

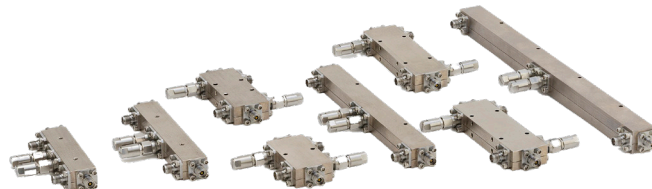
Dual Directional Couplers

ZDDC-Series

50Ω 10, 20 and 30 dB Up to 20W 0.5 to 40 GHz

The Big Deal

- Wideband, 0.5, 1, 2, 6, or 18 to 40 GHz
- Excellent Coupling Flatness, ± 0.3 to ± 1.0 dB typ.
- Power Handling up to 20W



ZDDC Model Series

Product Overview

The Mini-Circuits ZDDC family of wideband Dual-Directional Couplers offers exceptional performance spanning frequencies from 0.5, 1, 2, 6, or 18 to 40 GHz. Available in models with 10, 20, and 30 dB coupling these couplers provide excellent coupling flatness, good directivity, and power handling up to 20 W. They are ideal for lab testing applications as well as for power monitoring over wide bands, among other applications

Key Features

| Feature | Advantages |
|---|---|
| Family of models Wide bandwidth and choice of coupling <ul style="list-style-type: none"> • Up to 40 GHz • 10, 20, or 30 dB coupling | 10 dB coupling: ZDDC10-K5R44W+ (0.5-40 GHz), ZDDC10-K0144+ (1-40 GHz), ZDDC10-K0244+ (2-40 GHz), ZDDC10-K0644+ (6-40 GHz), ZDDC10-K1844+ (18-40 GHz) 20 dB coupling: ZDDC20-K0144+ (1-40 GHz), ZDDC20-K0244+ (2-40 GHz), ZDDC20-K0644+ (6-40 GHz), ZDDC20-K1844+ (18-40 GHz) 30 dB coupling: ZDDC30-K0144+ (1-40 GHz), ZDDC30-K0244+ (2-40 GHz), ZDDC30-K0644+ (6-40 GHz), ZDDC30-K1844+ (18-40 GHz) |
| Dual-Directional Coupler | Ideally suited for simultaneous monitoring of both forward and reverse power of a system and reflectometer measurements. |
| Good Directivity <ul style="list-style-type: none"> • 13 to 22 dB typ. up to 40 GHz | High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches. |
| Excellent coupling flatness <ul style="list-style-type: none"> • ± 0.3 to ± 1.0 dB typ. | Excellent coupling flatness over the entire frequency range minimizes the need for compensation circuits in most cases. |
| Great Return Loss (In & Thru) <ul style="list-style-type: none"> • 17 to 23 dB typ. up to 40 GHz | Good return loss over operating band minimizes undesired reflections and resulting amplitude ripple. |

Wideband, DC Pass

Dual Directional Coupler

ZDDC10-K1844+

50Ω 10 dB Up to 16W 18 to 40 GHz

Features

- Wide frequency range, 18 to 40 GHz
- Excellent coupling flatness, ±0.3 dB typ.
- Great directivity, 17 dB typ. up to 40 GHz
- Excellent return loss, 22 dB typ. up to 40 GHz
- DC current pass through input to output

Applications

- 5G
- Mobile
- Fixed satellite



Generic photo used for illustration purposes only

CASE STYLE: HT3104-3

| Connectors | Model |
|---------------|---------------|
| 2.92mm Female | ZDDC10-K1844+ |

+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 |
|----------------------------|-----------------|------|--------|------|-------|
| Frequency Range | | 18 | | 40 | GHz |
| Coupling | 18 - 40 | - | 10±1.4 | - | dB |
| Coupling Flatness (±) | 18 - 40 | - | ±0.3 | ±0.7 | dB |
| Mainline Loss ¹ | 18 - 26.5 | - | 1.7 | 2.3 | dB |
| | 26.5 - 40 | - | 2.0 | 2.8 | |
| Directivity ² | 18 - 26.5 | 12 | 24 | - | dB |
| | 26.5 - 40 | 10 | 22 | - | |
| Return Loss (In & Thru) | 18 - 26.5 | 12.7 | 29 | - | dB |
| | 26.5 - 40 | 11.7 | 26 | - | |
| Return Loss (Coupling) | 18 - 26.5 | 12.7 | 27 | - | dB |
| | 26.5 - 40 | 11.7 | 25 | - | |
| Input Power ³ | 18 - 40 | - | - | 16 | W |

1. Mainline loss includes coupling loss

2. Directivity (dB) = -RF-OUT to COUP1 (dBm) + RF-IN to COUP1 (dBm) or -RF-IN to COUP2 (dBm) + RF-OUT to COUP2 (dBm)

3. Up to 25°C, derates linearly to 6W at 100°C.

Maximum Ratings

| Parameter | Ratings |
|-----------------------------------|----------------|
| Operating Temperature | -55°C to 125°C |
| Storage Temperature | -55°C to 125°C |
| Supplied Termination ⁴ | 1W |
| DC Current | 0.56A |

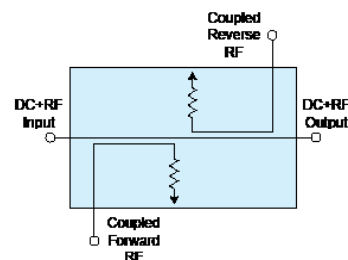
4. Up to 25°C, derates linearly to 325mW at 100°C.

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

Configuration

| Port Markings | Function |
|---------------|---------------------------------|
| IN | RF-IN |
| THRU | RF-OUT |
| COUP1 | Couples power applied at RF-IN |
| COUP2 | Couples power applied at RF-OUT |

Electrical Schematic

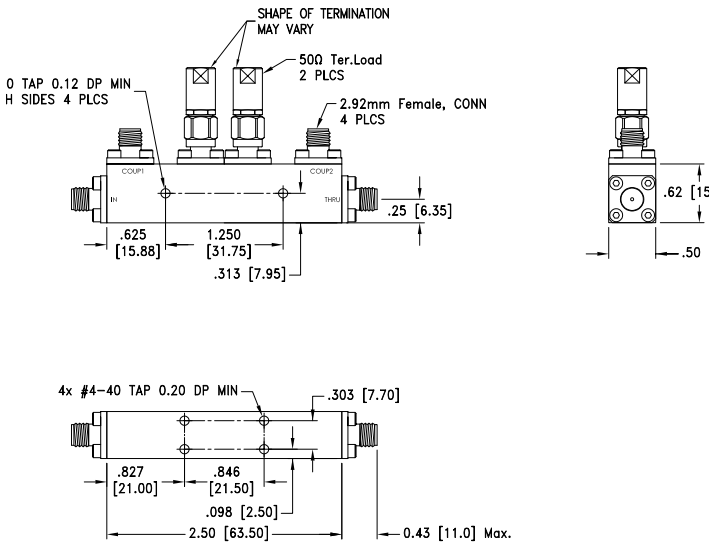


* Mainline is DC Coupled.

* Coupling ports are DC Coupled to internal terminations.



Outline Drawing

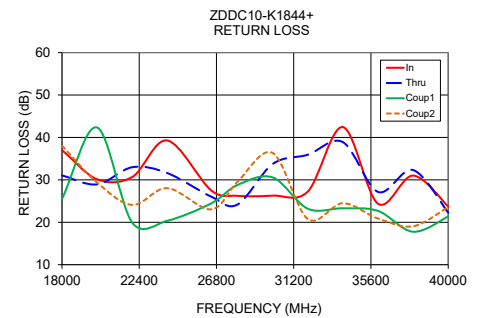
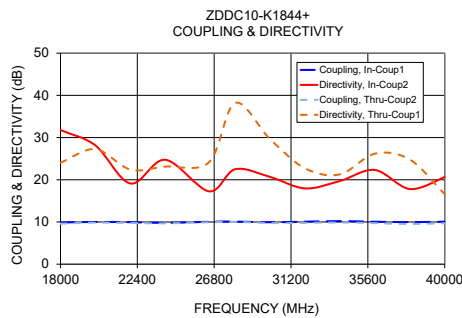
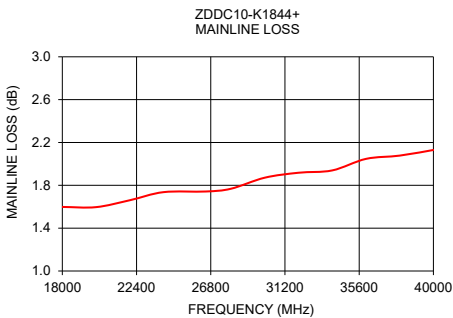


Weight: 80 grams;
Dimensions are in inches (mm). Tolerances: 2 Pl. ±.03; 3 Pl. ±.015

Typical Performance Data

| Frequency (MHz) | Mainline Loss ¹ (dB) | | Coupling (dB) | | Directivity (dB) | | Return Loss (dB) | | | |
|-----------------|---------------------------------|----------|---------------|------------|------------------|----------|------------------|-------|-------|-------|
| | In-Thru1 | In-Coup1 | In-Coup1 | Thru-Coup2 | Thru-Coup1 | In-Coup2 | In | Thru | Coup1 | Coup2 |
| 18000 | 1.60 | 9.87 | 9.59 | 24.06 | 31.80 | 37.02 | 31.04 | 25.54 | 38.04 | |
| 20000 | 1.60 | 10.01 | 9.85 | 27.26 | 28.13 | 30.14 | 28.94 | 42.35 | 29.36 | |
| 22000 | 1.66 | 9.95 | 9.76 | 22.42 | 19.12 | 30.68 | 32.98 | 19.91 | 24.10 | |
| 24000 | 1.74 | 9.78 | 9.67 | 23.12 | 24.74 | 39.29 | 31.60 | 20.36 | 28.05 | |
| 26500 | 1.74 | 10.05 | 9.92 | 24.14 | 17.27 | 27.50 | 26.04 | 24.46 | 23.04 | |
| 28000 | 1.77 | 10.10 | 10.03 | 38.20 | 22.50 | 26.24 | 24.19 | 28.80 | 29.56 | |
| 30000 | 1.87 | 9.93 | 9.75 | 29.62 | 20.68 | 26.28 | 33.74 | 30.58 | 36.35 | |
| 32000 | 1.92 | 10.07 | 9.78 | 22.70 | 17.96 | 27.23 | 35.92 | 23.20 | 20.77 | |
| 34000 | 1.94 | 10.20 | 9.88 | 21.29 | 19.71 | 42.45 | 38.90 | 23.30 | 24.51 | |
| 36000 | 2.05 | 10.05 | 9.73 | 26.19 | 22.33 | 24.38 | 27.16 | 22.69 | 20.89 | |
| 38000 | 2.08 | 9.98 | 9.52 | 24.80 | 17.81 | 31.01 | 32.32 | 17.77 | 19.05 | |
| 40000 | 2.13 | 10.06 | 9.71 | 16.59 | 20.65 | 23.70 | 22.25 | 21.38 | 23.59 | |

1. Mainline loss includes coupling loss



Additional 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
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