

Wideband, DC Pass

# Directional Couplers

ZUDC-Series

50Ω Up to 50W 10 and 20 dB 6 to 18 GHz

## The Big Deal

- Wideband, 6 to 18 GHz
- Excellent Coupling Flatness,  $\pm 0.3$  dB typ.
- Power Handling up to 50W



CASE STYLE: HT3059

## Product Overview

The Mini-Circuits ZUDC family of wideband directional couplers offers exceptional performance spanning frequencies from 6 to 18 GHz. Available in models with 10 and 20 dB coupling, these couplers provide excellent coupling flatness, good directivity, and power handling up to 50W. They are 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 6 to 18 GHz, ZUDC couplers are 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. at 12 GHz</li></ul>	High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches.
Excellent coupling flatness <ul style="list-style-type: none"><li>• <math>\pm 0.3</math> dB typ. up to 18 GHz</li></ul>	Excellent coupling flatness over the entire frequency range eliminates the need for compensation circuits in most cases.
Excellent Return Loss (IN&OUT) <ul style="list-style-type: none"><li>• 31 dB typ. at 12 GHz</li></ul>	Good return loss over 6 to 18 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)



# Wideband, DC Pass Directional Coupler

## ZUDC10-06183-S+

50Ω 10dB Up to 50W 6 to 18 GHz

### Maximum Ratings

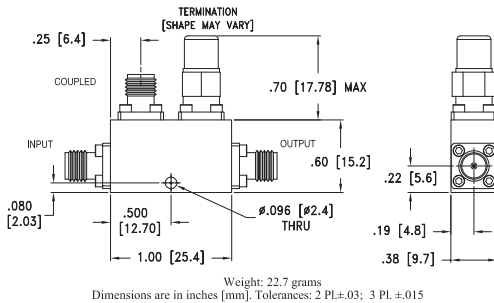
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Supplied Termination	1W
DC Current	1A

Permanent damage may occur if any of these limits are exceeded

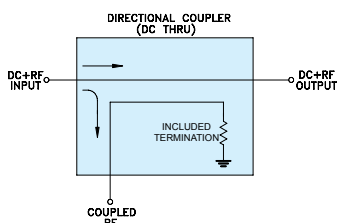
### Coaxial Connections

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

### Outline Drawing



### Electrical Schematic



### Features

- Wide frequency range, 6 to 18 GHz
- Excellent coupling flatness, ±0.3 dB typ.
- Good directivity, 16 dB typ. at 12 GHz
- Excellent return loss, 31 dB typ. at 12 GHz
- DC current pass through input to output

### Applications

- Cellular infrastructure
- Military
- Lab use



Generic photo used for illustration purposes only

CASE STYLE: HT3059

Connectors	Model
SMA-Female	ZUDC10-06183-S+

+RoHS Compliant

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

### Electrical Specifications at 25°C

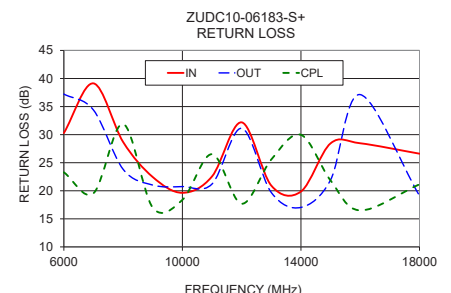
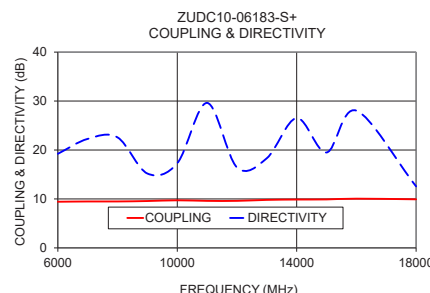
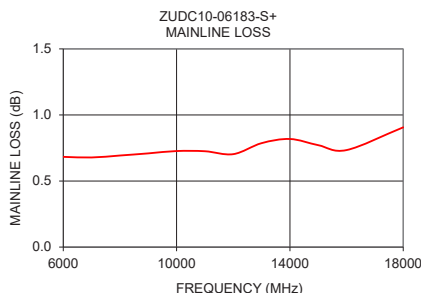
Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Operating Frequency		6		18	GHz
Nominal Coupling	6 – 18	—	10±1.25	—	dB
Coupling Flatness	6 – 18	—	±0.3	±0.9	dB
Mainline Loss <sup>1</sup>	6 – 18	—	0.77	1.05	dB
Directivity	6 – 18	12	21	—	dB
Return Loss (In & Out)	6 – 18	15.5	24	—	dB
Return Loss (Coupling)	6 – 18	13.9	22	—	dB
Input Power <sup>2</sup>	6 – 18	—	—	50	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 <sup>1</sup> (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
				In	Out	Cpl
6000	0.68	9.43	19.23	30.28	37.23	23.28
7000	0.68	9.49	22.27	39.13	34.38	19.57
8000	0.69	9.49	22.57	28.68	23.82	31.91
9000	0.71	9.58	15.19	22.44	21.01	16.99
10000	0.73	9.73	17.30	19.64	20.75	18.38
11000	0.73	9.61	29.62	22.56	21.20	26.52
12000	0.70	9.61	16.45	32.19	31.13	17.69
13000	0.79	9.81	18.32	20.92	19.68	25.58
14000	0.82	9.88	26.52	19.87	17.04	29.96
15000	0.77	9.90	19.50	28.45	21.94	21.83
16000	0.73	10.06	28.04	28.46	37.13	16.50
18000	0.91	9.93	12.57	26.61	19.11	21.15

1. Mainline loss includes coupling loss.



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# Directional Coupler

# ZUDC10-06183-S+

## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS <sup>(1)</sup> (dB)	COUPLING (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		
				IN	OUT	CPL
6000	0.68	9.43	19.23	19.23	37.23	23.28
6200	0.69	9.43	18.99	18.99	48.52	21.27
6400	0.68	9.44	19.22	19.22	45.13	20.17
6600	0.68	9.44	19.46	19.46	39.34	19.40
6800	0.68	9.47	20.50	20.50	36.82	19.05
7000	0.68	9.49	22.27	22.27	34.38	19.57
7200	0.68	9.50	25.23	25.23	31.54	20.92
7400	0.68	9.51	29.95	29.95	29.26	23.12
7600	0.68	9.51	32.00	32.00	27.23	26.61
7800	0.69	9.51	26.79	26.79	25.35	32.58
8000	0.69	9.49	22.57	22.57	23.82	31.91
8200	0.70	9.47	19.69	19.69	22.70	25.32
8400	0.71	9.46	17.70	17.70	21.78	21.46
8600	0.72	9.47	16.58	16.58	21.30	19.52
8800	0.70	9.54	16.09	16.09	21.15	18.33
9000	0.71	9.58	15.19	15.19	21.01	16.99
9200	0.71	9.63	14.82	14.82	20.97	16.25
9400	0.72	9.68	14.78	14.78	21.02	16.01
9600	0.72	9.72	15.11	15.11	20.88	16.29
9800	0.73	9.73	15.92	15.92	20.82	17.07
10000	0.73	9.73	17.30	17.30	20.75	18.38
10200	0.73	9.71	19.28	19.28	20.61	20.46
10400	0.74	9.67	22.20	22.20	20.32	24.04
10600	0.74	9.64	27.59	27.59	20.34	31.42
10800	0.73	9.62	38.92	38.92	20.49	37.28
11000	0.73	9.61	29.62	29.62	21.20	26.52
11500	0.71	9.62	19.37	19.37	25.28	18.91
12000	0.70	9.61	16.45	16.45	31.13	17.69
12500	0.73	9.62	16.27	16.27	23.25	19.86
13000	0.79	9.81	18.32	18.32	19.68	25.58
13500	0.81	9.90	26.05	26.05	17.59	29.51
14000	0.82	9.88	26.52	26.52	17.04	29.96
14500	0.81	9.85	20.65	20.65	18.06	35.01
15000	0.77	9.90	19.50	19.50	21.94	21.83
15500	0.73	10.01	22.08	22.08	30.67	17.23
16000	0.73	10.06	28.04	28.04	37.13	16.50
16500	0.75	10.01	20.68	20.68	35.24	19.16
17000	0.78	9.88	15.97	15.97	26.39	27.85
17500	0.84	9.81	13.91	13.91	21.17	30.79
18000	0.91	9.93	12.57	12.57	19.11	21.15

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



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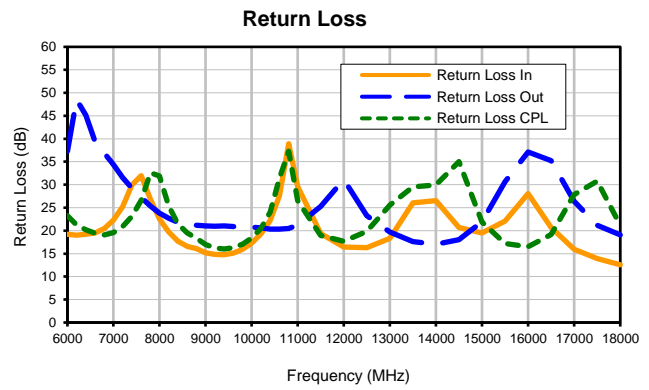
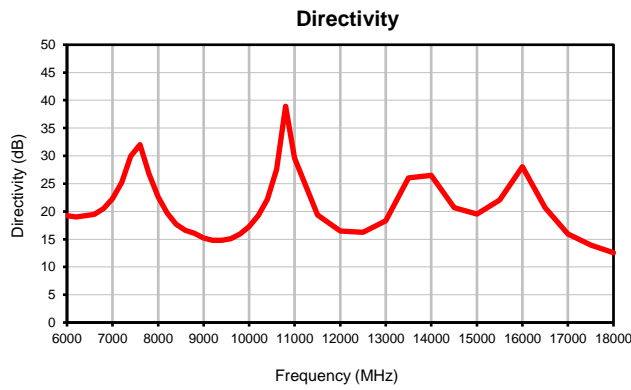
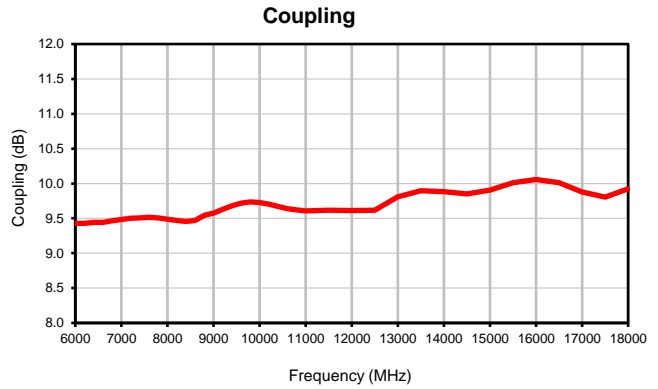
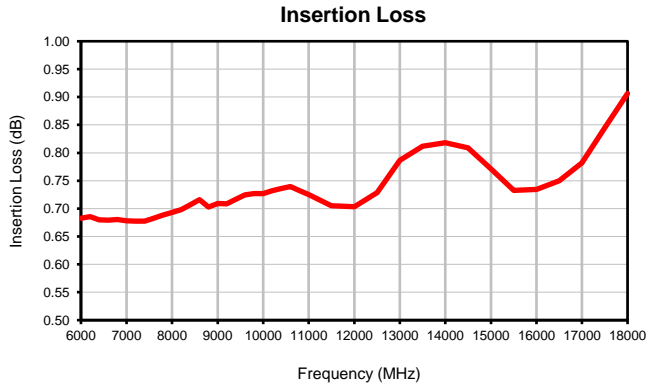
IF/RF MICROWAVE COMPONENTS

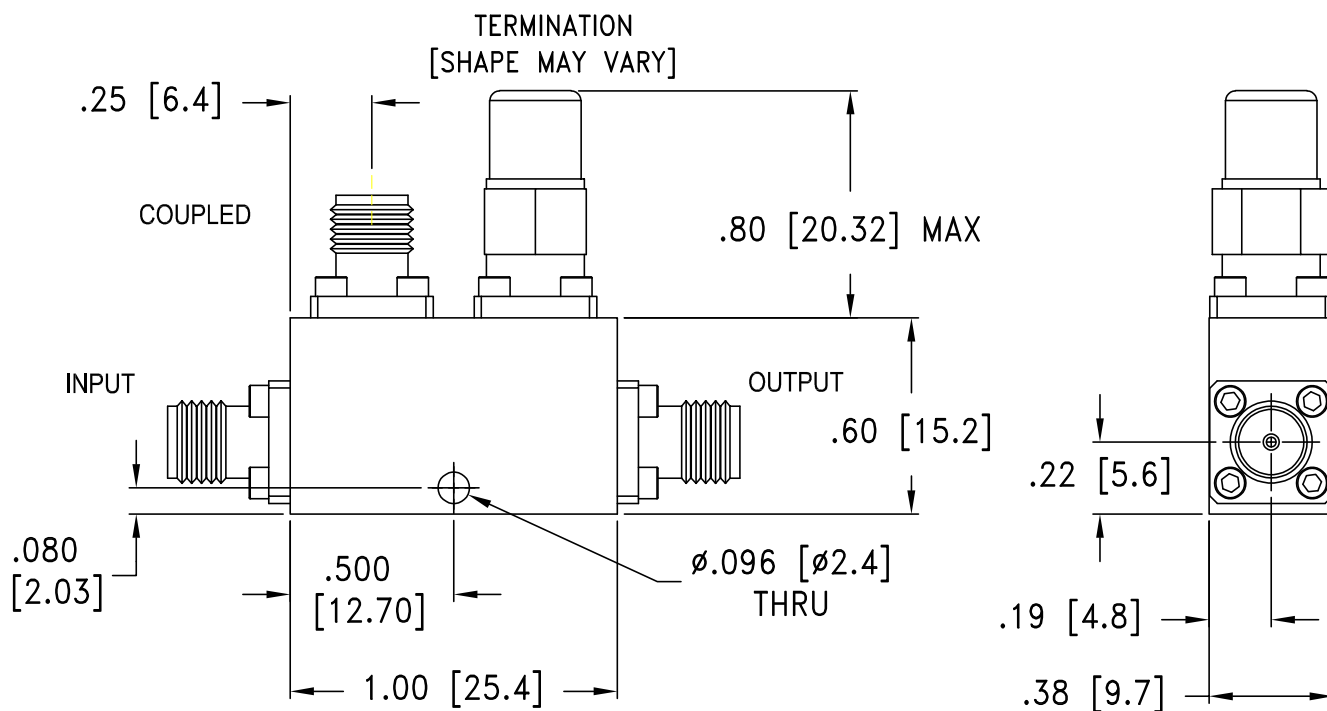
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 ZUDC10-06183-S+  
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# Directional Coupler

## Typical Performance Curves

ZUDC10-06183-S+





Weight: 22.7 grams

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

### Notes:

1. Case material: Aluminum alloy.
2. Case finish: Pantone 286.

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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 +85 °C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C