

# Wideband, DC Pass Directional Coupler

## ZCDC10-V1854+

50Ω 10dB Up to 13W 18 to 50 GHz

### The Big Deal

- Wideband, 18 to 50 GHz
- Excellent Coupling Flatness,  $\pm 0.3$  dB typ.
- Power Handling up to 13W



CASE STYLE: HT2536-1

### Product Overview

The Mini-Circuits ZCDC10-V1854+ wideband directional coupler offers exceptional performance operating over 18 to 50 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 50 GHz, ZCDC10-V1854+ coupler is ideal for most lab testing applications, avoiding the need to switch components for different frequency bands. |
| Excellent Directivity<br>• 20 dB typ. up to 50 GHz            | High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches.   |
| Excellent coupling flatness, $\pm 0.3$ dB typ                 | Excellent coupling flatness over the entire frequency range minimizes the need for compensation circuits in most cases.   |
| Excellent Return Loss (In & Out)<br>• 24 dB typ. up to 50 GHz | Excellent return loss over 18 to 50 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.  
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)



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## ZCDC10-V1854+

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### Maximum Ratings

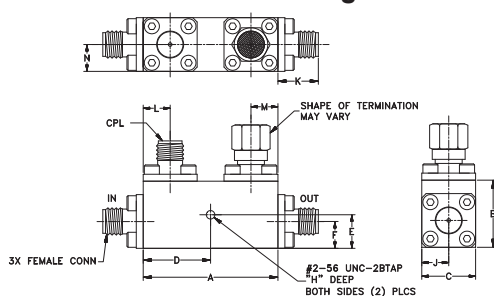
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |
| Supplied Termination* | 1 W            |
| DC Current            | 0.5A           |

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 | —   |

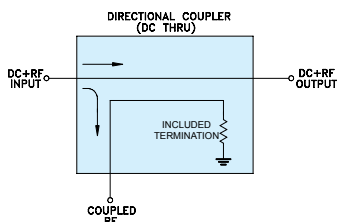
### Outline Drawing



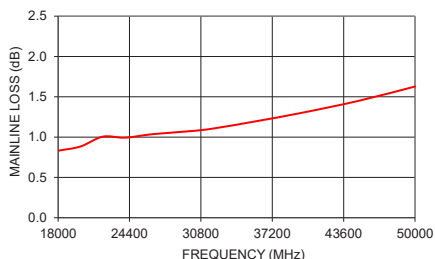
### Outline Dimensions (inch mm)

|       |      |       |       |       |      |       |
|-------|------|-------|-------|-------|------|-------|
| 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 | 0.47  | 0.25  | 0.25  | 0.25 | grams |
| 3.05  | 6.35 | 11.94 | 6.35  | 6.35  | 6.35 | 45    |

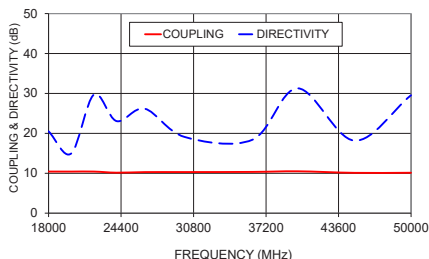
### Electrical Schematic



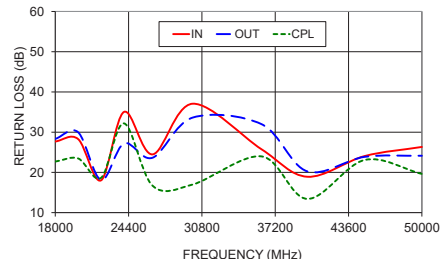
ZCDC10-V1854+ MAINLINE LOSS



ZCDC10-V1854+ COUPLING & DIRECTIVITY



ZCDC10-V1854+ RETURN LOSS



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### Features

- Wide frequency range, 18 to 50 GHz
- Excellent coupling flatness, ±0.3 dB typ.
- Good directivity, 20 dB typ. up to 50 GHz
- Excellent return loss, 24 dB typ. up to 50 GHz
- DC current pass through input to output

### Applications

- 5G
- mobile
- fixed satellite
- lab use



Generic photo used for illustration purposes only

CASE STYLE: HT2536-1

|              |               |
|--------------|---------------|
| Connectors   | Model         |
| 2.4mm Female | ZCDC10-V1854+ |

### +RoHS Compliant

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

### Electrical Specifications at 25°C

| Parameter                  | Frequency (GHz) | Min. | Typ.   | Max. | Units |
|----------------------------|-----------------|------|--------|------|-------|
| Operating Frequency        |                 | 18   |        | 50   | GHz   |
| Nominal Coupling           | 18 - 50         |      | 10±1.3 |      | dB    |
| Coupling Flatness          | 18 - 50         |      | ±0.3   | ±0.7 | dB    |
| Mainline Loss <sup>1</sup> | 18 - 26.5       |      | 1.0    | 1.4  | dB    |
|                            | 26.5 - 40       |      | 1.2    | 1.7  |       |
| Directivity                | 18 - 26.5       | 13   | 22     |      | dB    |
|                            | 26.5 - 40       | 11   | 20     |      |       |
| Return Loss (In & Out)     | 18 - 26.5       |      | 24     |      | dB    |
|                            | 26.5 - 40       |      | 23     |      |       |
| Return Loss (Coupling)     | 18 - 26.5       | 12.7 | 24     |      | dB    |
|                            | 26.5 - 40       | 11.7 | 24     |      |       |
| Input Power <sup>2</sup>   | 18 - 50         |      |        | 13   | W     |

1. Mainline loss includes coupling loss.
2. Up to 25°C, derates linearly to 5W at 100°C.

### Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |       |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
|                 |                           |                      |                  | In               | Out   | Cpl   |
| 18000           | 0.83                      | 10.43                | 20.50            | 27.69            | 28.33 | 22.69 |
| 20000           | 0.88                      | 10.42                | 14.96            | 28.27            | 29.96 | 23.47 |
| 22000           | 1.01                      | 10.43                | 29.70            | 18.03            | 18.10 | 18.66 |
| 24000           | 0.99                      | 10.15                | 23.07            | 35.04            | 27.20 | 32.18 |
| 26500           | 1.04                      | 10.29                | 26.16            | 24.48            | 23.66 | 16.68 |
| 30000           | 1.08                      | 10.30                | 19.11            | 37.07            | 33.63 | 17.00 |
| 36000           | 1.20                      | 10.34                | 18.40            | 25.75            | 32.00 | 23.98 |
| 40000           | 1.31                      | 10.49                | 31.28            | 18.92            | 20.26 | 13.42 |
| 45000           | 1.45                      | 10.11                | 18.18            | 24.06            | 23.87 | 23.09 |
| 50000           | 1.63                      | 10.13                | 29.55            | 26.33            | 24.14 | 19.63 |