

# Wideband, DC Pass Directional Coupler

ZCDC20-K1844+

50Ω 20dB Up to 20W 18 to 40 GHz

## The Big Deal

- Wideband, 18 to 40 GHz
- Excellent Coupling Flatness,  $\pm 0.4$  dB typ.
- Power Handling up to 20W



CASE STYLE: HT2536-1

## Product Overview

The Mini-Circuits' ZCDC20-K1844+ wideband directional coupler offers exceptional performance operating over 18 to 40 GHz. This coupler has excellent coupling flatness, good directivity, and power handling. It is ideal for lab testing applications as well as for power monitoring over wide bands, among other applications.

## Key Features

| Feature                                                                                               | Advantages                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wide bandwidth                                                                                        | With a bandwidth spanning 18 to 40 GHz, ZCDC20-K1844+ coupler is ideal for most lab testing applications, avoiding the need to switch components for different frequency bands. |
| Excellent Directivity <ul style="list-style-type: none"><li>• 16 dB typ. up to 40 GHz</li></ul>       | High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches.                                                                     |
| Excellent coupling flatness, $\pm 0.4$ dB typ                                                         | Excellent coupling flatness over the entire frequency range minimizes the need for compensation circuits in most cases.                                                         |
| Good Return Loss (In & Out) <ul style="list-style-type: none"><li>• 13 dB typ. up to 40 GHz</li></ul> | Good return loss over 18 to 40 GHz minimizes undesired reflections and resulting amplitude ripple.                                                                              |

### 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.  
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50Ω 20dB Up to 20W 18 to 40 GHz

## ZCDC20-K1844+



Generic photo used for illustration purposes only

CASE STYLE: HT2536-1

| Connectors    | Model         |
|---------------|---------------|
| 2.92mm Female | ZCDC20-K1844+ |

+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 |
| Supplied Termination* | 1 W            |
| DC Current            | 0.6 A          |

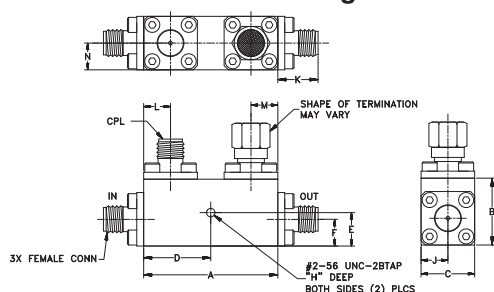
Permanent damage may occur if any of these limits are exceeded

\* up to 25°C, derates linearly to 325mW at 100°C.

### Coaxial Connections

|                            |     |
|----------------------------|-----|
| INPUT                      | IN  |
| OUTPUT                     | OUT |
| COUPLED                    | CPL |
| TERMINATION (50Ω) INCLUDED | —   |

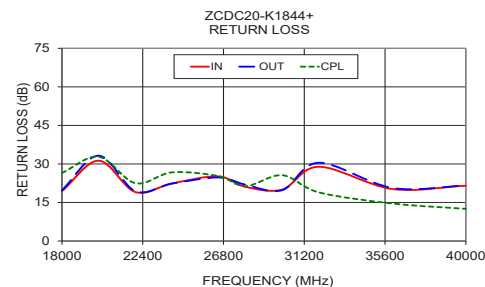
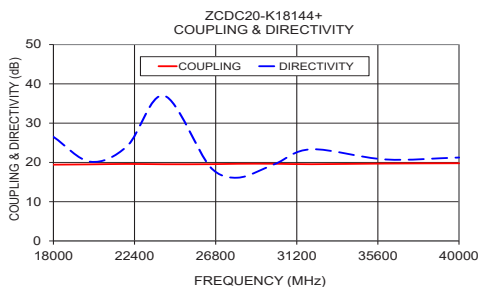
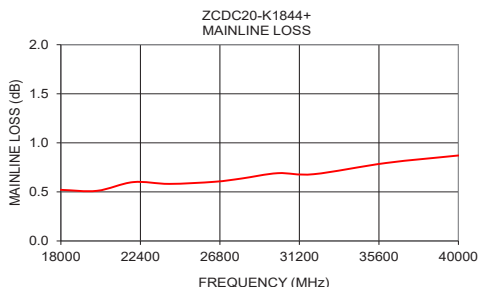
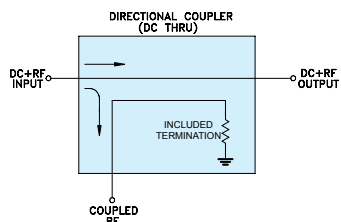
### Outline Drawing



### Outline Dimensions (inch/mm)

| A     | B    | C     | D     | E     | F    | G     |
|-------|------|-------|-------|-------|------|-------|
| 1.25  | 0.63 | 0.50  | 0.63  | 0.313 | 0.25 | --    |
| 31.75 | 16.0 | 12.7  | 15.88 | 7.95  | 6.35 | --    |
| H     | J    | K     | L     | M     | N    | wt    |
| 0.120 | 0.25 | 0.43  | 0.25  | 0.25  | 0.25 | grams |
| 3.05  | 6.35 | 10.92 | 6.35  | 6.35  | 6.35 | 50    |

### Electrical Schematic



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ZCDC20-K1844+  
WPE/CP/AM  
190220  
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# Directional Coupler

## ZCDC20-K1844+

### Typical Performance Data

| FREQ.<br>(MHz) | INSERTION<br>LOSS <sup>(1)</sup><br>(dB) | COUPLING<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS<br>(dB) |       |       |
|----------------|------------------------------------------|------------------|---------------------|---------------------|-------|-------|
|                |                                          |                  |                     | IN                  | OUT   | CPL   |
| 14000          | 0.41                                     | 19.33            | 22.54               | 31.26               | 31.60 | 27.85 |
| 14500          | 0.42                                     | 19.32            | 20.79               | 29.33               | 30.35 | 32.55 |
| 15000          | 0.45                                     | 19.41            | 19.52               | 20.98               | 21.75 | 30.99 |
| 15500          | 0.49                                     | 19.50            | 19.45               | 18.46               | 19.14 | 27.85 |
| 16000          | 0.51                                     | 19.49            | 20.22               | 18.65               | 19.33 | 27.18 |
| 16500          | 0.48                                     | 19.43            | 22.19               | 21.86               | 22.54 | 28.17 |
| 17000          | 0.46                                     | 19.41            | 25.40               | 33.37               | 35.21 | 29.41 |
| 17500          | 0.47                                     | 19.42            | 28.41               | 25.84               | 26.02 | 28.47 |
| 18000          | 0.52                                     | 19.43            | 26.50               | 19.44               | 19.75 | 26.51 |
| 18500          | 0.57                                     | 19.44            | 22.85               | 17.26               | 17.76 | 24.88 |
| 19000          | 0.57                                     | 19.51            | 20.82               | 17.86               | 18.49 | 24.96 |
| 19500          | 0.54                                     | 19.53            | 19.96               | 20.92               | 21.93 | 27.38 |
| 20000          | 0.51                                     | 19.50            | 20.18               | 31.26               | 33.20 | 32.79 |
| 20500          | 0.52                                     | 19.55            | 21.18               | 27.22               | 26.13 | 33.61 |
| 21000          | 0.56                                     | 19.66            | 22.49               | 20.19               | 20.06 | 27.27 |
| 21500          | 0.60                                     | 19.69            | 23.45               | 18.51               | 18.53 | 23.47 |
| 22000          | 0.60                                     | 19.61            | 24.15               | 19.05               | 19.37 | 22.50 |
| 22500          | 0.57                                     | 19.57            | 25.24               | 22.90               | 23.41 | 23.64 |
| 23000          | 0.55                                     | 19.56            | 27.54               | 32.36               | 37.53 | 28.02 |
| 23500          | 0.56                                     | 19.50            | 32.03               | 27.74               | 27.63 | 39.02 |
| 24000          | 0.58                                     | 19.53            | 37.01               | 22.41               | 22.35 | 26.73 |
| 24500          | 0.61                                     | 19.52            | 34.77               | 21.24               | 21.28 | 21.78 |
| 25000          | 0.59                                     | 19.53            | 27.04               | 22.93               | 23.24 | 19.84 |
| 25500          | 0.59                                     | 19.52            | 22.89               | 28.81               | 29.44 | 19.64 |
| 26000          | 0.58                                     | 19.49            | 20.22               | 39.92               | 33.74 | 21.08 |
| 26500          | 0.60                                     | 19.55            | 18.86               | 25.17               | 24.73 | 25.28 |
| 27000          | 0.63                                     | 19.43            | 17.22               | 21.42               | 21.63 | 30.71 |
| 27500          | 0.65                                     | 19.57            | 16.31               | 20.05               | 20.68 | 26.93 |
| 28000          | 0.64                                     | 19.65            | 16.11               | 21.07               | 21.94 | 21.35 |
| 28500          | 0.64                                     | 19.67            | 16.19               | 22.83               | 23.37 | 18.95 |
| 29000          | 0.64                                     | 19.66            | 16.92               | 23.91               | 23.49 | 18.55 |
| 29500          | 0.66                                     | 19.72            | 18.22               | 21.95               | 21.45 | 21.01 |
| 30000          | 0.69                                     | 19.66            | 19.56               | 20.03               | 19.79 | 25.62 |
| 30500          | 0.69                                     | 19.52            | 20.88               | 20.13               | 20.05 | 32.85 |
| 31000          | 0.69                                     | 19.55            | 21.61               | 21.14               | 21.42 | 23.17 |
| 31500          | 0.68                                     | 19.52            | 21.75               | 25.23               | 25.85 | 19.71 |
| 32000          | 0.68                                     | 19.54            | 23.35               | 28.89               | 30.46 | 18.91 |
| 32500          | 0.70                                     | 19.49            | 26.06               | 24.65               | 25.19 | 21.61 |
| 33000          | 0.73                                     | 19.63            | 20.95               | 21.47               | 21.68 | 22.40 |
| 33500          | 0.74                                     | 19.67            | 18.60               | 19.90               | 20.16 | 21.44 |
| 34000          | 0.75                                     | 19.64            | 16.83               | 20.95               | 20.97 | 19.43 |
| 34500          | 0.73                                     | 19.59            | 15.86               | 24.70               | 23.77 | 21.20 |
| 35000          | 0.73                                     | 19.64            | 18.58               | 40.83               | 32.28 | 34.71 |
| 35500          | 0.74                                     | 19.83            | 33.63               | 25.53               | 26.42 | 17.95 |
| 36000          | 0.79                                     | 19.71            | 20.75               | 20.23               | 20.64 | 14.59 |
| 36500          | 0.83                                     | 19.61            | 16.32               | 17.91               | 18.34 | 14.45 |
| 37000          | 0.85                                     | 19.52            | 13.75               | 18.17               | 18.17 | 15.58 |
| 37500          | 0.84                                     | 19.49            | 12.51               | 19.51               | 19.64 | 19.04 |
| 38000          | 0.82                                     | 19.40            | 12.10               | 24.14               | 23.53 | 24.88 |
| 38500          | 0.82                                     | 19.36            | 12.58               | 32.11               | 29.69 | 19.05 |
| 39000          | 0.83                                     | 19.49            | 14.42               | 30.37               | 29.38 | 14.08 |
| 39500          | 0.85                                     | 19.78            | 20.02               | 24.25               | 24.73 | 12.57 |
| 40000          | 0.87                                     | 19.79            | 21.24               | 21.52               | 21.58 | 12.52 |

<sup>(1)</sup> Mainline loss includes coupling loss

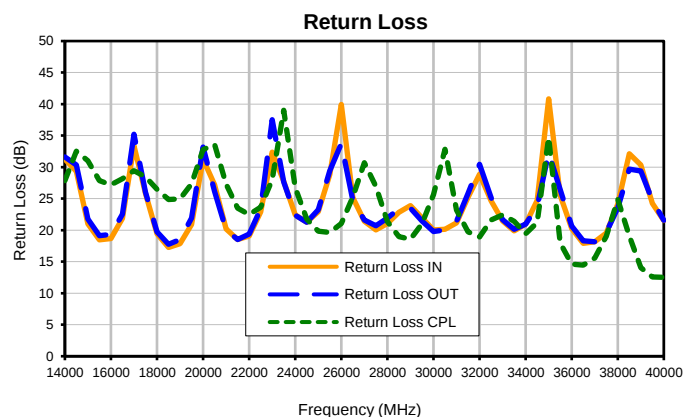
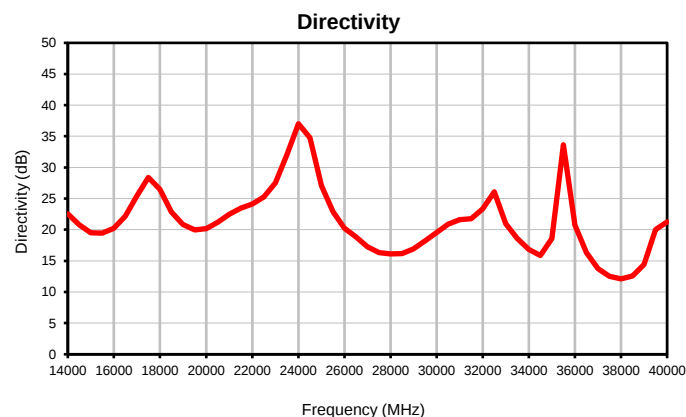
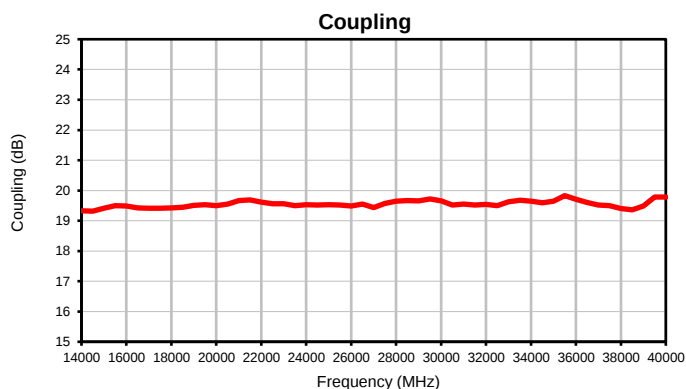
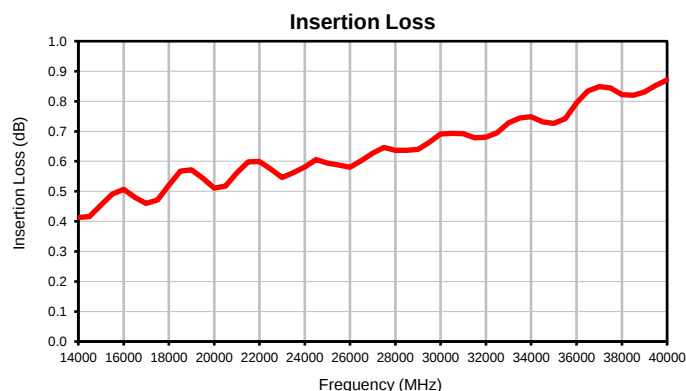


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IF/RF MICROWAVE COMPONENTS

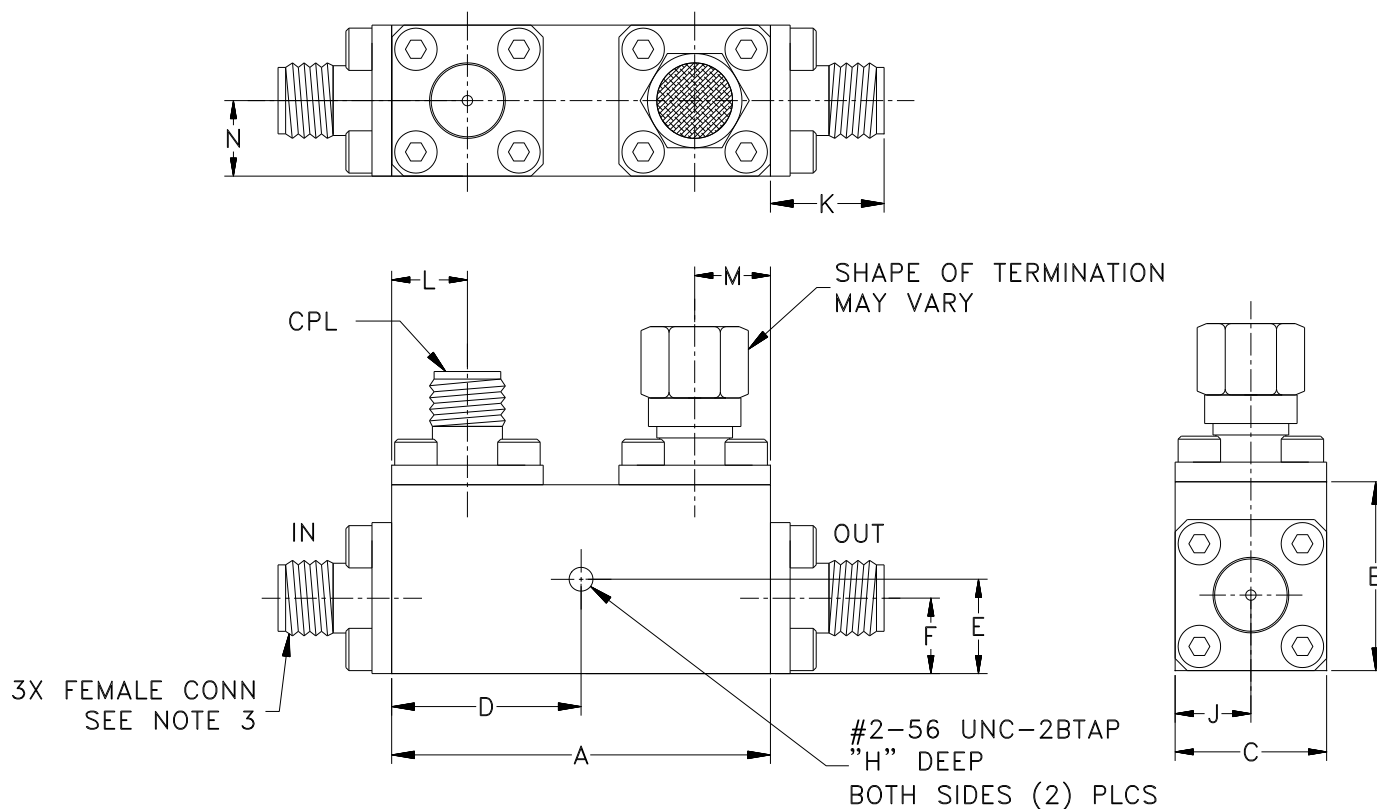
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## Typical Performance Curves



## Outline Dimensions

HT2536-1



| CASE #   | A               | B             | C             | D               | E              | F             | G      | H              | J             | K             |
|----------|-----------------|---------------|---------------|-----------------|----------------|---------------|--------|----------------|---------------|---------------|
| HT2536-1 | 1.25<br>(31.75) | .63<br>(15.9) | .50<br>(12.7) | .625<br>(15.88) | .313<br>(7.94) | .25<br>(6.35) | -<br>- | .120<br>(3.05) | .25<br>(6.35) | .47<br>(12.0) |

| CASE #   | L             | M             | N             | WT. GRAM |
|----------|---------------|---------------|---------------|----------|
| HT2536-1 | .25<br>(6.35) | .25<br>(6.35) | .25<br>(6.35) | 45       |

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

### Notes:

1. Case material: Aluminum alloy.
2. Case finish: Blue Painting, Pantone 286.
3. Refer to the individual model data sheet for the types of connectors available.



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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| 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                                          |
| Thermal Shock              | -55° to 100°C, 25 cycles                                                            | MIL-STD-202, Method 107, Condition A-1 except +100°C instead of 85°C |
| 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                                 |
| Connector Durability       | 500 mating/unmating cycles                                                          | MIL-PRF-39012E, PARAGRAPH 4.6.12                                     |