | -28.01 | -28.24 | -37.10 | -33.57 |
| 2700 | -0.21 | -21.77 | -21.64 | 17.31 | -27.52 | -27.69 | -36.11 | -33.74 |
| 2800 | -0.21 | -22.65 | -22.54 | 16.56 | -27.26 | -27.33 | -35.82 | -34.77 |
| 2900 | -0.23 | -23.95 | -23.84 | 15.28 | -27.54 | -27.45 | -35.72 | -35.07 |
| 3000 | -0.23 | -25.67 | -25.66 | 13.28 | -27.67 | -27.60 | -35.53 | -35.77 |
| 3100 | -0.23 | -28.07 | -27.99 | 11.06 | -28.04 | -27.81 | -34.81 | -35.22 |
| 3200 | -0.25 | -31.75 | -31.64 | 7.16 | -28.01 | -27.80 | -34.30 | -34.15 |
| 3300 | -0.24 | -38.62 | -38.46 | 0.50 | -28.18 | -27.87 | -32.94 | -32.46 |

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.77 | -41.78 | 33.51 | -35.59 | -35.66 | -34.45 | -34.34 |
| 100 | -0.04 | -35.81 | -35.81 | 31.23 | -32.41 | -32.53 | -32.23 | -32.22 |
| 200 | -0.05 | -29.95 | -29.94 | 32.03 | -34.71 | -34.67 | -35.94 | -36.13 |
| 300 | -0.07 | -26.66 | -26.65 | 31.62 | -34.34 | -34.54 | -32.60 | -32.84 |
| 400 | -0.08 | -24.48 | -24.46 | 28.48 | -30.30 | -30.50 | -28.54 | -28.86 |
| 500 | -0.09 | -22.93 | -22.90 | 26.33 | -28.64 | -28.79 | -27.77 | -28.15 |
| 600 | -0.10 | -21.81 | -21.77 | 25.26 | -28.60 | -28.72 | -28.16 | -28.57 |
| 700 | -0.10 | -21.02 | -20.97 | 24.58 | -29.29 | -29.41 | -28.51 | -28.93 |
| 800 | -0.11 | -20.46 | -20.41 | 23.73 | -30.59 | -30.70 | -29.81 | -30.48 |
| 900 | -0.12 | -20.15 | -20.09 | 23.30 | -32.82 | -33.10 | -32.94 | -34.08 |
| 1000 | -0.12 | -20.00 | -19.94 | 22.77 | -37.93 | -38.02 | -38.48 | -40.67 |
| 1100 | -0.13 | -20.00 | -19.94 | 22.25 | -45.40 | -44.80 | -38.43 | -38.54 |
| 1200 | -0.14 | -20.11 | -20.04 | 22.16 | -37.07 | -36.50 | -31.85 | -31.46 |
| 1300 | -0.14 | -20.32 | -20.27 | 22.37 | -31.57 | -31.16 | -27.92 | -27.60 |
| 1350 | -0.15 | -20.43 | -20.36 | 22.30 | -29.65 | -29.37 | -26.34 | -26.16 |
| 1400 | -0.16 | -20.55 | -20.46 | 22.41 | -28.17 | -28.06 | -25.41 | -25.26 |
| 1450 | -0.16 | -20.67 | -20.57 | 22.54 | -27.20 | -27.11 | -24.60 | -24.34 |
| 1500 | -0.17 | -20.77 | -20.68 | 22.51 | -26.63 | -26.48 | -24.04 | -23.85 |
| 1550 | -0.17 | -20.86 | -20.79 | 23.04 | -25.97 | -25.97 | -23.76 | -23.52 |
| 1600 | -0.18 | -20.93 | -20.81 | 22.95 | -25.74 | -25.70 | -23.49 | -23.36 |
| 1650 | -0.17 | -20.98 | -20.84 | 22.63 | -25.53 | -25.51 | -23.47 | -23.28 |
| 1700 | -0.18 | -21.00 | -20.85 | 22.27 | -25.72 | -25.61 | -23.63 | -23.43 |
| 1750 | -0.19 | -20.99 | -20.84 | 21.73 | -25.94 | -25.89 | -24.07 | -23.84 |
| 1800 | -0.19 | -20.95 | -20.79 | 21.39 | -26.53 | -26.44 | -24.69 | -24.41 |
| 1850 | -0.19 | -20.88 | -20.72 | 20.79 | -27.09 | -26.91 | -25.46 | -25.12 |
| 1900 | -0.19 | -20.81 | -20.65 | 20.14 | -27.98 | -27.76 | -26.40 | -26.00 |
| 1950 | -0.19 | -20.74 | -20.56 | 19.45 | -29.33 | -28.94 | -27.89 | -27.37 |
| 2000 | -0.19 | -20.65 | -20.46 | 18.82 | -30.70 | -30.31 | -29.47 | -28.88 |
| 2100 | -0.20 | -20.47 | -20.28 | 18.15 | -35.53 | -33.64 | -35.01 | -33.36 |
| 2200 | -0.20 | -20.37 | -20.15 | 17.69 | -44.35 | -35.85 | -41.64 | -37.80 |
| 2300 | -0.21 | -20.35 | -20.12 | 17.14 | -42.17 | -35.44 | -35.35 | -35.19 |
| 2400 | -0.21 | -20.43 | -20.22 | 16.75 | -36.65 | -32.64 | -30.74 | -30.90 |
| 2500 | -0.23 | -20.72 | -20.51 | 16.50 | -34.18 | -31.55 | -28.65 | -28.94 |
| 2600 | -0.23 | -21.14 | -20.96 | 16.20 | -33.34 | -30.67 | -27.14 | -27.43 |
| 2700 | -0.24 | -21.81 | -21.66 | 15.59 | -32.98 | -30.68 | -26.59 | -26.96 |
| 2800 | -0.26 | -22.69 | -22.57 | 15.08 | -33.28 | -31.38 | -26.22 | -26.50 |
| 2900 | -0.26 | -23.95 | -23.82 | 13.85 | -33.88 | -31.51 | -26.15 | -26.37 |
| 3000 | -0.27 | -25.59 | -25.55 | 12.25 | -34.43 | -32.17 | -26.00 | -26.28 |
| 3100 | -0.26 | -28.23 | -28.05 | 9.43 | -34.51 | -32.11 | -25.98 | -26.37 |
| 3200 | -0.28 | -31.67 | -31.61 | 5.79 | -33.35 | -32.27 | -26.01 | -26.26 |
| 3300 | -0.27 | -38.64 | -38.31 | 0.91 | -32.25 | -30.81 | -26.12 | -26.44 |

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-Circuits 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-Circuits' website at https://www.minicircuits.com/terms/viewterm.html

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.02 | -41.78 | -41.77 | 33.81 | -35.66 | -35.59 | -34.34 | -34.45 |
| 100 | -0.03 | -35.81 | -35.81 | 31.50 | -32.53 | -32.41 | -32.22 | -32.23 |
| 200 | -0.05 | -29.94 | -29.95 | 31.93 | -34.67 | -34.71 | -36.13 | -35.94 |
| 300 | -0.06 | -26.65 | -26.66 | 32.03 | -34.54 | -34.34 | -32.84 | -32.60 |
| 400 | -0.07 | -24.46 | -24.48 | 28.49 | -30.50 | -30.30 | -28.86 | -28.54 |
| 500 | -0.08 | -22.90 | -22.93 | 26.43 | -28.79 | -28.64 | -28.15 | -27.77 |
| 600 | -0.09 | -21.77 | -21.81 | 25.43 | -28.72 | -28.60 | -28.57 | -28.16 |
| 700 | -0.10 | -20.97 | -21.02 | 24.59 | -29.41 | -29.29 | -28.93 | -28.51 |
| 800 | -0.10 | -20.41 | -20.46 | 23.37 | -30.70 | -30.59 | -30.48 | -29.81 |
| 900 | -0.11 | -20.09 | -20.15 | 22.59 | -33.10 | -32.82 | -34.08 | -32.94 |
| 1000 | -0.12 | -19.94 | -20.00 | 21.75 | -38.02 | -37.93 | -40.67 | -38.48 |
| 1100 | -0.13 | -19.94 | -20.00 | 21.00 | -44.80 | -45.40 | -38.54 | -38.43 |
| 1200 | -0.13 | -20.04 | -20.11 | 20.46 | -36.50 | -37.07 | -31.46 | -31.85 |
| 1300 | -0.14 | -20.27 | -20.32 | 20.54 | -31.16 | -31.57 | -27.60 | -27.92 |
| 1350 | -0.15 | -20.36 | -20.43 | 20.33 | -29.37 | -29.65 | -26.16 | -26.34 |
| 1400 | -0.15 | -20.46 | -20.55 | 20.45 | -28.06 | -28.17 | -25.26 | -25.41 |
| 1450 | -0.16 | -20.57 | -20.67 | 20.52 | -27.11 | -27.20 | -24.34 | -24.60 |
| 1500 | -0.16 | -20.68 | -20.77 | 20.43 | -26.48 | -26.63 | -23.85 | -24.04 |
| 1550 | -0.17 | -20.79 | -20.86 | 21.22 | -25.97 | -25.97 | -23.52 | -23.76 |
| 1600 | -0.17 | -20.81 | -20.93 | 21.12 | -25.70 | -25.74 | -23.36 | -23.49 |
| 1650 | -0.17 | -20.84 | -20.98 | 21.07 | -25.51 | -25.53 | -23.28 | -23.47 |
| 1700 | -0.18 | -20.85 | -21.00 | 20.89 | -25.61 | -25.72 | -23.43 | -23.63 |
| 1750 | -0.18 | -20.84 | -20.99 | 20.81 | -25.89 | -25.94 | -23.84 | -24.07 |
| 1800 | -0.18 | -20.79 | -20.95 | 20.74 | -26.44 | -26.53 | -24.41 | -24.69 |
| 1850 | -0.18 | -20.72 | -20.88 | 20.60 | -26.91 | -27.09 | -25.12 | -25.46 |
| 1900 | -0.19 | -20.65 | -20.81 | 20.21 | -27.76 | -27.98 | -26.00 | -26.40 |
| 1950 | -0.18 | -20.56 | -20.74 | 19.92 | -28.94 | -29.33 | -27.37 | -27.89 |
| 2000 | -0.19 | -20.46 | -20.65 | 19.39 | -30.31 | -30.70 | -28.88 | -29.47 |
| 2100 | -0.19 | -20.28 | -20.47 | 19.11 | -33.64 | -35.53 | -33.36 | -35.01 |
| 2200 | -0.20 | -20.15 | -20.37 | 18.71 | -35.85 | -44.35 | -37.80 | -41.64 |
| 2300 | -0.20 | -20.12 | -20.35 | 18.22 | -35.44 | -42.17 | -35.19 | -35.35 |
| 2400 | -0.21 | -20.22 | -20.43 | 17.85 | -32.64 | -36.65 | -30.90 | -30.74 |
| 2500 | -0.22 | -20.51 | -20.72 | 17.78 | -31.55 | -34.18 | -28.94 | -28.65 |
| 2600 | -0.22 | -20.96 | -21.14 | 17.49 | -30.67 | -33.34 | -27.43 | -27.14 |
| 2700 | -0.23 | -21.66 | -21.81 | 16.99 | -30.68 | -32.98 | -26.96 | -26.59 |
| 2800 | -0.24 | -22.57 | -22.69 | 16.25 | -31.38 | -33.28 | -26.50 | -26.22 |
| 2900 | -0.25 | -23.82 | -23.95 | 15.66 | -31.51 | -33.88 | -26.37 | -26.15 |
| 3000 | -0.25 | -25.55 | -25.59 | 14.01 | -32.17 | -34.43 | -26.28 | -26.00 |
| 3100 | -0.25 | -28.05 | -28.23 | 10.92 | -32.11 | -34.51 | -26.37 | -25.98 |
| 3200 | -0.27 | -31.61 | -31.67 | 7.40 | -32.27 | -33.35 | -26.26 | -26.01 |
| 3300 | -0.26 | -38.31 | -38.64 | 0.51 | -30.81 | -32.25 | -26.44 | -26.12 |

NOTES:
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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-Circuits 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-Circuits' website at https://www.minicircuits.com/terms/viewterm.html

Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.77 | -41.78 | 33.48 | -34.34 | -34.45 | -35.66 | -35.59 |
| 100 | -0.04 | -35.81 | -35.81 | 30.87 | -32.22 | -32.23 | -32.53 | -32.41 |
| 200 | -0.05 | -29.94 | -29.95 | 31.21 | -36.13 | -35.94 | -34.67 | -34.71 |
| 300 | -0.07 | -26.65 | -26.66 | 31.25 | -32.84 | -32.60 | -34.54 | -34.34 |
| 400 | -0.08 | -24.46 | -24.48 | 28.32 | -28.86 | -28.54 | -30.50 | -30.30 |
| 500 | -0.09 | -22.90 | -22.93 | 26.61 | -28.15 | -27.77 | -28.79 | -28.64 |
| 600 | -0.10 | -21.78 | -21.81 | 25.83 | -28.57 | -28.16 | -28.72 | -28.60 |
| 700 | -0.11 | -20.97 | -21.02 | 25.23 | -28.93 | -28.51 | -29.41 | -29.29 |
| 800 | -0.11 | -20.42 | -20.47 | 24.21 | -30.48 | -29.81 | -30.70 | -30.59 |
| 900 | -0.12 | -20.10 | -20.16 | 23.48 | -34.08 | -32.94 | -33.10 | -32.82 |
| 1000 | -0.13 | -19.94 | -20.00 | 22.55 | -40.67 | -38.48 | -38.02 | -37.93 |
| 1100 | -0.13 | -19.94 | -20.01 | 21.71 | -38.54 | -38.43 | -44.80 | -45.40 |
| 1200 | -0.15 | -20.04 | -20.11 | 21.24 | -31.46 | -31.85 | -36.50 | -37.07 |
| 1300 | -0.15 | -20.27 | -20.32 | 21.31 | -27.60 | -27.92 | -31.16 | -31.57 |
| 1350 | -0.16 | -20.36 | -20.43 | 21.32 | -26.16 | -26.34 | -29.37 | -29.65 |
| 1400 | -0.17 | -20.46 | -20.55 | 21.45 | -25.26 | -25.41 | -28.06 | -28.17 |
| 1450 | -0.17 | -20.57 | -20.67 | 21.75 | -24.34 | -24.60 | -27.11 | -27.20 |
| 1500 | -0.18 | -20.68 | -20.77 | 21.84 | -23.85 | -24.04 | -26.48 | -26.63 |
| 1550 | -0.19 | -20.78 | -20.87 | 22.48 | -23.52 | -23.76 | -25.97 | -25.97 |
| 1600 | -0.19 | -20.81 | -20.93 | 22.70 | -23.36 | -23.49 | -25.70 | -25.74 |
| 1650 | -0.18 | -20.84 | -20.98 | 22.69 | -23.28 | -23.47 | -25.51 | -25.53 |
| 1700 | -0.19 | -20.85 | -21.01 | 22.52 | -23.43 | -23.63 | -25.61 | -25.72 |
| 1750 | -0.20 | -20.84 | -20.99 | 22.25 | -23.84 | -24.07 | -25.89 | -25.94 |
| 1800 | -0.20 | -20.78 | -20.95 | 22.09 | -24.41 | -24.69 | -26.44 | -26.53 |
| 1850 | -0.19 | -20.72 | -20.88 | 21.75 | -25.12 | -25.46 | -26.91 | -27.09 |
| 1900 | -0.20 | -20.65 | -20.81 | 21.23 | -26.00 | -26.40 | -27.76 | -27.98 |
| 1950 | -0.19 | -20.56 | -20.74 | 20.68 | -27.37 | -27.89 | -28.94 | -29.33 |
| 2000 | -0.20 | -20.46 | -20.65 | 19.97 | -28.88 | -29.47 | -30.31 | -30.70 |
| 2100 | -0.20 | -20.28 | -20.47 | 19.43 | -33.36 | -35.01 | -33.64 | -35.53 |
| 2200 | -0.21 | -20.16 | -20.37 | 18.79 | -37.80 | -41.64 | -35.85 | -44.35 |
| 2300 | -0.21 | -20.13 | -20.35 | 18.08 | -35.19 | -35.35 | -35.44 | -42.17 |
| 2400 | -0.22 | -20.24 | -20.43 | 17.31 | -30.90 | -30.74 | -32.64 | -36.65 |
| 2500 | -0.24 | -20.51 | -20.71 | 16.84 | -28.94 | -28.65 | -31.55 | -34.18 |
| 2600 | -0.24 | -20.97 | -21.13 | 16.33 | -27.43 | -27.14 | -30.67 | -33.34 |
| 2700 | -0.25 | -21.66 | -21.80 | 15.54 | -26.96 | -26.59 | -30.68 | -32.98 |
| 2800 | -0.27 | -22.58 | -22.68 | 14.96 | -26.50 | -26.22 | -31.38 | -33.28 |
| 2900 | -0.28 | -23.83 | -23.94 | 13.75 | -26.37 | -26.15 | -31.51 | -33.88 |
| 3000 | -0.28 | -25.56 | -25.59 | 12.16 | -26.28 | -26.00 | -32.17 | -34.43 |
| 3100 | -0.27 | -28.05 | -28.23 | 9.53 | -26.37 | -25.98 | -32.11 | -34.51 |
| 3200 | -0.29 | -31.63 | -31.66 | 5.83 | -26.26 | -26.01 | -32.27 | -33.35 |
| 3300 | -0.28 | -38.31 | -38.64 | 0.57 | -26.44 | -26.12 | -30.81 | -32.25 |

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Surface Mount

# Bi-Directional Coupler

# BDCH-20-272+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 50 | -0.03 | -41.78 | -41.77 | 33.61 | -34.45 | -34.34 | -35.59 | -35.66 |
| 100 | -0.04 | -35.81 | -35.81 | 30.92 | -32.23 | -32.22 | -32.41 | -32.53 |
| 200 | -0.05 | -29.95 | -29.94 | 31.05 | -35.94 | -36.13 | -34.71 | -34.67 |
| 300 | -0.07 | -26.66 | -26.65 | 31.28 | -32.60 | -32.84 | -34.34 | -34.54 |
| 400 | -0.08 | -24.48 | -24.46 | 27.62 | -28.54 | -28.86 | -30.30 | -30.50 |
| 500 | -0.09 | -22.93 | -22.90 | 25.62 | -27.77 | -28.15 | -28.64 | -28.79 |
| 600 | -0.10 | -21.81 | -21.78 | 24.64 | -28.16 | -28.57 | -28.60 | -28.72 |
| 700 | -0.11 | -21.02 | -20.97 | 24.06 | -28.51 | -28.93 | -29.29 | -29.41 |
| 800 | -0.11 | -20.47 | -20.42 | 23.12 | -29.81 | -30.48 | -30.59 | -30.70 |
| 900 | -0.12 | -20.16 | -20.10 | 22.60 | -32.94 | -34.08 | -32.82 | -33.10 |
| 1000 | -0.12 | -20.00 | -19.94 | 22.13 | -38.48 | -40.67 | -37.93 | -38.02 |
| 1100 | -0.13 | -20.01 | -19.94 | 21.56 | -38.43 | -38.54 | -45.40 | -44.80 |
| 1200 | -0.14 | -20.11 | -20.04 | 21.20 | -31.85 | -31.46 | -37.07 | -36.50 |
| 1300 | -0.15 | -20.32 | -20.27 | 21.31 | -27.92 | -27.60 | -31.57 | -31.16 |
| 1350 | -0.16 | -20.43 | -20.36 | 21.01 | -26.34 | -26.16 | -29.65 | -29.37 |
| 1400 | -0.17 | -20.55 | -20.46 | 21.07 | -25.41 | -25.26 | -28.17 | -28.06 |
| 1450 | -0.17 | -20.67 | -20.57 | 21.03 | -24.60 | -24.34 | -27.20 | -27.11 |
| 1500 | -0.18 | -20.77 | -20.68 | 20.85 | -24.04 | -23.85 | -26.63 | -26.48 |
| 1550 | -0.19 | -20.87 | -20.78 | 21.52 | -23.76 | -23.52 | -25.97 | -25.97 |
| 1600 | -0.19 | -20.93 | -20.81 | 21.19 | -23.49 | -23.36 | -25.74 | -25.70 |
| 1650 | -0.18 | -20.98 | -20.84 | 20.99 | -23.47 | -23.28 | -25.53 | -25.51 |
| 1700 | -0.19 | -21.01 | -20.85 | 20.63 | -23.63 | -23.43 | -25.72 | -25.61 |
| 1750 | -0.20 | -20.99 | -20.84 | 20.32 | -24.07 | -23.84 | -25.94 | -25.89 |
| 1800 | -0.20 | -20.95 | -20.78 | 20.06 | -24.69 | -24.41 | -26.53 | -26.44 |
| 1850 | -0.20 | -20.88 | -20.72 | 19.80 | -25.46 | -25.12 | -27.09 | -26.91 |
| 1900 | -0.20 | -20.81 | -20.65 | 19.37 | -26.40 | -26.00 | -27.98 | -27.76 |
| 1950 | -0.19 | -20.74 | -20.56 | 18.92 | -27.89 | -27.37 | -29.33 | -28.94 |
| 2000 | -0.20 | -20.65 | -20.46 | 18.43 | -29.47 | -28.88 | -30.70 | -30.31 |
| 2100 | -0.20 | -20.47 | -20.28 | 18.05 | -35.01 | -33.36 | -35.53 | -33.64 |
| 2200 | -0.20 | -20.37 | -20.16 | 17.82 | -41.64 | -37.80 | -44.35 | -35.85 |
| 2300 | -0.21 | -20.35 | -20.13 | 17.40 | -35.35 | -35.19 | -42.17 | -35.44 |
| 2400 | -0.21 | -20.43 | -20.24 | 17.30 | -30.74 | -30.90 | -36.65 | -32.64 |
| 2500 | -0.24 | -20.71 | -20.51 | 17.30 | -28.65 | -28.94 | -34.18 | -31.55 |
| 2600 | -0.23 | -21.13 | -20.97 | 17.22 | -27.14 | -27.43 | -33.34 | -30.67 |
| 2700 | -0.25 | -21.80 | -21.66 | 16.85 | -26.59 | -26.96 | -32.98 | -30.68 |
| 2800 | -0.26 | -22.68 | -22.58 | 16.17 | -26.22 | -26.50 | -33.28 | -31.38 |
| 2900 | -0.28 | -23.94 | -23.83 | 15.61 | -26.15 | -26.37 | -33.88 | -31.51 |
| 3000 | -0.27 | -25.59 | -25.56 | 14.01 | -26.00 | -26.28 | -34.43 | -32.17 |
| 3100 | -0.27 | -28.23 | -28.05 | 10.76 | -25.98 | -26.37 | -34.51 | -32.11 |
| 3200 | -0.28 | -31.66 | -31.63 | 7.39 | -26.01 | -26.26 | -33.35 | -32.27 |
| 3300 | -0.28 | -38.64 | -38.31 | 0.45 | -26.12 | -26.44 | -32.25 | -30.81 |

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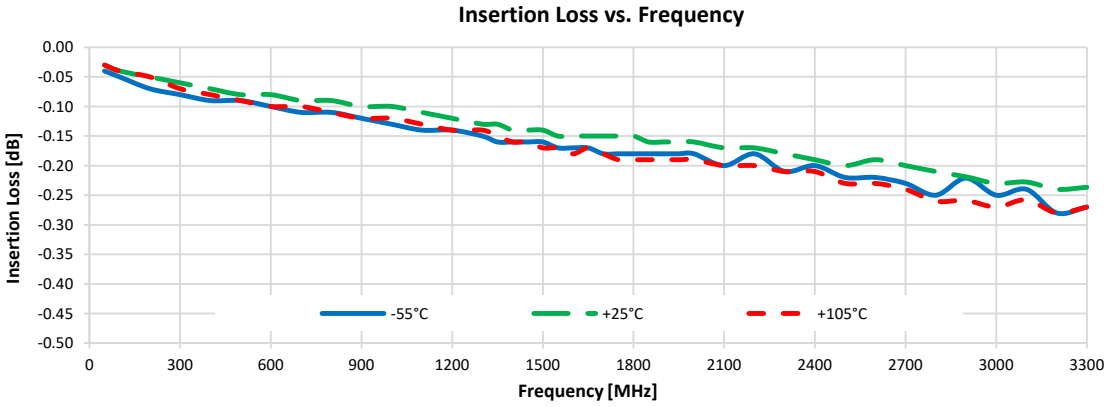
Surface Mount

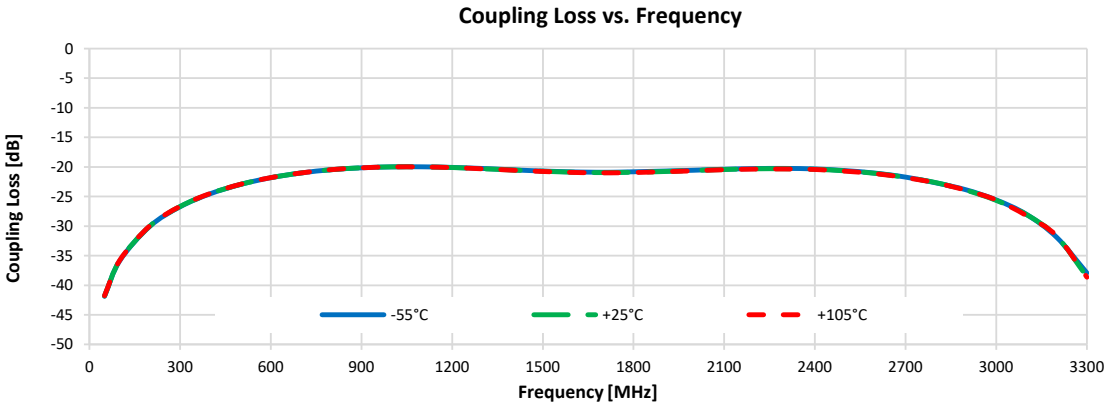
# Bi-Directional Coupler

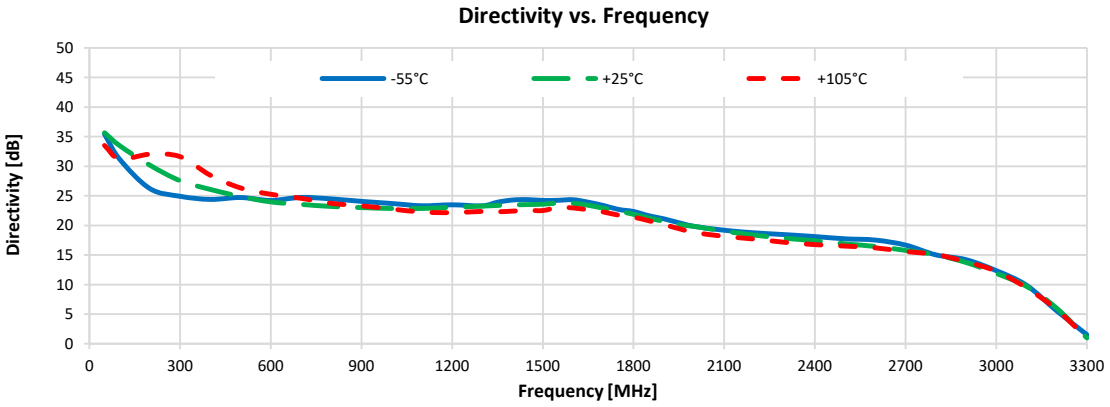
# BDCH-20-272+

## Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration A.



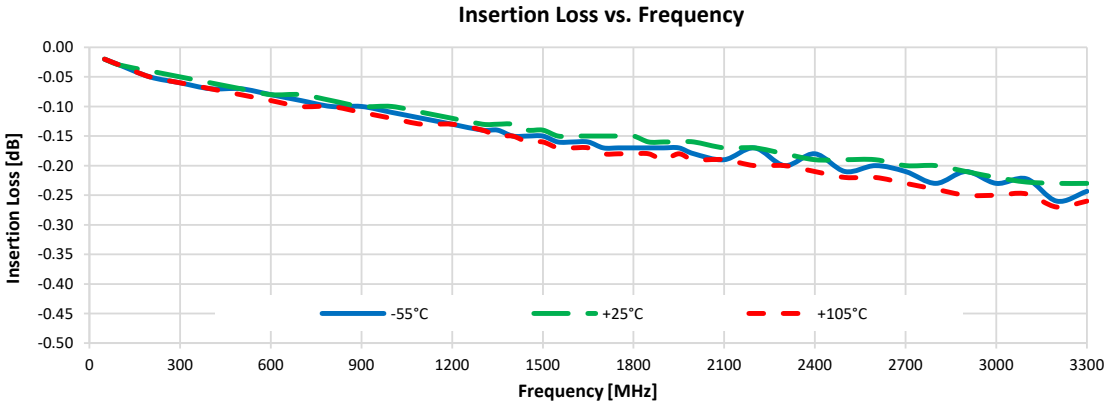



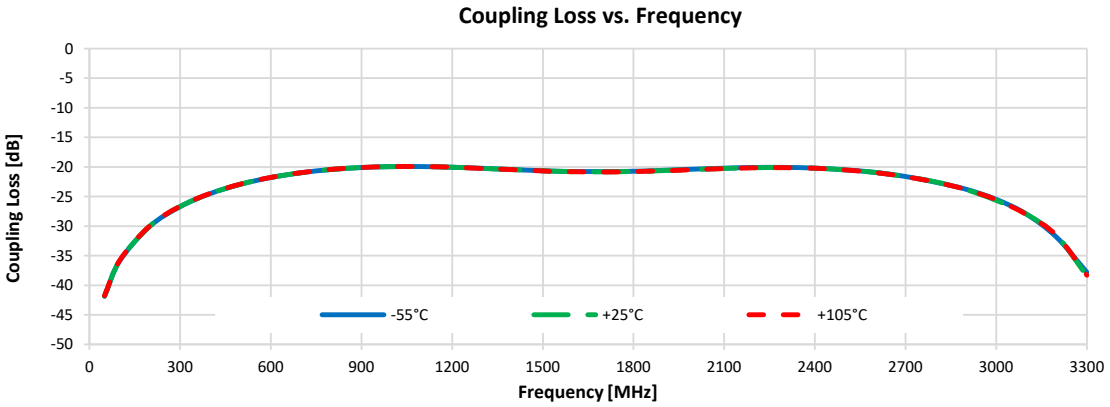
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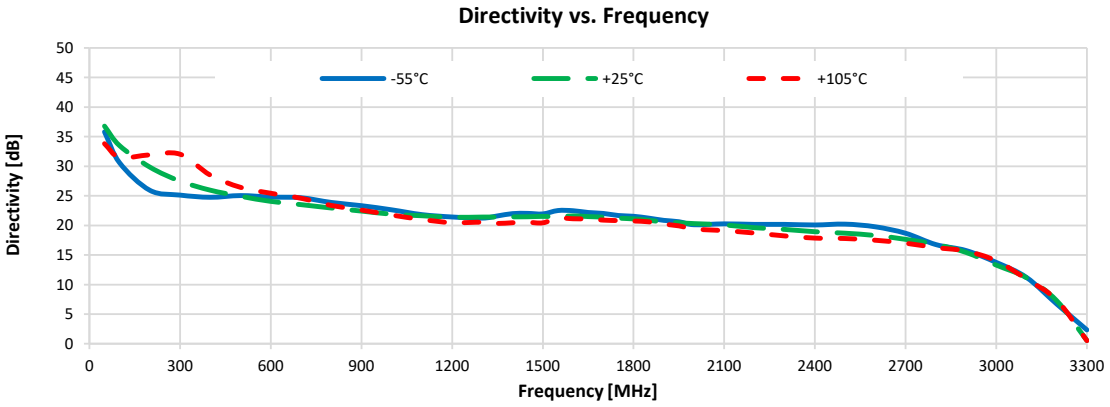
## BDCH-20-272+

### Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration B.



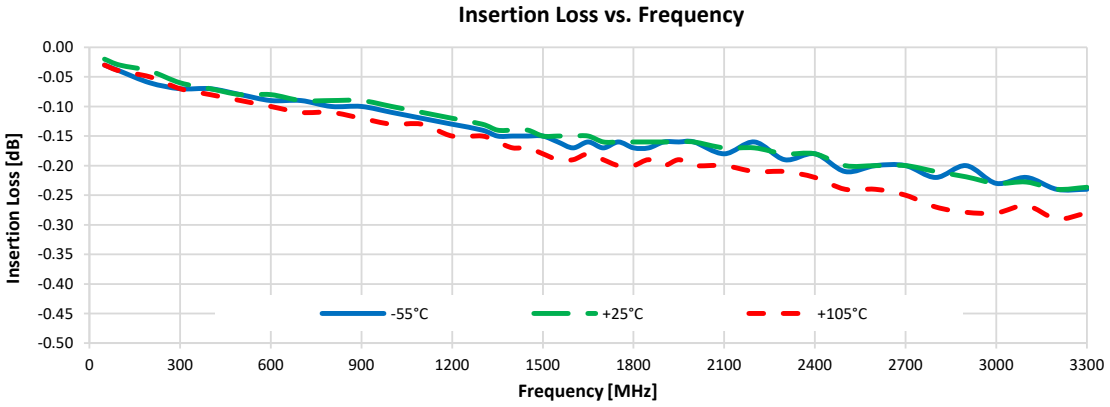



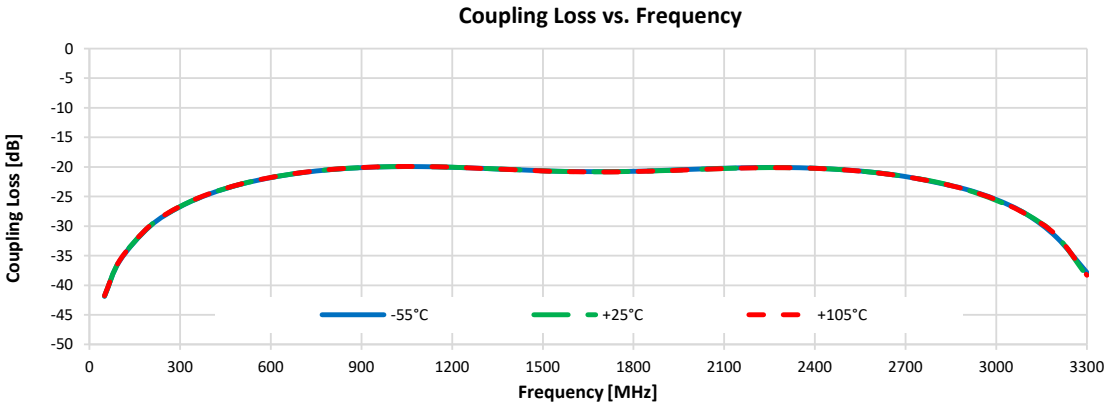
# Bi-Directional Coupler

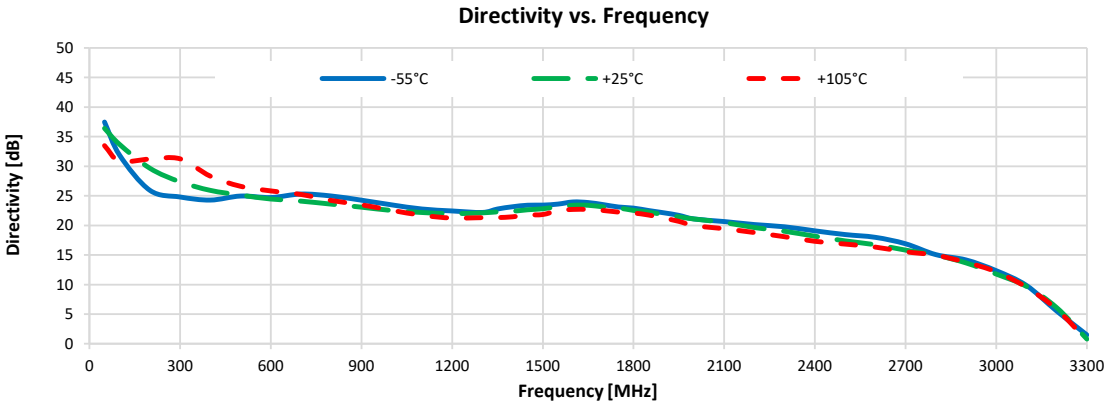
## BDCH-20-272+

### Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration C.



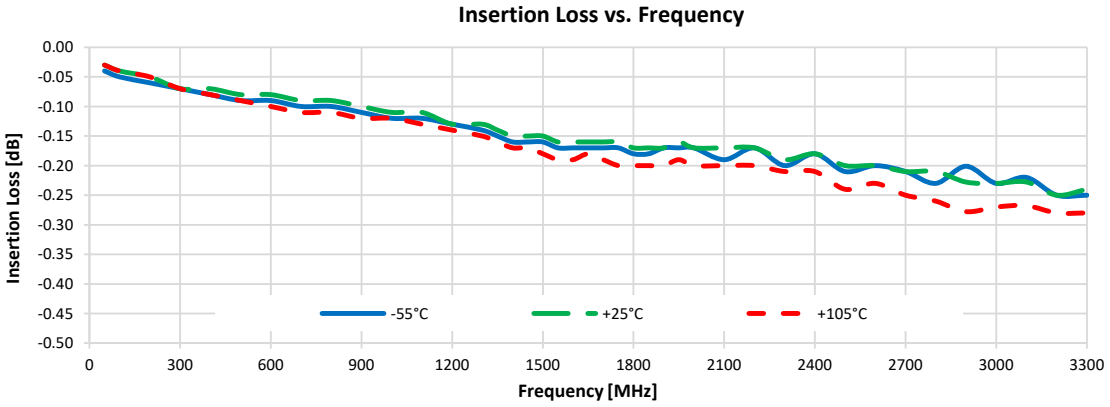



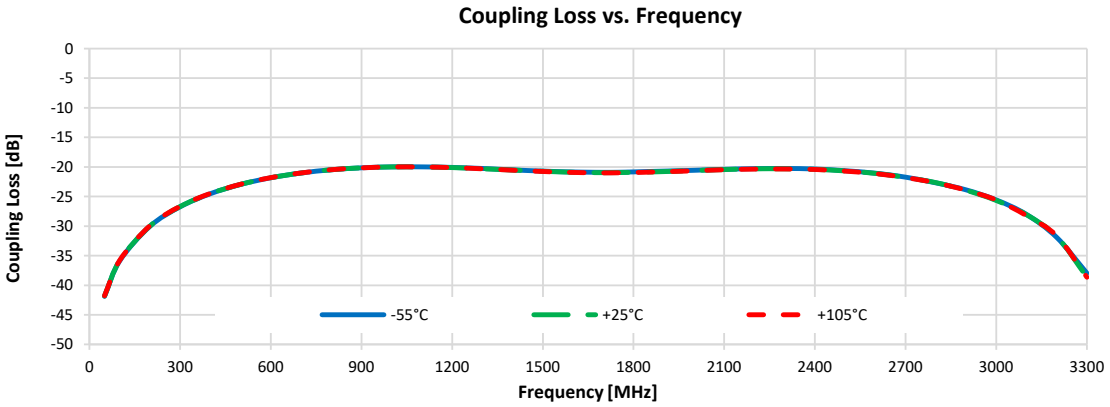
# Bi-Directional Coupler

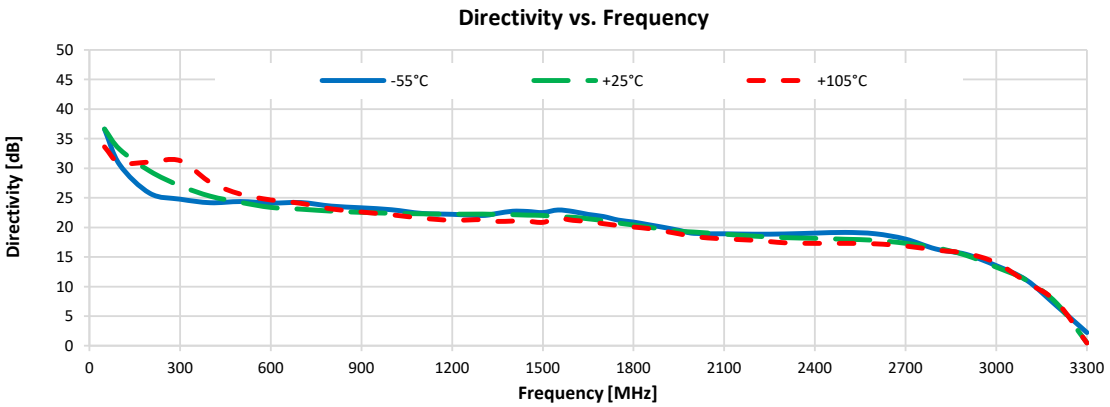
## BDCH-20-272+

### Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration D.



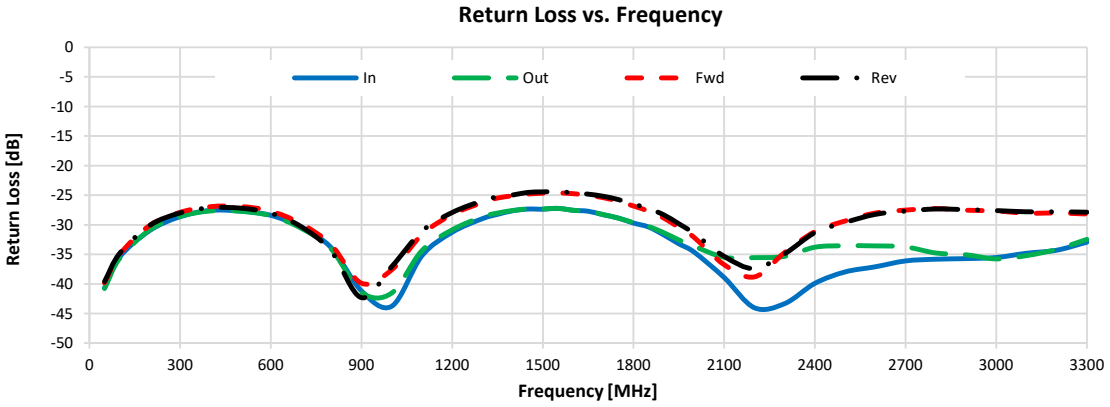



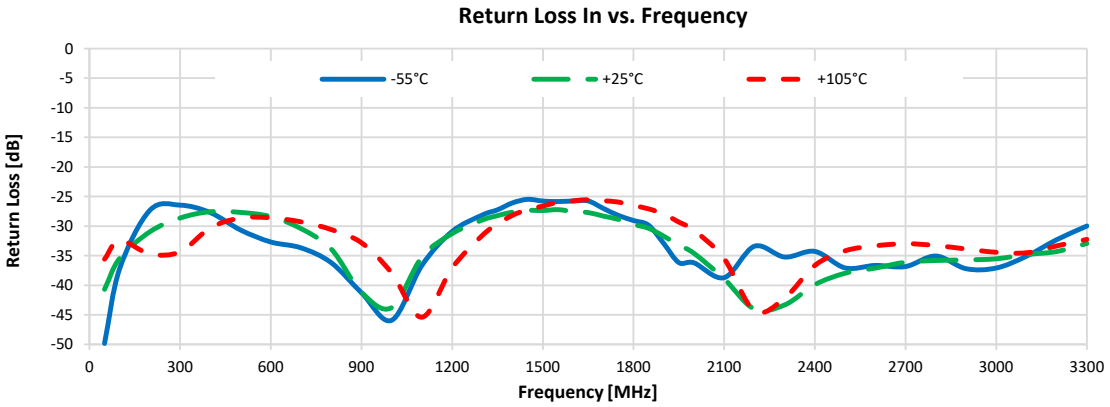



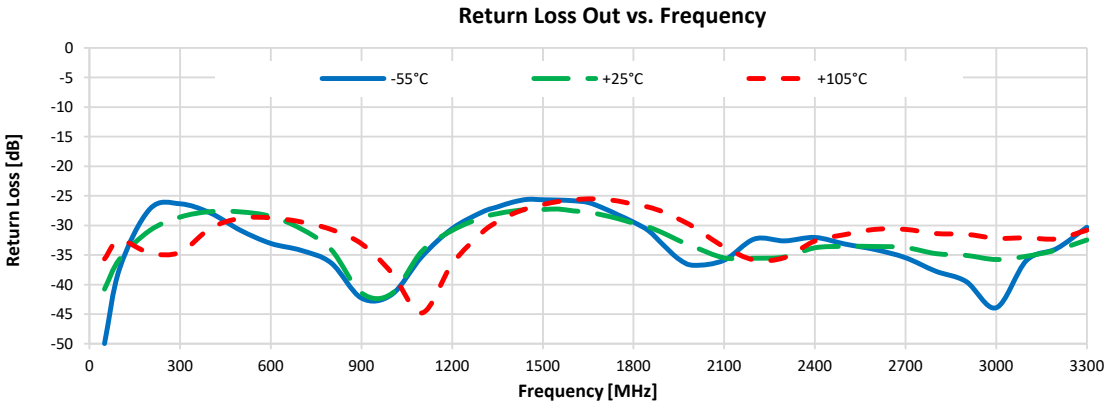
# Bi-Directional Coupler BDCH-20-272+

## Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration A.



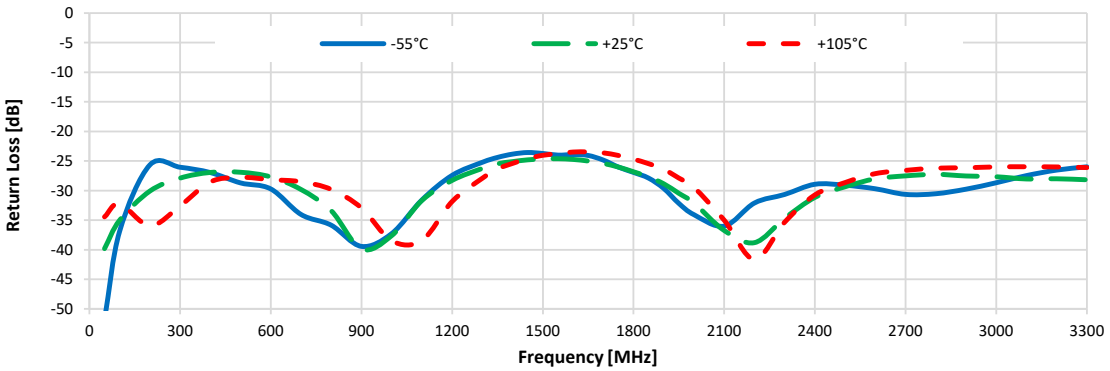

Return Loss Forward vs. Frequency

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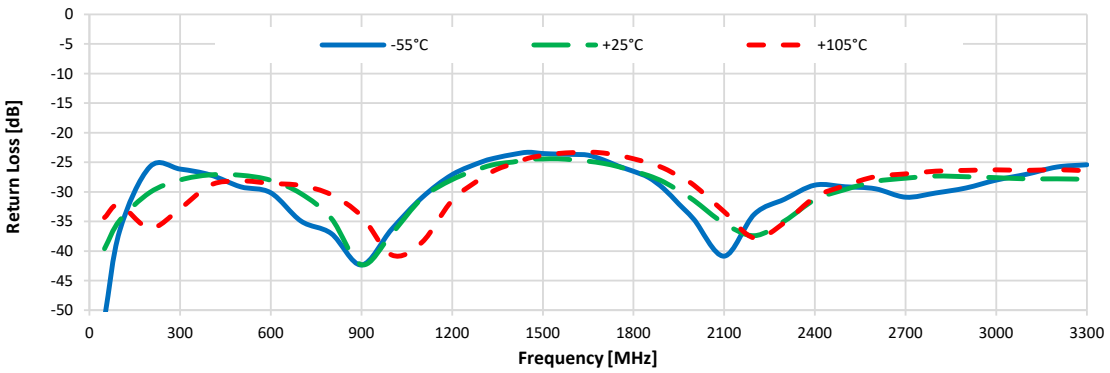
# Bi-Directional Coupler BDCH-20-272+

## Typical Performance Graphs

Test Conditions: Input Power = +5 dbm, Configuration A.




**Return Loss Reverse vs. Frequency**

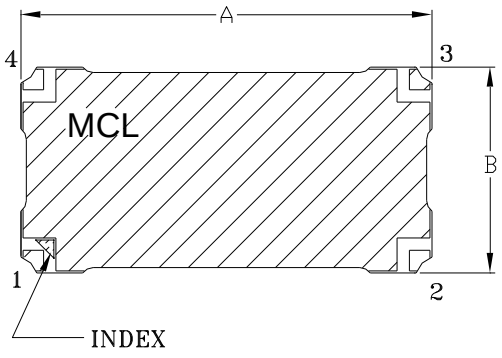


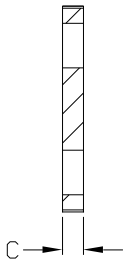

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# Case Style PQ

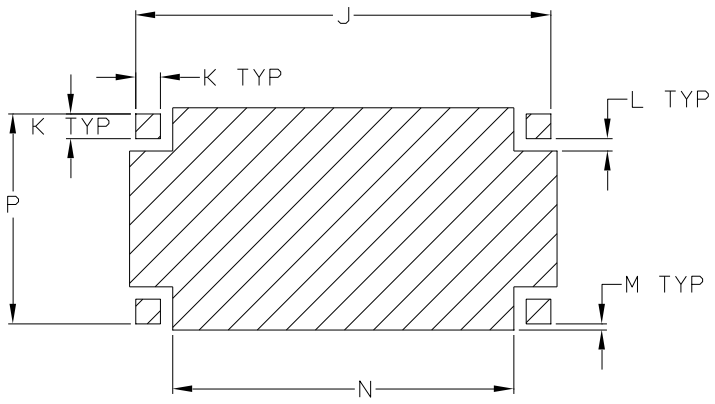
## Outline Dimensions PQ2098

TOP SIDE

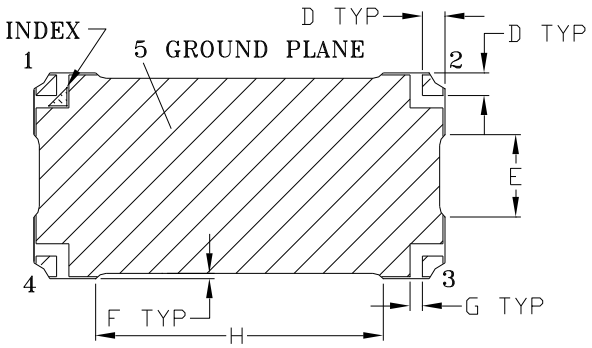



PCB LAND PATTERN




BOTTOM SIDE










| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N | P | WT. GRAMS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PQ2098 | 1.000 (25.40) | .500 (12.70) | .051 (1.30) | .055 (1.40) | .200 (5.08) | .013 (0.33) | .030 (0.76) | .700 (17.78) | 1.010 (25.65) | .060 (1.52) | .030 (0.76) | .015 (0.38) | .830 (21.08) | .510 (12.95) | 2.0 |

**Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .010**

**Notes:**

1. Base material: Printed wiring laminate.
2. Termination finish:
   For RoHS Cases, all models (+) suffix: 2-5 µinch (.05-.13 microns) Immersion Gold.
   For RoHS-5 Cases, all models no (+) suffix: Tin-Lead plate.

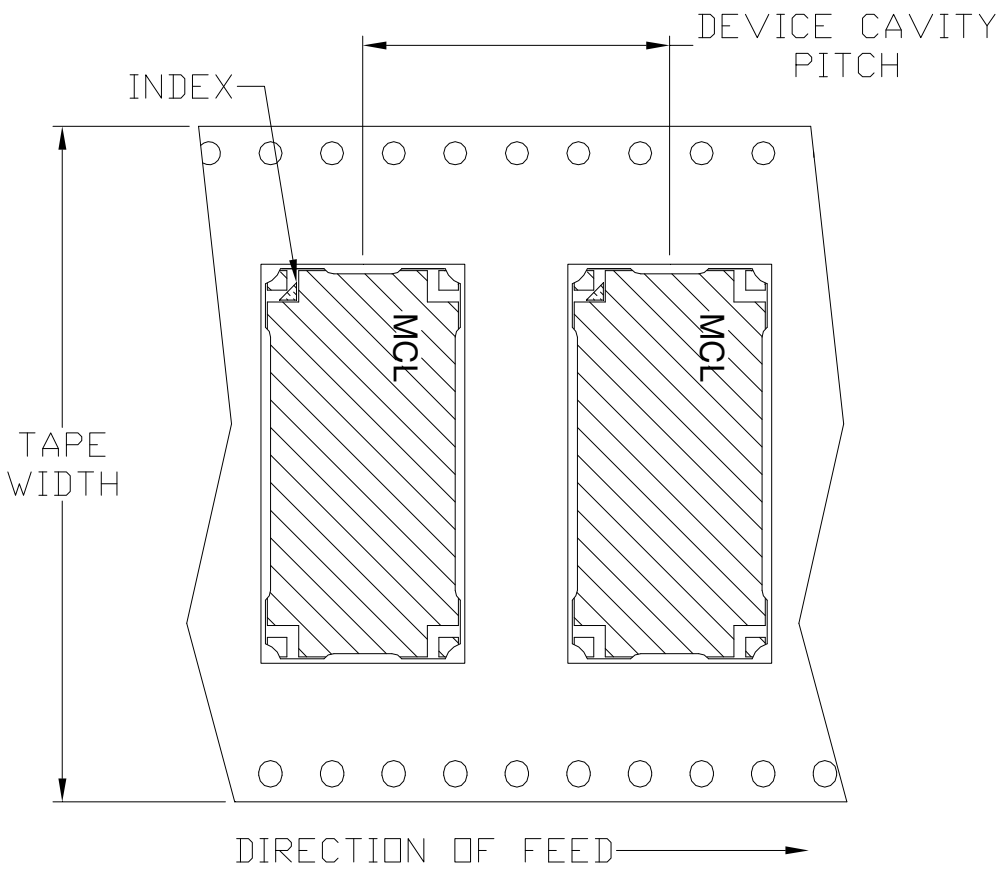

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# Tape & Reel Packaging TR-F118

DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel |
|---|---|---|---|
| 44 | 20 | 13 | 500 |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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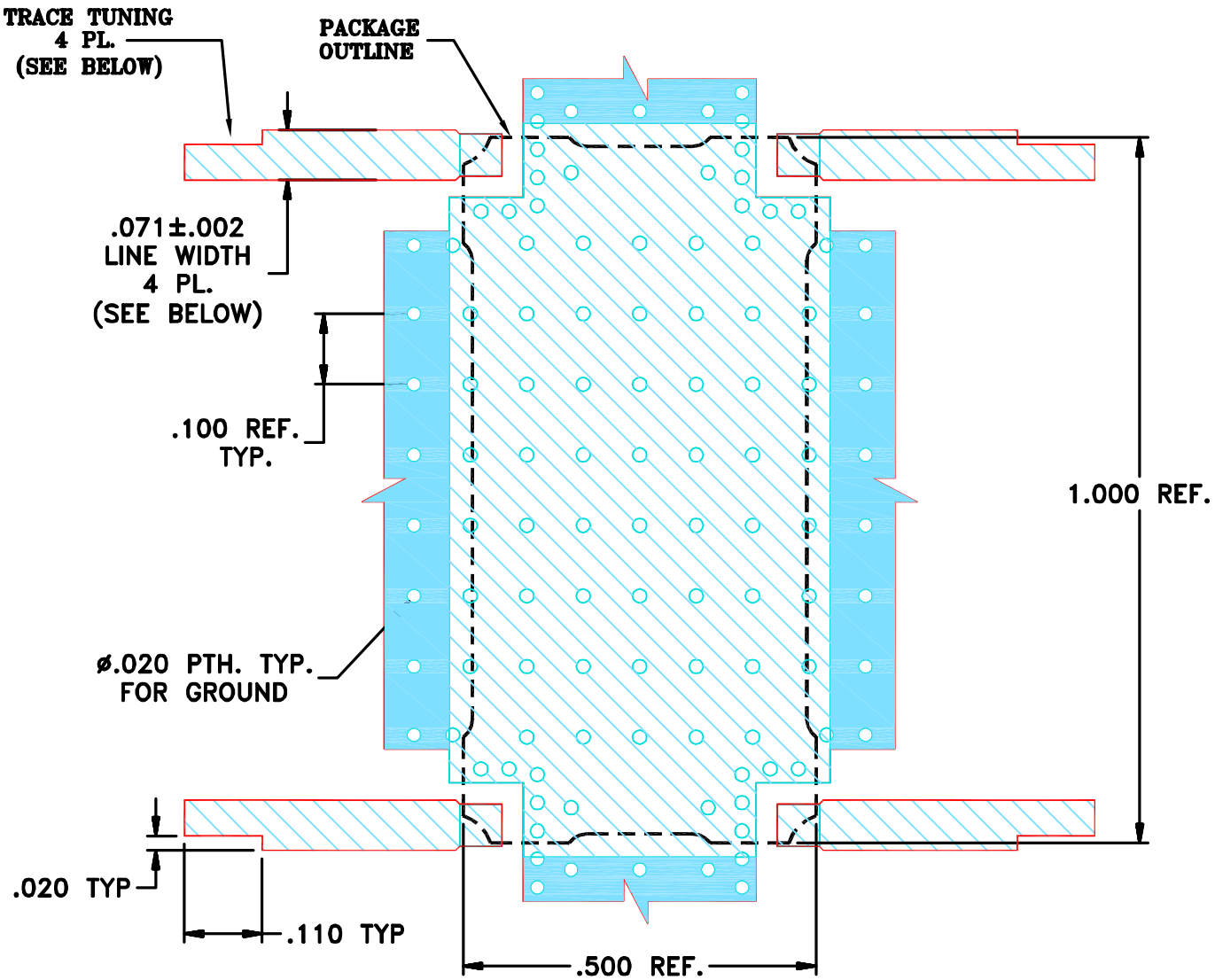

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THIRD ANGLE PROJECTION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | M165053 | NEW RELEASE | 12/17 | DK | HH |
| OR | R92774 | NEW RELEASE | 12/17 | DK | HH |
| | | | | | |
| | | | | | |

## SUGGESTED MOUNTING CONFIGURATION

FOR PQ2098 /2098-1/2098-2 CASE STYLES 04DC01 PIN CONNECTION, 50 OHM




**NOTES:**

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4003C WITH DIELECTRIC THICKNESS. 0.032"±.0015". COPPER: 1 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. TRACE TUNING IN RF LINES MAY BE NEEDED TO ACHIEVE SPECIFIED PERFORMANCE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | DK (RAVON) | 03 DEC 17 |
| TOLERANCES ON: | CHECKED | RM (RAVON) | 03 DEC 17 |
| 2 PL DECIMALS ± | APPROVED | HH (RAVON) | 03 DEC 17 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± 1° | | | |
| FRACTIONS ± | | | |

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ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

# PL FOR MBD PQ2098
# TB-863-1 (50Ω )

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-538 | OR |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL538(OR) | 4:1 | 1 OF 1 |

Mini-Circuits

**Environmental Specifications** **ENV02T8**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|---|---|---|
| Operating Temperature | -55° to 105° C<br>Case Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 105°C<br>Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 240 hours, 50°C | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat | Sn-Pb Eutectic Process 225°C peak<br>Pb-Free Process 245° - 250°C peak | J-STD-020C, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, Para 4.2.5, Test S, 95% Coverage |
| Vibration (high Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-883, Method 2007.3, Condition A |
| Mechanical Shock | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition A |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |


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