

Coaxial Directional Coupler

50Ω

0.1 to 2000 MHz

ZFDC-20-5+



BNC version shown

CASE STYLE: K18

| Connectors | Model |
|----------------------|--------------|
| BNC | ZFDC-20-5+ |
| SMA | ZFDC-20-5-S+ |
| N-TYPE | ZFDC-20-5-N+ |
| BRACKET (OPTION "B") | |

+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

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

Coaxial Connections

| | |
|---------|---|
| INPUT | 3 |
| OUTPUT | 1 |
| COUPLED | 2 |

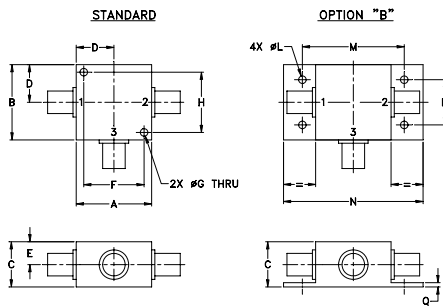
Features

- very wideband, 0.1 to 2000 MHz
- excellent directivity, 27 dB typ.
- excellent mainline loss, 0.7 dB typ.
- rugged shielded case

Applications

- cellular
- instrumentation
- communication receivers & transmitters

Outline Drawing



Outline Dimensions (inch/mm)

| | | | | | | | |
|-------|-------|-------|-------|-------|-------|------|-------|
| A | B | C | D | E | F | G | H |
| 1.25 | 1.25 | .75 | .63 | .38 | 1.00 | .125 | 1.000 |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.65 | 25.40 | 3.18 | 25.40 |
| J | K | L | M | N | P | Q | wt |
| -- | -- | .125 | 1.688 | 2.18 | .75 | .07 | grams |
| -- | -- | 3.18 | 42.88 | 55.37 | 19.05 | 1.78 | 70.0 |

Electrical Specifications

| FREQ. RANGE (MHz) | COUPLING* (dB) | | MAINLINE LOSS ¹ (dB) | | | | DIRECTIVITY (dB) | | | VSWR (:1) | POWER INPUT (W) | | | | | | |
|--------------------------------|----------------|----------|---------------------------------|------|------|------|------------------|------|------|-----------|-----------------|----|----|------|------|------|-----|
| | Nom. | Flatness | L | | M | | U | | | | Typ. | L | MU | | | | |
| | | | Typ. | Max. | Typ. | Max. | Typ. | Max. | Typ. | | | | | Min. | Typ. | Min. | |
| f _L -f _U | 19.5±0.5 | ±0.5 | 0.3 | 1.0 | 0.7 | 1.4 | 1.5 | 2.3 | 30 | 20 | 27 | 20 | 22 | 10 | 1.2 | 0.5 | 2.0 |

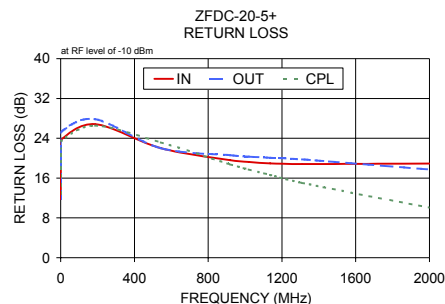
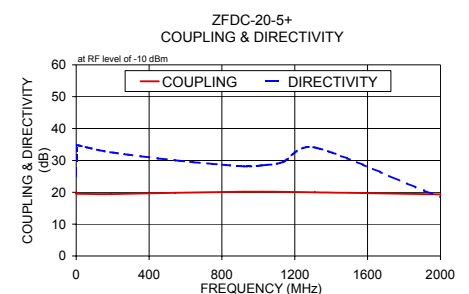
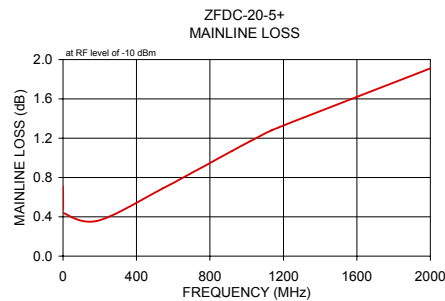
L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/2] U = upper range [f_U/2 to f_U]

1. Mainline loss includes theoretical power loss at coupled port.

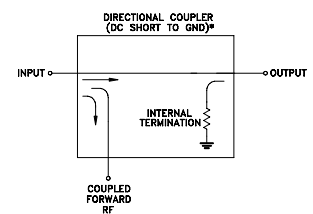
* Above 1000 MHz, coupling flatness ±1 dB.

Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | Cpl |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | |
| 0.10 | 0.71 | 19.79 | 25.09 | 11.79 | 11.84 | 12.78 |
| 0.50 | 0.49 | 19.57 | 33.79 | 21.84 | 22.89 | 21.74 |
| 0.90 | 0.44 | 19.52 | 34.79 | 23.69 | 25.23 | 23.40 |
| 188.00 | 0.36 | 19.46 | 32.56 | 26.83 | 27.83 | 26.54 |
| 544.00 | 0.69 | 19.85 | 30.03 | 22.02 | 22.00 | 23.17 |
| 920.00 | 1.07 | 20.18 | 28.13 | 19.60 | 20.58 | 18.75 |
| 1020.00 | 1.17 | 20.18 | 28.46 | 19.23 | 20.30 | 17.73 |
| 1136.00 | 1.28 | 20.13 | 29.48 | 18.96 | 20.07 | 16.64 |
| 1310.00 | 1.41 | 19.96 | 34.06 | 18.82 | 19.75 | 15.02 |
| 2000.00 | 1.91 | 19.34 | 18.40 | 18.91 | 17.73 | 10.05 |



Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMERS THAT ROUTES DC FROM RF PORTS TO GROUND.

Notes

- 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. C
M151107
ZFDC-20-5+
WZ/TD/CP+AM
151007

Directional Coupler

ZFDC-20-5+

Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | COUPLING (dB) | DIRECTIVITY (dB) | RETURN LOSS | | |
|--------------------|---------------------------|------------------|---------------------|-------------|-------------|-------|
| | | | | IN (dB) | OUT (dB) | CPL |
| 0.1 | 0.71 | 19.79 | 25.09 | 11.79 | 11.84 | 12.78 |
| 0.2 | 0.52 | 19.60 | 29.98 | 17.07 | 17.36 | 17.74 |
| 0.3 | 0.50 | 19.59 | 31.99 | 19.63 | 20.21 | 19.93 |
| 0.4 | 0.49 | 19.58 | 33.07 | 21.00 | 21.85 | 21.04 |
| 0.5 | 0.49 | 19.57 | 33.79 | 21.84 | 22.89 | 21.74 |
| 0.6 | 0.47 | 19.56 | 34.18 | 22.44 | 23.63 | 22.26 |
| 0.7 | 0.46 | 19.55 | 34.44 | 22.92 | 24.24 | 22.69 |
| 0.8 | 0.45 | 19.54 | 34.68 | 23.32 | 24.76 | 23.06 |
| 0.9 | 0.44 | 19.52 | 34.79 | 23.69 | 25.23 | 23.40 |
| 1.0 | 0.42 | 19.51 | 34.68 | 24.03 | 25.65 | 23.70 |
| 10.0 | 0.28 | 19.36 | 33.58 | 28.93 | 33.11 | 27.27 |
| 99.0 | 0.31 | 19.40 | 33.05 | 28.24 | 30.81 | 26.90 |
| 188.0 | 0.36 | 19.46 | 32.56 | 26.83 | 27.83 | 26.54 |
| 277.0 | 0.43 | 19.54 | 31.92 | 25.35 | 25.74 | 25.92 |
| 366.0 | 0.51 | 19.64 | 31.39 | 24.08 | 24.05 | 25.16 |
| 455.0 | 0.60 | 19.75 | 30.66 | 22.95 | 22.82 | 24.21 |
| 544.0 | 0.69 | 19.85 | 30.03 | 22.02 | 22.00 | 23.17 |
| 633.0 | 0.79 | 19.96 | 29.29 | 21.28 | 21.45 | 22.09 |
| 722.0 | 0.87 | 20.05 | 28.83 | 20.67 | 21.11 | 21.00 |
| 811.0 | 0.97 | 20.14 | 28.34 | 20.13 | 20.85 | 19.94 |
| 900.0 | 1.06 | 20.20 | 28.11 | 19.68 | 20.62 | 18.96 |
| 920.0 | 1.07 | 20.18 | 28.13 | 19.60 | 20.58 | 18.75 |
| 940.0 | 1.10 | 20.18 | 28.05 | 19.52 | 20.54 | 18.54 |
| 960.0 | 1.11 | 20.19 | 28.30 | 19.44 | 20.47 | 18.33 |
| 980.0 | 1.13 | 20.21 | 28.34 | 19.36 | 20.41 | 18.13 |
| 1000.0 | 1.15 | 20.21 | 28.36 | 19.29 | 20.35 | 17.93 |
| 1020.0 | 1.17 | 20.18 | 28.46 | 19.23 | 20.30 | 17.73 |
| 1040.0 | 1.19 | 20.16 | 28.51 | 19.18 | 20.29 | 17.54 |
| 1060.0 | 1.20 | 20.17 | 28.70 | 19.11 | 20.23 | 17.36 |
| 1080.0 | 1.22 | 20.17 | 28.89 | 19.07 | 20.17 | 17.18 |
| 1100.0 | 1.24 | 20.15 | 29.00 | 19.02 | 20.13 | 16.98 |
| 1136.0 | 1.28 | 20.13 | 29.48 | 18.96 | 20.07 | 16.64 |
| 1172.0 | 1.30 | 20.09 | 29.99 | 18.91 | 20.01 | 16.32 |
| 1208.0 | 1.33 | 20.07 | 30.74 | 18.87 | 19.94 | 15.98 |
| 1244.0 | 1.37 | 20.01 | 31.52 | 18.85 | 19.86 | 15.62 |
| 1280.0 | 1.38 | 19.94 | 32.70 | 18.84 | 19.82 | 15.30 |
| 1310.0 | 1.41 | 19.96 | 34.06 | 18.82 | 19.75 | 15.02 |
| 1340.0 | 1.45 | 19.88 | 35.19 | 18.83 | 19.70 | 14.76 |
| 1370.0 | 1.46 | 19.81 | 36.73 | 18.86 | 19.71 | 14.50 |
| 1685.0 | 1.69 | 19.39 | 27.77 | 19.09 | 19.11 | 11.99 |
| 2000.0 | 1.91 | 19.34 | 18.40 | 18.91 | 17.73 | 10.05 |

REV. X1
ZFDC-20-5+
060718
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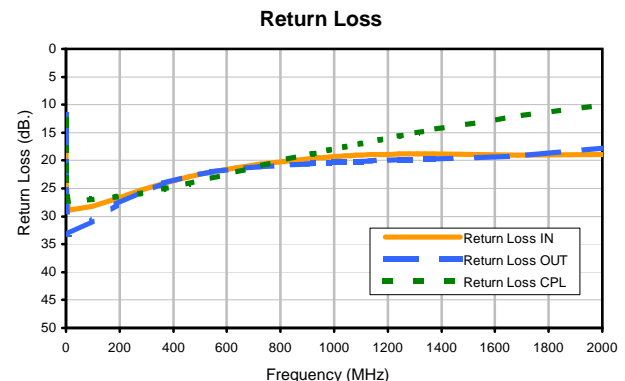
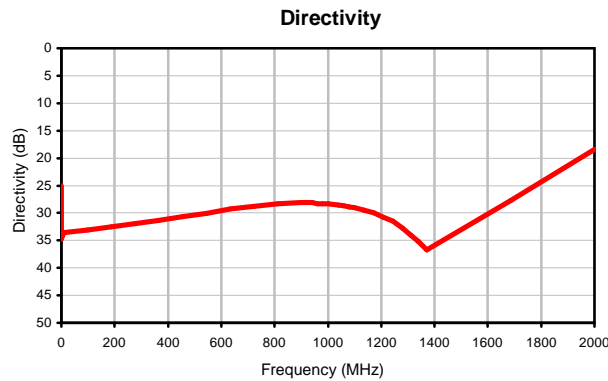
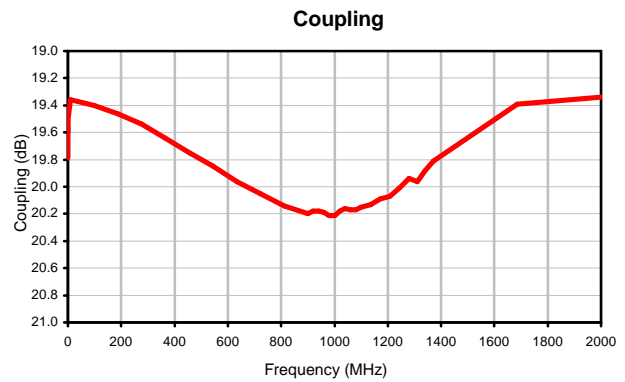
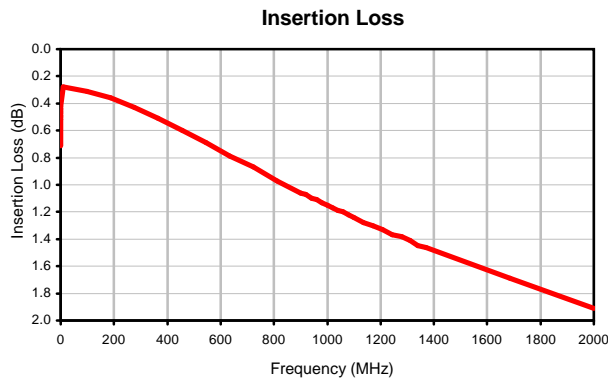
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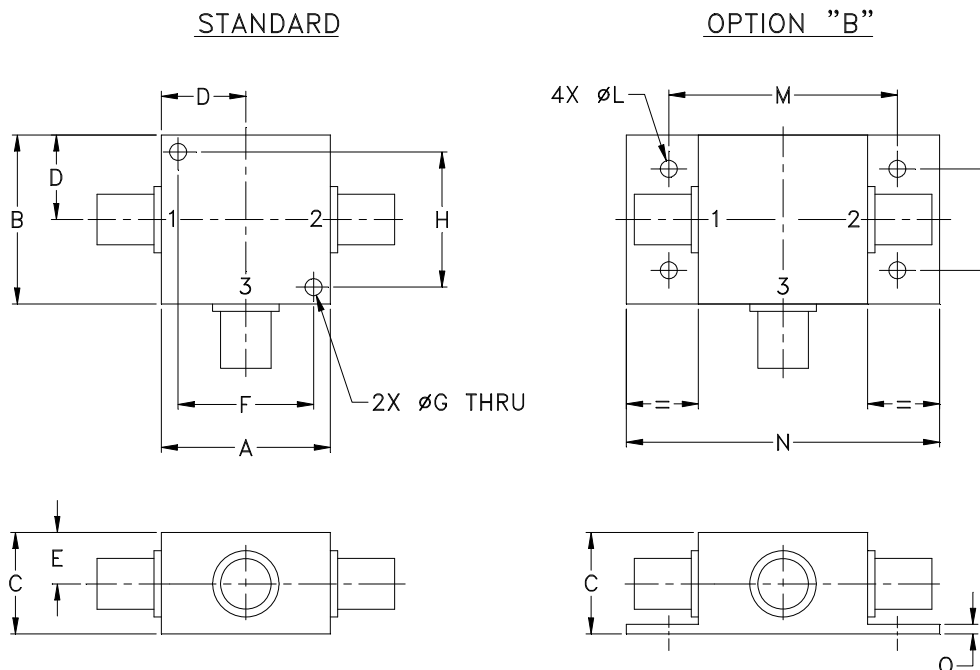
Directional Coupler

ZFDC-20-5+

Typical Performance Curves



Outline Dimensions



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|-------|-----------------|-----------------|----------------|----------------|---------------|------------------|----------------|------------------|----|----|----------------|------------------|-----------------|
| K18 | 1.25 (31.75) | 1.25 (31.75) | .75 (19.05) | .63 (16.00) | .38 (9.65) | 1.000 (25.40) | .125 (3.18) | 1.000 (25.40) | -- | -- | .125 (3.18) | 1.688 (42.88) | 2.18 (55.37) |

| CASE# | P | Q | WT. GRAMS |
|-------|----------------|---------------|-----------|
| K18 | .75 (19.05) | .07 (1.78) | 70.0 |

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

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Mounting bracket available on request. Add suffix B to part number.
- For port marking 1, 2, and 3 see specifications data sheet.
- For bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
- 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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |
| Humidity | 90% RH, 65°C 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 |