

# Coaxial Directional Coupler

50Ω

1 to 1000 MHz

ZEDC-10-2B



Generic photo used for illustration purposes only  
CASE STYLE: V37

## 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 | 3 |

## Features

- wideband, 1 to 1000 MHz
- excellent directivity, 30 dB typ.
- rugged shielded case

## Applications

- VHF/UHF
- instrumentation
- communication receivers & transmitters
- cellular

Connectors Model  
SMA ZEDC-10-2B

## Directional Coupler Electrical Specifications

| FREQ.<br>(MHz)                 | COUPLING<br>(dB) |           | MAINLINE LOSS <sup>1</sup><br>(dB) |      |      |      |      |      | DIRECTIVITY<br>(dB) |      |      |      |      |      | POWER<br>INPUT<br>(W) |     |
|--------------------------------|------------------|-----------|------------------------------------|------|------|------|------|------|---------------------|------|------|------|------|------|-----------------------|-----|
|                                |                  |           | L                                  |      | M    |      | U    |      | L                   |      | M    |      | U    |      |                       |     |
|                                |                  |           | Typ.                               | Max. | Typ. | Max. | Typ. | Max. | Typ.                | Min. | Typ. | Min. | Typ. | Min. |                       |     |
| f <sub>l</sub> -f <sub>u</sub> | Nom.             | Flat-ness |                                    |      |      |      |      |      |                     |      |      |      |      |      |                       |     |
| 1-1000                         | 11±0.5           | ±0.75     | 1.3                                | 1.9  | 1.5  | 1.8  | 1.5  | 1.8  | 35                  | 30   | 30   | 20   | 18   | 13   | 1.5                   | 3.0 |

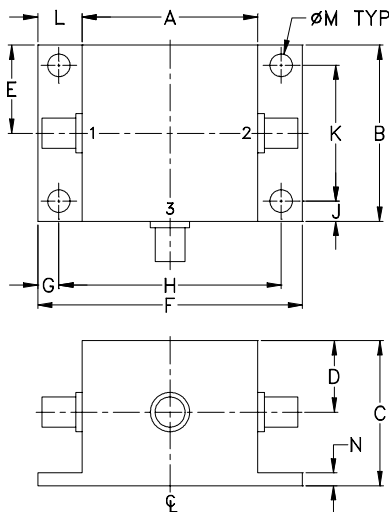
L = low range [ $f_L$  to  $10 f_L$ ] M = mid range [ $10 f_L$  to  $f_U/2$ ] U = upper range [ $f_U/2$  to  $f_U$ ]

1. Mainline loss includes theoretical power loss at coupled port. Loss will be go up to 2.5 dB @-55°C

## Typical Performance Data

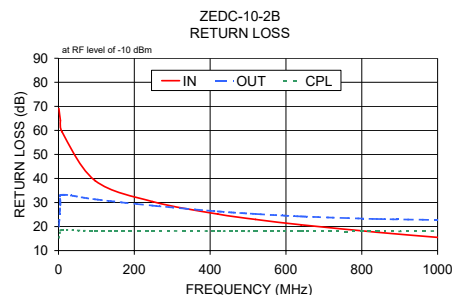
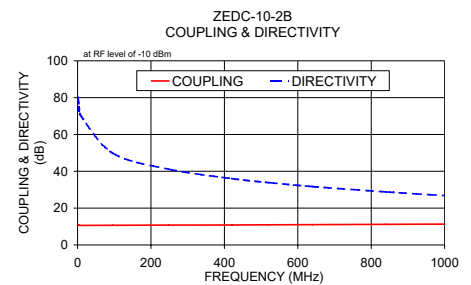
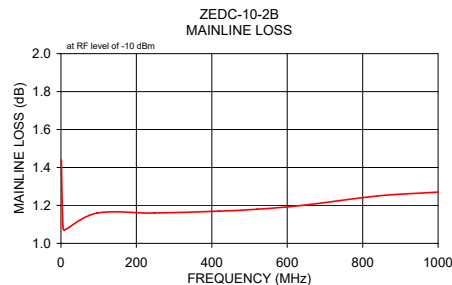
| Frequency<br>(MHz) | Mainline Loss<br>(dB)<br>In-Out | Coupling<br>(dB)<br>In-Cpl | Directivity<br>(dB) | Return Loss<br>(dB) |       |       |
|--------------------|---------------------------------|----------------------------|---------------------|---------------------|-------|-------|
|                    |                                 |                            |                     | In                  | Out   | Cpl   |
| 1.00               | 1.44                            | 11.03                      | 80.15               | 69.12               | 20.04 | 15.32 |
| 5.00               | 1.09                            | 10.64                      | 74.80               | 64.16               | 29.77 | 18.35 |
| 9.00               | 1.07                            | 10.62                      | 70.11               | 59.49               | 33.22 | 18.65 |
| 96.00              | 1.16                            | 10.69                      | 49.83               | 39.14               | 31.36 | 18.19 |
| 248.00             | 1.16                            | 10.76                      | 41.15               | 30.39               | 28.72 | 18.19 |
| 420.00             | 1.17                            | 10.84                      | 36.04               | 25.20               | 26.31 | 18.12 |
| 520.00             | 1.18                            | 10.92                      | 33.89               | 22.97               | 25.24 | 18.03 |
| 640.00             | 1.20                            | 11.01                      | 31.72               | 20.71               | 24.23 | 17.96 |
| 840.00             | 1.25                            | 11.21                      | 28.83               | 17.62               | 23.14 | 17.96 |
| 1000.00            | 1.27                            | 11.32                      | 26.81               | 15.49               | 22.76 | 18.15 |

## Outline Drawing

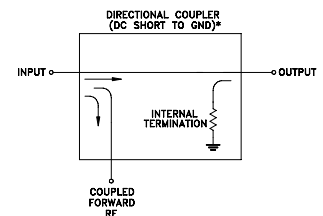


## Outline Dimensions (inch mm)

|       |       |       |      |       |       |       |
|-------|-------|-------|------|-------|-------|-------|
| A     | B     | C     | D    | E     | F     | G     |
| .83   | .83   | .75   | .37  | .42   | 1.25  | .10   |
| 21.08 | 21.08 | 19.05 | 9.40 | 10.67 | 31.75 | 2.54  |
| H     | J     | K     | L    | M     | N     | wt    |
| 1.050 | .10   | .640  | .21  | .106  | .06   | grams |
| 26.67 | 2.54  | 16.26 | 5.33 | 2.69  | 1.52  | 22.0  |



## Electrical Schematic



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

## 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.  
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REV. D  
ECO-017643  
ZEDC-10-2B  
WZ/TD/CP  
230427

# Directional Coupler

## ZEDC-10-2B

### Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | COUPLING<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |       |       |
|--------------------|---------------------------|------------------|---------------------|-------------|-------|-------|
|                    |                           |                  |                     | IN          | OUT   | CPL   |
| 1.0                | 1.44                      | 11.03            | 80.15               | 69.12       | 20.04 | 15.32 |
| 2.0                | 1.23                      | 10.80            | 77.22               | 66.42       | 23.65 | 16.92 |
| 3.0                | 1.15                      | 10.71            | 75.87               | 65.16       | 26.28 | 17.72 |
| 4.0                | 1.11                      | 10.67            | 76.13               | 65.46       | 28.25 | 18.12 |
| 5.0                | 1.09                      | 10.64            | 74.80               | 64.16       | 29.77 | 18.35 |
| 6.0                | 1.08                      | 10.63            | 72.79               | 62.15       | 30.96 | 18.49 |
| 7.0                | 1.07                      | 10.62            | 72.21               | 61.59       | 31.89 | 18.57 |
| 8.0                | 1.07                      | 10.61            | 71.56               | 60.95       | 32.63 | 18.62 |
| 9.0                | 1.07                      | 10.62            | 70.11               | 59.49       | 33.22 | 18.65 |
| 10.0               | 1.07                      | 10.61            | 70.25               | 59.64       | 33.65 | 18.67 |
| 20.0               | 1.09                      | 10.62            | 63.53               | 52.90       | 34.22 | 18.58 |
| 58.0               | 1.15                      | 10.67            | 54.40               | 43.72       | 32.09 | 18.24 |
| 96.0               | 1.16                      | 10.69            | 49.83               | 39.14       | 31.36 | 18.19 |
| 134.0              | 1.16                      | 10.71            | 46.85               | 36.14       | 30.73 | 18.18 |
| 172.0              | 1.16                      | 10.73            | 44.53               | 33.80       | 30.01 | 18.18 |
| 210.0              | 1.16                      | 10.73            | 42.71               | 31.98       | 29.34 | 18.18 |
| 248.0              | 1.16                      | 10.76            | 41.15               | 30.39       | 28.72 | 18.19 |
| 286.0              | 1.16                      | 10.77            | 39.83               | 29.06       | 28.13 | 18.18 |
| 324.0              | 1.16                      | 10.78            | 38.60               | 27.82       | 27.56 | 18.17 |
| 362.0              | 1.16                      | 10.83            | 37.54               | 26.71       | 27.04 | 18.15 |
| 400.0              | 1.16                      | 10.81            | 36.55               | 25.74       | 26.54 | 18.12 |
| 420.0              | 1.17                      | 10.84            | 36.04               | 25.20       | 26.31 | 18.12 |
| 440.0              | 1.17                      | 10.86            | 35.61               | 24.74       | 26.07 | 18.10 |
| 460.0              | 1.17                      | 10.88            | 35.17               | 24.28       | 25.84 | 18.08 |
| 480.0              | 1.16                      | 10.88            | 34.68               | 23.81       | 25.62 | 18.07 |
| 500.0              | 1.17                      | 10.88            | 34.25               | 23.38       | 25.42 | 18.05 |
| 520.0              | 1.18                      | 10.92            | 33.89               | 22.97       | 25.24 | 18.03 |
| 540.0              | 1.19                      | 10.94            | 33.52               | 22.58       | 25.04 | 18.03 |
| 560.0              | 1.17                      | 10.94            | 33.09               | 22.15       | 24.87 | 18.01 |
| 580.0              | 1.18                      | 10.95            | 32.77               | 21.82       | 24.70 | 18.00 |
| 600.0              | 1.19                      | 10.97            | 32.40               | 21.43       | 24.54 | 17.99 |
| 640.0              | 1.20                      | 11.01            | 31.72               | 20.71       | 24.23 | 17.96 |
| 680.0              | 1.21                      | 11.04            | 31.09               | 20.05       | 23.95 | 17.94 |
| 720.0              | 1.22                      | 11.08            | 30.48               | 19.40       | 23.71 | 17.94 |
| 760.0              | 1.22                      | 11.13            | 29.91               | 18.79       | 23.50 | 17.93 |
| 800.0              | 1.22                      | 11.14            | 29.33               | 18.20       | 23.30 | 17.95 |
| 840.0              | 1.25                      | 11.21            | 28.83               | 17.62       | 23.14 | 17.96 |
| 880.0              | 1.22                      | 11.23            | 28.29               | 17.06       | 23.00 | 17.99 |
| 920.0              | 1.28                      | 11.25            | 27.77               | 16.52       | 22.91 | 18.04 |
| 960.0              | 1.25                      | 11.35            | 27.35               | 16.00       | 22.82 | 18.09 |
| 1000.0             | 1.27                      | 11.32            | 26.81               | 15.49       | 22.76 | 18.15 |

REV. X1

ZEDC-10-2B

060718

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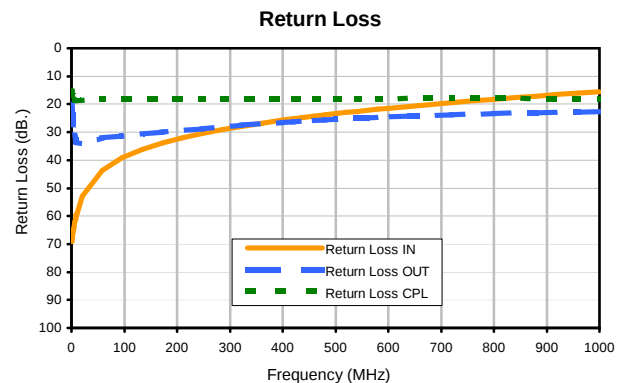
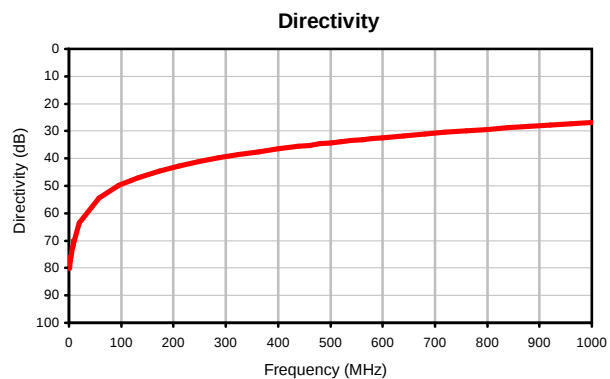
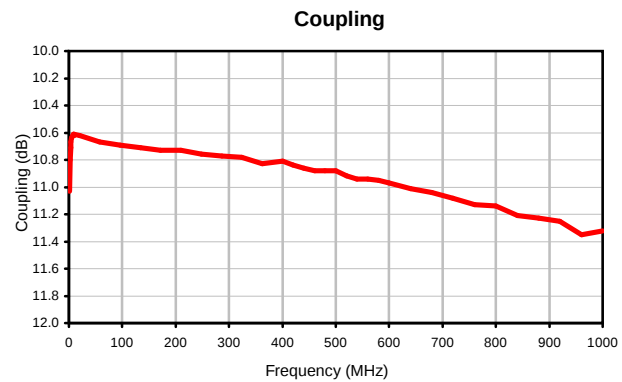
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# Directional Coupler

ZEDC-10-2B

## Typical Performance Curves



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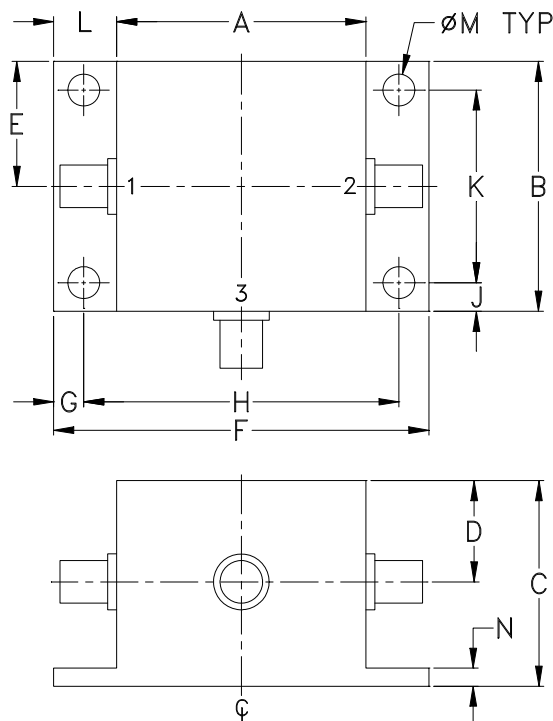


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## Outline Dimensions

V37



| CASE# | A              | B              | C              | D             | E              | F               | G             | H                | J             | K               | L             | M              | N             | WT<br>GRAMS |
|-------|----------------|----------------|----------------|---------------|----------------|-----------------|---------------|------------------|---------------|-----------------|---------------|----------------|---------------|-------------|
| V37   | .83<br>(21.08) | .83<br>(21.08) | .75<br>(19.05) | .37<br>(9.40) | .42<br>(10.67) | 1.25<br>(31.75) | .10<br>(2.54) | 1.050<br>(26.67) | .10<br>(2.54) | .640<br>(16.26) | .21<br>(5.33) | .106<br>(2.69) | .06<br>(1.52) | 22.0        |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

### Notes:

1. Case material: Aluminum alloy.
2. Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Refer to the individual model data sheet for the type of connectors available.



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| Specification              | Test/Inspection Condition                                                              | Reference/Spec                       |
|----------------------------|----------------------------------------------------------------------------------------|--------------------------------------|
| Operating Temperature      | -55° to 100°C<br>Ambient Environment                                                   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)    | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |