



Mini-Circuits

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

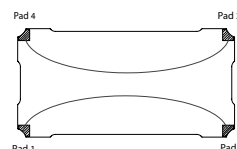
APPLICATIONS

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



Generic photo used for illustration purposes only

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 (°C) = (Hot Spot Temperature on DUT - Base Plate Temperature)/Input Power)

ABSOLUTE MAXIMUM RATINGS⁵

| | | |
|---|--------------|-------------------|
| 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.





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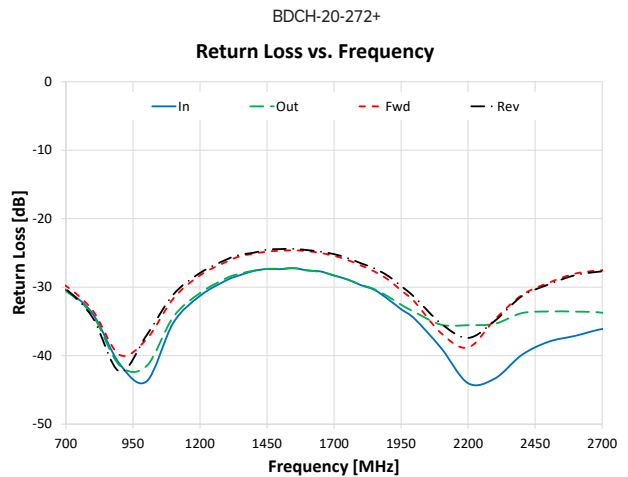
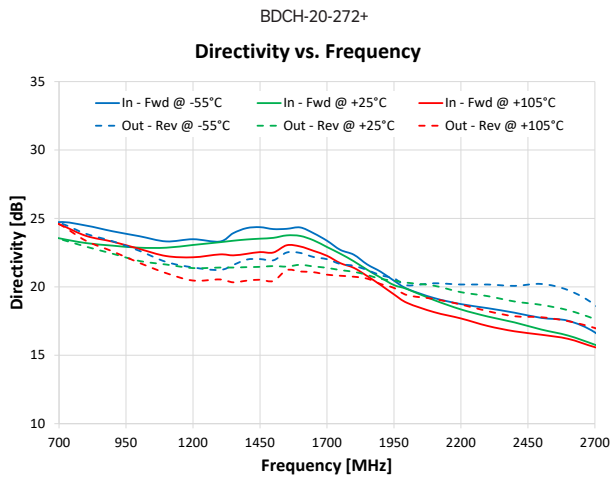
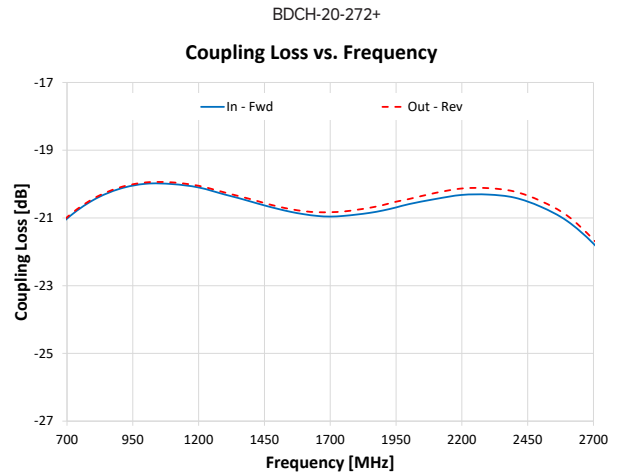
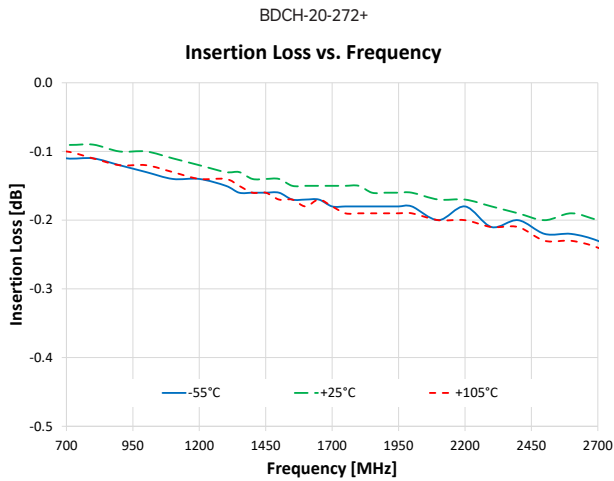
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TYPICAL PERFORMANCE GRAPHS

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





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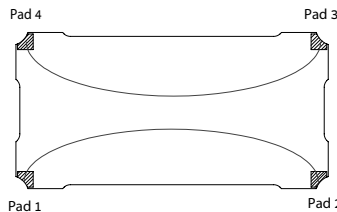


Figure 1. BDCH-20-272+ Functional Diagram

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)

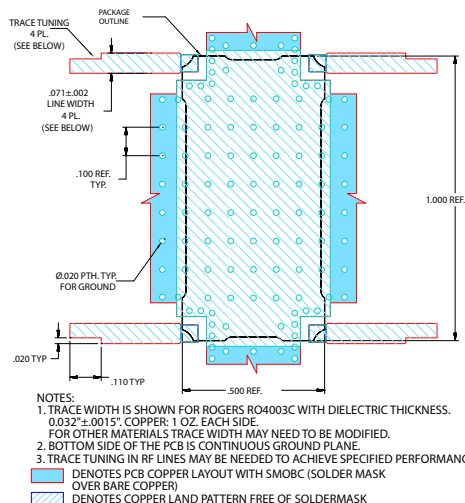
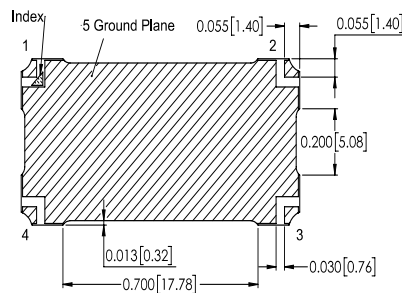
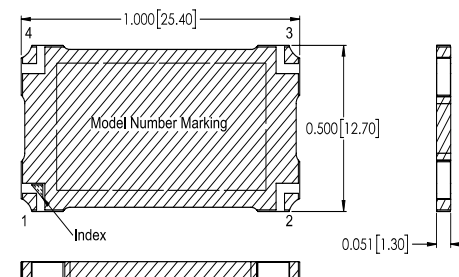
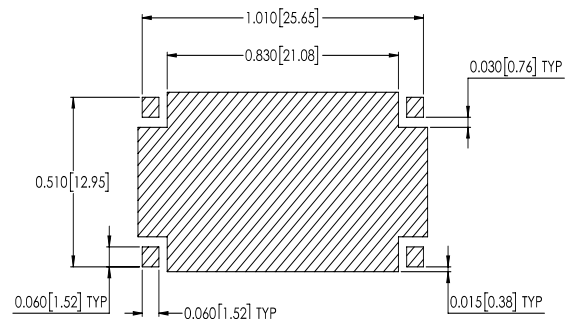


Figure 2. Suggested PCB Layout PL-538

CASE STYLE DRAWING (PQ2098)

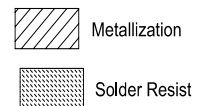


Suggested PCB Land Pattern



NOTES:

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



PRODUCT MARKING*: BDCH-20-272+

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



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.

[CLICK HERE](#)

| | |
|---------------------------------|---|
| Performance Data & Graphs | Data |
| | Graphs |
| | 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

