

Coaxial, High Directivity

# Directional Coupler

ZHDC-Model Series

50Ω 10 and 16 dB Coupling 50 to 6000 MHz

## The Big Deal

- High directivity, up to 33 dB
- Wideband, 50 to 6000 MHz
- Excellent coupling flatness



CASE STYLE: FM1918

## Product Overview

Mini-Circuits' ZHDC-series high-directivity directional couplers provide outstanding directivity and excellent coupling flatness from 50 to 6000 MHz, making them low cost solutions for S-parameter measurements and intermodulation measurements as well as other test and system applications. Available in different coupling values to meet different requirements, they come housed in an aluminum alloy case (2.5 x 1.4 x 0.88") with SMA connectors at all ports.

| Feature                       | Advantages  |
|-------------------------------|---|
| High directivity, up to 33 dB | High directivity allows accurate signal sampling through the coupled port with minimal measurement error. |
| Wideband, 50 to 6000 MHz      | One device supports a broad range of system and test lab applications.                                    |
| Flat coupling, $\pm 0.45$ dB  | Provides consistent coupling performance across frequency.  |
| Good VSWR. 1.2:1 typ.         | Well-matched for 50Ω systems.   |
| Small size, 2.5 x 1.4 x 0.88" | Saves space in crowded spaces and dense system layouts.   |

### 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-Circuit's 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# Coaxial High Directivity Directional Coupler

## ZHDC-16-63-S+

50Ω 16 dB Coupling 50 to 6000 MHz

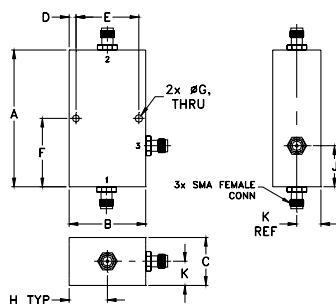
### Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

### Coaxial Connections

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

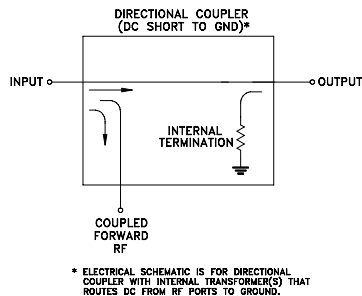
### Outline Drawing



### Outline Dimensions (inch/mm)

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| A     | B     | C     | D     | E     | F     |
| 2.50  | 1.4   | 0.88  | 0.13  | 1.15  | 1.25  |
| 63.50 | 35.56 | 22.35 | 3.30  | 29.21 | 31.75 |
| G     | H     | J     | K     |       | wt    |
| 0.14  | 0.7   | 0.75  | 0.44  |       | grams |
| 3.56  | 17.78 | 19.05 | 11.18 |       | 100.0 |

### Electrical Schematic



### Features

- wideband, 50 to 6000 MHz
- high directivity, 32 dB typ.
- flat coupling, ±0.45 dB typ.
- good VSWR, 1.20:1 typ.

### Applications

- military defense
- test and measurement
- laboratory use



Generic photo used for illustration purposes only  
CASE STYLE: FM1918

|            |               |
|------------|---------------|
| Connectors | Model         |
| SMA        | ZHDC-16-63-S+ |

### +RoHS Compliant

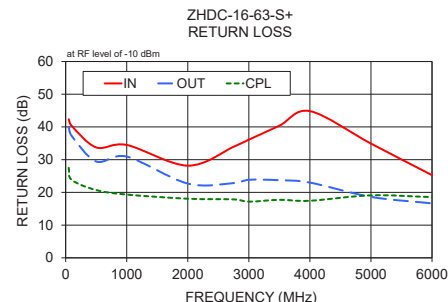
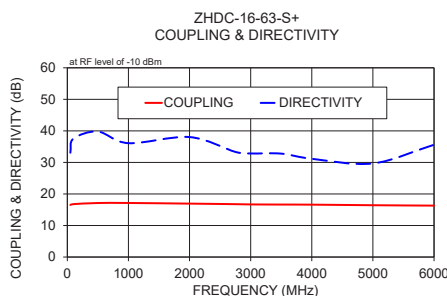
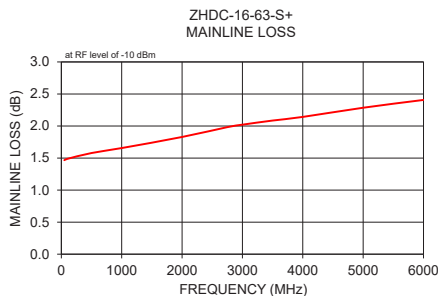
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Electrical Specifications at 25°C

| Parameter              | Condition (MHz)        | Min.     | Typ.     | Max. | Unit |
|------------------------|------------------------|----------|----------|------|------|
| Frequency Range        |                        | 50       | —        | 6000 | MHz  |
| Mainline Loss          | 50 - 6000              | —        | 2.0      | 3.0  | dB   |
| Coupling               | 50 - 6000              | 15.5     | 16.7     | 17.5 | dB   |
| Coupling Flatness(±)   | 50 - 6000              | —        | 0.45     | 0.9  | dB   |
| Directivity            | 50-3000<br>3000-6000   | 26<br>24 | 32<br>30 | —    | dB   |
| Return Loss (Input)    | 50 - 3000<br>3000-6000 | —        | 24<br>22 | —    | dB   |
| Return Loss (Output)   | 50 - 3000<br>3000-6000 | —        | 21<br>18 | —    | dB   |
| Return Loss (Coupling) | 50 - 3000<br>3000-6000 | —        | 18<br>17 | —    | dB   |
| Input Power            | 50 - 6000              | —        | —        | 0.5  | W    |

### Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |       |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
|                 |                           |                      |                  | In               | Out   | Cpl   |
| 50              | 1.47                      | 16.54                | 33.07            | 42.34            | 39.93 | 27.52 |
| 100             | 1.49                      | 16.78                | 37.54            | 40.29            | 37.22 | 23.79 |
| 500             | 1.58                      | 17.13                | 39.79            | 33.74            | 29.44 | 20.72 |
| 1000            | 1.66                      | 17.14                | 36.11            | 34.49            | 30.93 | 19.34 |
| 2000            | 1.83                      | 16.94                | 38.05            | 28.16            | 22.70 | 18.07 |
| 2750            | 1.98                      | 16.77                | 33.34            | 33.94            | 22.85 | 17.86 |
| 3000            | 2.02                      | 16.69                | 32.84            | 36.11            | 23.85 | 17.17 |
| 3500            | 2.09                      | 16.65                | 32.79            | 40.38            | 23.72 | 17.73 |
| 4000            | 2.14                      | 16.61                | 31.16            | 44.83            | 22.99 | 17.44 |
| 5000            | 2.29                      | 16.43                | 29.68            | 34.91            | 18.62 | 19.10 |
| 6000            | 2.41                      | 16.31                | 35.60            | 25.26            | 16.64 | 18.56 |



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