

# Coaxial Bi-Directional Coupler

50Ω Up to 20W 40 to 1000 MHz

## ZFBDC20-13HP+



SMA version shown  
CASE STYLE: JD1252

| Connectors | Model           | Price   | Qty.  |
|------------|-----------------|---------|-------|
| BNC        | ZFBDC20-13HP+   | \$70.95 | (1-9) |
| SMA        | ZFBDC20-13HP-S+ | \$75.95 | (1-9) |

**+ RoHS compliant in accordance with EU Directive (2002/95/EC)**

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

### Maximum Ratings

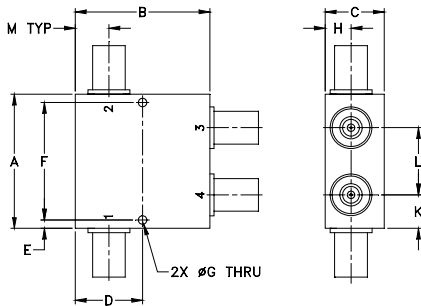
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |

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

### Coaxial Connections

|                   |   |
|-------------------|---|
| INPUT             | 1 |
| OUTPUT            | 2 |
| COUPLED (forward) | 4 |
| COUPLED (reverse) | 3 |

### Outline Drawing



### Outline Dimensions (inch/mm)

|       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| A     | B     | C     | D     | E     | F     | G     |
| 2.00  | 2.00  | .88   | 1.000 | 0.13  | 1.750 | 0.125 |
| 50.80 | 50.80 | 22.35 | 25.40 | 3.30  | 44.45 | 3.18  |
| H     | J     | K     | L     | M     | wt    |       |
| 0.38  | --    | 0.50  | 1.00  | 0.50  | grams |       |
| 9.65  | --    | 12.70 | 25.40 | 12.70 | 250.0 |       |

### Features

- excellent mainline loss, 0.4 dB typ.
- excellent directivity, 23 dB typ.
- high power, up to 20W
- rugged shielded case

### Applications

- power leveling & monitoring
- GPS
- cellular/PCS

### Bi-Directional Coupler Electrical Specifications

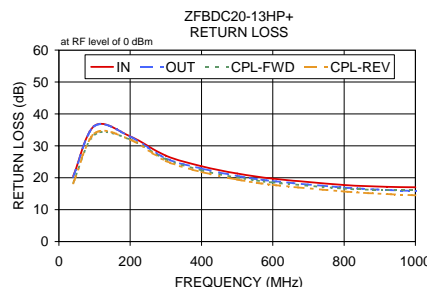
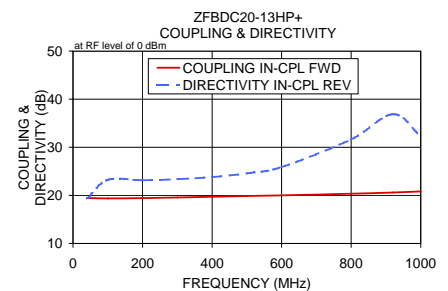
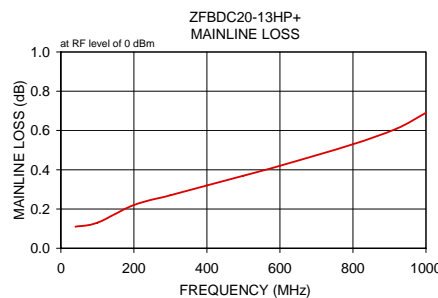
| FREQ. (MHz)   | COUPLING (dB) |          | MAINLINE LOSS <sup>1</sup> (dB) |      | DIRECTIVITY (dB) |      | VSWR (:1) | POWER <sup>2</sup> INPUT (W) |
|---------------|---------------|----------|---------------------------------|------|------------------|------|-----------|------------------------------|
|               | Nom.          | Flatness | Typ.                            | Max. | Typ.             | Min. |           |                              |
| $f_L$ - $f_U$ |               |          |                                 |      |                  |      |           |                              |
| 40-1000       | 20±0.5        | ±1.2     | 0.6                             | 1.0  | 22               | 16   | 1.20      | 10                           |
| 800-1000      | 20.5±0.7      | ±0.5     | 0.6                             | 1.0  | 23               | 16   | 1.30      | 10                           |
| 40-500        | 19.5±0.5      | ±0.5     | 0.3                             | 0.6  | 25               | 16   | 1.10      | 20                           |

<sup>1</sup> Mainline loss includes theoretical power loss at coupled port.

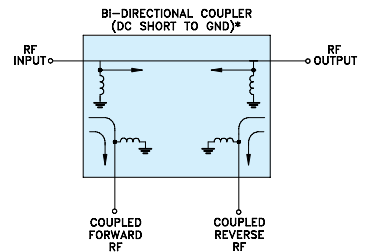
<sup>2</sup> Over +55°C derate linearly to 50% of rating at 100°C.

### 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 |
| 40.00           | 0.11               | 19.45      | 19.63         | 18.97       | 19.34            | 20.48 | 20.24            | 18.42   | 18.26   |
| 100.00          | 0.13               | 19.37      | 19.43         | 25.87       | 23.24            | 36.29 | 36.23            | 33.44   | 33.87   |
| 200.00          | 0.22               | 19.44      | 19.61         | 30.40       | 23.15            | 32.98 | 32.87            | 31.98   | 31.96   |
| 300.00          | 0.27               | 19.57      | 19.77         | 33.08       | 23.36            | 26.91 | 26.08            | 25.78   | 25.27   |
| 400.00          | 0.32               | 19.71      | 19.96         | 37.14       | 23.79            | 23.58 | 22.88            | 22.34   | 21.82   |
| 500.00          | 0.37               | 19.86      | 20.14         | 46.58       | 24.59            | 21.33 | 20.59            | 20.10   | 19.44   |
| 600.00          | 0.42               | 20.00      | 20.32         | 38.80       | 25.89            | 19.73 | 18.94            | 18.52   | 17.77   |
| 800.00          | 0.53               | 20.34      | 20.68         | 26.00       | 31.65            | 17.74 | 16.92            | 16.61   | 15.68   |
| 920.00          | 0.61               | 20.61      | 20.89         | 21.83       | 36.88            | 17.18 | 16.15            | 16.16   | 14.86   |
| 1000.00         | 0.69               | 20.83      | 21.08         | 19.32       | 32.27            | 17.01 | 15.83            | 16.08   | 14.52   |



### Electrical Schematic



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

For detailed performance specs & shopping online see web site

**Mini-Circuits**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED  
IF/RF MICROWAVE COMPONENTS

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

REV. B  
M124579  
ED-13224  
ZFBDC20-13HP+  
WP/CP/AM  
091016