

DC to 10 MHz Pass

# Bi-Directional Coupler

ZABDC20-232H+

50Ω Up to 50W 800 to 2300 MHz

## The Big Deal

- Excellent mainline loss, 0.25 dB typ.
- Excellent directivity, 23 dB typ.
- DC pass through, 2.0 A max @ 50 W RF power
- 10 MHz pass through



CASE STYLE: DD477-1

## Product Overview

Mini-Circuits ZABDC20-232H+ is a 20-dB bi-directional coupler ideal for power leveling and monitoring L-band applications. The rugged aluminum alloy case measures 2.0" x 2.0" x 0.88" high, with gold-plated SMA or N-type connectors.

## Key Features

| Feature                    | Advantages  |
|----------------------------|---|
| Mainline loss 0.25 dB typ. | Extremely low mainline loss for applications where signal strength is key, such as GPS, CDMA, UMTS, and LTE base station transmitters |
| Directivity 23 dB typ.     | Enables more accurate sampling for VSWR measurements  |
| DC pass through 2.0 A max. | Allows flexible deployment between active components and their DC power supplies  |
| 10 MHz pass through        | Pass through at 10 MHz supports reference clock frequency communication to remote systems   |
| Full L band coverage       | Extended frequency range makes this coupler ideal for use in satcom systems, such as LNB/BUC installations                            |

### Notes

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CASE STYLE: DD477-1

| Connectors | Model           |
|------------|-----------------|
| SMA        | ZABDC20-232H-S+ |
| N-Type     | ZABDC20-232H-N+ |

**+RoHS Compliant**

The +Suffix identifies 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 |
| DC Current            | 2.0 A          |

\* Case temperature is defined as temperature on ground leads. Permanent damage may occur if any of these limits are exceeded.

### Coaxial Connections

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

### Features

- excellent mainline loss, 0.25 dB typ.
- excellent directivity, 23 dB typ.
- high power, up to 50W
- rugged shielded case
- DC current through input to output 2.0A Max. at 50 watt RF input power
- 10 MHz pass through

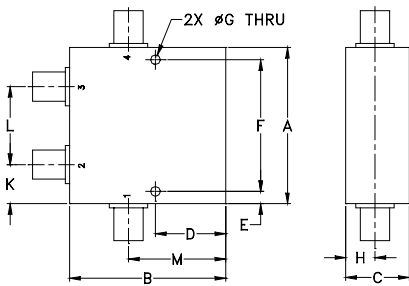
### Applications

- L Band
- PCS/DCS/UMTS
- power leveling & monitoring
- VSWR measurement
- satellite communication

### Electrical Specifications at 25°C

| Parameter  | Condition (MHz) | Min. | Typ.     | Max. | Units |
|--|-----------------|------|----------|------|-------|
| <b>Frequency Range</b>                           |                 | 800  |          | 2300 | MHz   |
| <b>Mainline Loss (above theoretical 0.05 dB)</b> | 800-2300        | —    | 0.23     | 0.35 | dB    |
|  | 950-1250        | —    | 0.17     | 0.30 |       |
|  | 1700-2050       | —    | 0.21     | 0.35 |       |
|  | 950-2150        | —    | 0.22     | 0.35 |       |
| <b>Coupling</b>                                  | 800-2300        | —    | 20.5±1.5 | —    | dB    |
|  | 950-1250        | —    | 20.5±1.0 | —    |       |
|  | 1700-2050       | —    | 19.5±0.8 | —    |       |
|  | 950-2150        | —    | 20.5±1.2 | —    |       |
| <b>Coupling Flatness (±)</b>                     | 800-2300        | —    | 1.5      | 1.9  | dB    |
|  | 950-1250        | —    | 0.7      | 0.9  |       |
|  | 1700-2050       | —    | 0.5      | 0.7  |       |
|  | 950-2150        | —    | 1.0      | 1.3  |       |
| <b>Directivity</b>                               | 800-2300        | 17   | 20       | —    | dB    |
|  | 950-1250        | 18   | 20       | —    |       |
|  | 1700-2050       | 19   | 23       | —    |       |
|  | 950-2150        | 18   | 20       | —    |       |
| <b>Return Loss (Input)</b>                       | 800-2300        | 18   | 23       | —    | dB    |
|  | 950-1250        | 18   | 23       | —    |       |
|  | 1700-2050       | 20   | 24       | —    |       |
|  | 950-2150        | 18   | 23       | —    |       |
| <b>Return Loss (Output)</b>                      | 800-2300        | 18   | 23       | —    | dB    |
|  | 950-1250        | 18   | 23       | —    |       |
|  | 1700-2050       | 20   | 25       | —    |       |
|  | 950-2150        | 18   | 23       | —    |       |
| <b>Return Loss (Coupling)</b>                    | 800-2300        | 16   | 19       | —    | dB    |
|  | 950-1250        | 17   | 19       | —    |       |
|  | 1700-2050       | 16   | 20       | —    |       |
| <b>Input Power</b>                               | 800-2300        | —    | —        | 50   | W     |

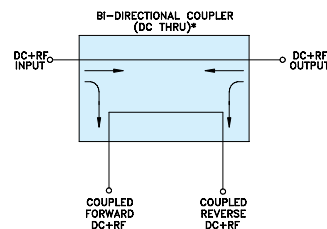
### Outline Drawing



### Outline Dimensions (inch/mm)

|       |       |       |       |       |       |      |
|-------|-------|-------|-------|-------|-------|------|
| A     | B     | C     | D     | E     | F     | G    |
| 2.00  | 2.00  | .88   | .90   | .156  | 1.688 | .125 |
| 50.80 | 50.80 | 22.35 | 22.86 | 3.96  | 42.88 | 3.18 |
| H     | J     | K     | L     | M     | wt    |      |
| .38   | ---   | .50   | 1.00  | 1.25  | grams |      |
| 9.65  | ---   | 12.70 | 25.40 | 31.75 | 225   |      |

### Electrical Schematic



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

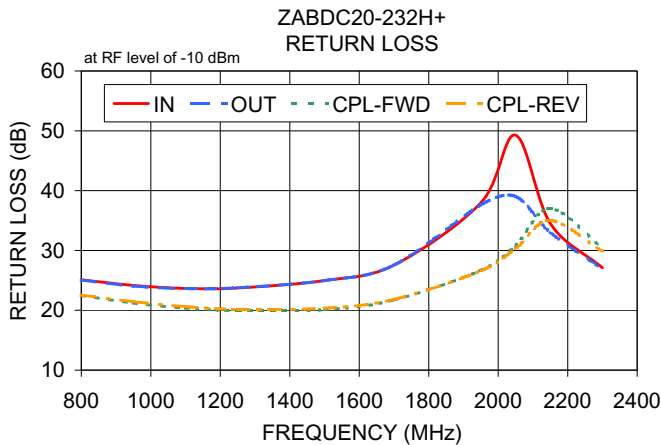
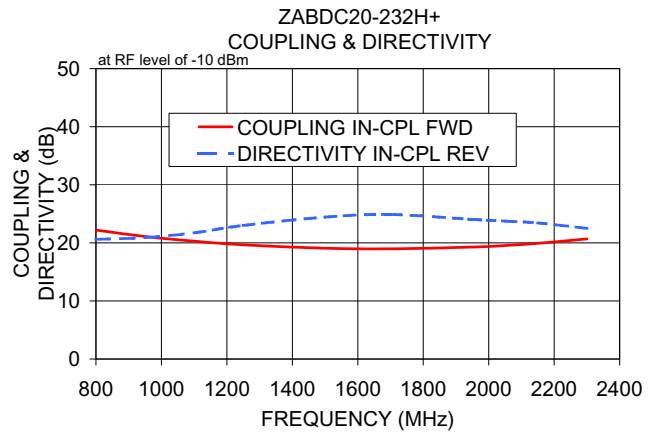
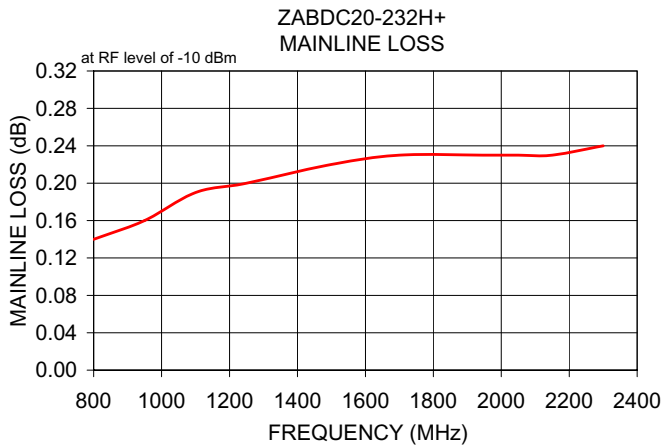
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## Typical Performance Data

| 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 |
| 800.00          | 0.14               | 22.19      | 22.18         | 20.87       | 20.60            | 25.12 | 25.06            | 22.48   | 22.54   |
| 950.00          | 0.16               | 21.10      | 21.09         | 21.04       | 20.91            | 24.16 | 24.04            | 21.21   | 21.44   |
| 1100.00         | 0.19               | 20.29      | 20.27         | 21.70       | 21.72            | 23.65 | 23.62            | 20.37   | 20.62   |
| 1250.00         | 0.20               | 19.67      | 19.66         | 22.84       | 23.00            | 23.74 | 23.78            | 19.94   | 20.17   |
| 1500.00         | 0.22               | 19.08      | 19.09         | 24.24       | 24.44            | 24.98 | 24.97            | 20.11   | 20.35   |
| 1700.00         | 0.23               | 18.98      | 18.97         | 24.82       | 24.88            | 27.55 | 27.56            | 21.72   | 21.83   |
| 1950.00         | 0.23               | 19.27      | 19.27         | 24.65       | 24.03            | 37.97 | 37.62            | 26.69   | 26.61   |
| 2050.00         | 0.23               | 19.54      | 19.53         | 24.19       | 23.74            | 49.29 | 39.04            | 30.82   | 30.31   |
| 2150.00         | 0.23               | 19.92      | 19.90         | 24.15       | 23.44            | 34.53 | 33.03            | 37.03   | 35.01   |
| 2300.00         | 0.24               | 20.69      | 20.68         | 23.47       | 22.50            | 27.11 | 26.92            | 30.45   | 29.88   |



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