Ultra-Wideband, DC Pass

Directional Coupler ZUDC10-83-S+

50Ω 10dB Up to 20W 0.3 to 8 GHz

CASE STYLE: HT1967-1

The Big Deal

- Ultra-wideband, 0.3 to 8 GHz
- Excellent Coupling Flatness, ±0.8 dB typ.
- Power Handling up to 20W

Product Overview

Mini-Circuits' ZUDC10-83-S+ is an ultra-wideband directional coupler which offers exceptional performance spanning frequencies from 0.3 to 8 GHz. It provides excellent coupling flatness, good directivity, and power handling up to 20W. Ideal for lab testing applications as well as for power monitoring over wide bands, among other applications.

Key Features

Feature	Advantages
Ultra-wide bandwidth	With a bandwidth spanning 0.3 to 8 GHz, the ZUDC10-83-S+ coupler is ideal for most lab testing applications, avoiding the need to switch components for different frequency bands.
Excellent Directivity • 24 dB at 6 GHz • 22 dB at 8 GHz	High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches.
Excellent coupling flatness, ±0.8 dB typ.	Excellent coupling flatness over the entire frequency range eliminates the need for compensation circuits in most cases.

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Directional Coupler

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ZUDC10-83-S+

Generic photo used for illustration purposes only

CASE STYLE: HT1967-1

Connectors	Model
SMA	ZUDC10-83-S+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 85°C
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	—

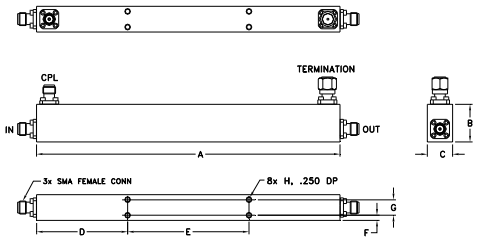
Features

- ultra wide frequency range, 0.3 to 8 GHz
- good directivity, 24dB typ.
- good VSWR, 1.15 typ.
- DC current pass through input to output

Applications

- cellular
- lab use
- WiMax
- ISM
- GSM
- PCN

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E
6.00	0.73	0.50	1.8	2.4
152.4	18.54	12.70	45.72	60.96

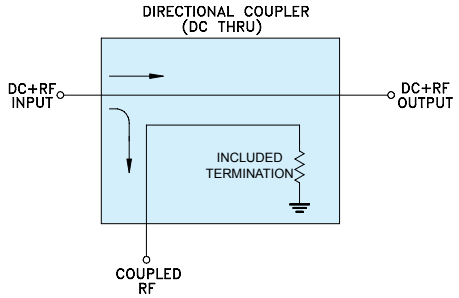
F	G	H	wt
0.10	0.3	#4-40	grams
2.54	7.62	UNC-2B	120

Electrical Specifications at 25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Operating Frequency		0.3		8	GHz
Nominal Coupling	0.3 - 8	—	10±1.0	—	dB
Coupling Flatness	0.3 - 8	—	±0.8	±1.2	dB
Mainline Loss[1,2]	0.3 - 8	—	0.9	1.3	dB
Directivity[3]	0.3 - 6 6 - 8	20 18	24 22	— —	dB
Return Loss (All ports)	0.3 - 6 6 - 8	20.8 17.7	24 22	— —	dB
Input Power[4]	0.3 - 8	—	—	20	W

1. Doesn't include theoretical coupling loss.
2. Mainline loss max. degrades to 1.5 dB at 85°C
3. Directivity min. degrades to 16 dB a 85°C from 2-8 GHz.
4. Peak power max. 3kw (1µ, 2% duty)

Electrical Schematic



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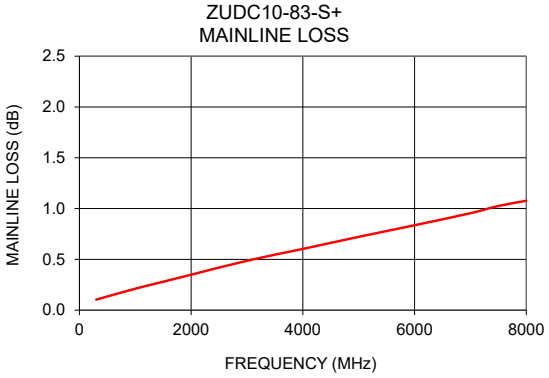
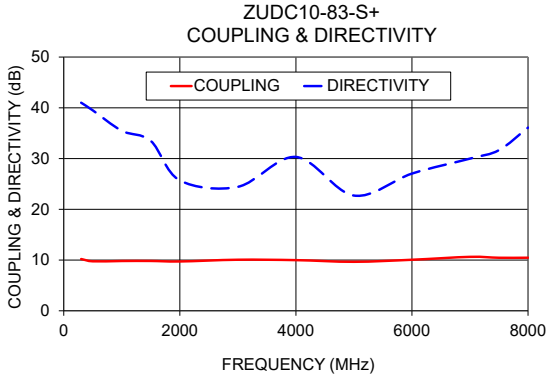
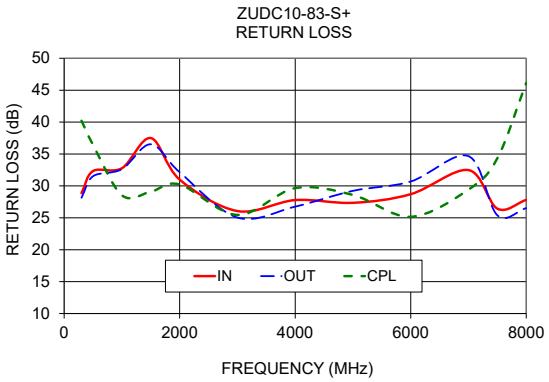
Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Return Loss (dB) Out	Return Loss (dB) Cpl
300	0.10	10.20	41.01	28.87	28.14	40.21
500	0.13	9.75	39.50	32.33	31.52	36.44
1000	0.21	9.81	35.48	32.77	32.63	28.53
1500	0.28	9.82	33.48	37.50	36.53	29.09
2000	0.35	9.72	25.70	30.99	32.14	30.23
3000	0.49	10.06	24.43	26.06	25.04	25.45
4000	0.60	9.98	30.32	27.78	26.75	29.66
5000	0.72	9.65	22.71	27.35	29.23	28.58
6000	0.84	10.06	27.04	28.70	30.69	25.16
7000	0.95	10.63	29.99	32.48	34.67	29.42
7500	1.03	10.45	31.66	26.43	25.40	34.34
8000	1.08	10.46	36.10	27.81	26.52	46.14

1. Doesn't include theoretical coupling loss. Mainline loss= insertion loss - theoretical loss (0.458 dB).







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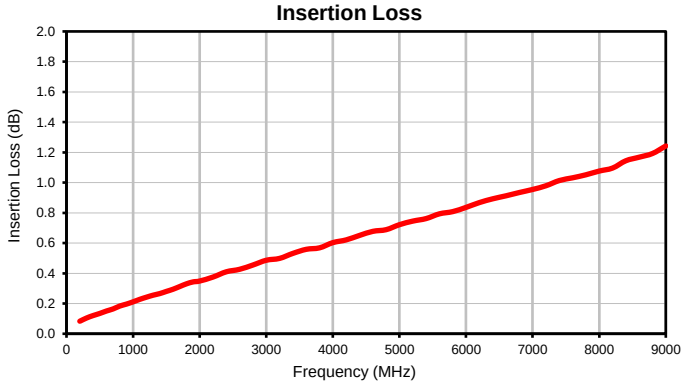
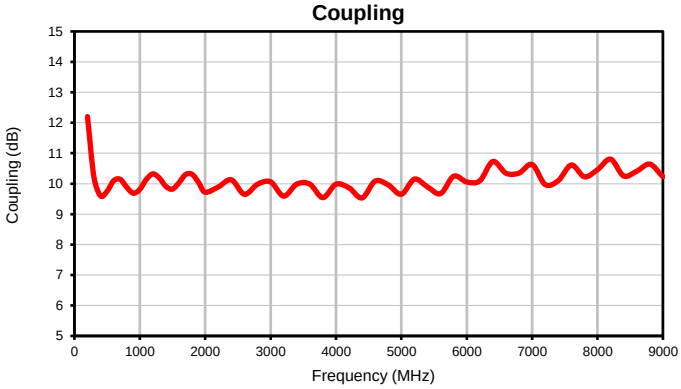
Directional Coupler ZUDC10-83-S+

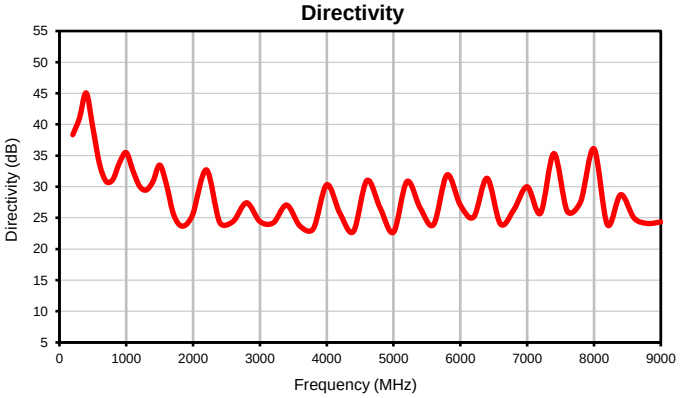
Typical Performance Data

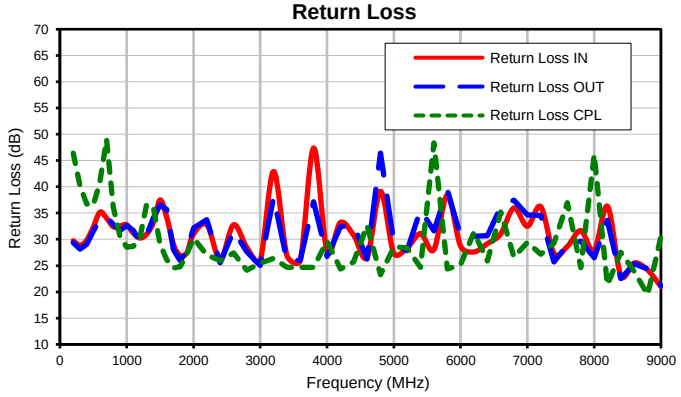
FREQUENCY (MHz)	INSERTION LOSS (dB)	COUPLING (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		
				IN	OUT	CPL
200	0.08	12.20	38.34	29.73	29.37	46.41
300	0.10	10.20	41.01	28.87	28.14	40.21
400	0.12	9.60	45.06	29.82	29.03	36.72
500	0.13	9.75	39.50	32.33	31.52	36.44
600	0.15	10.10	33.65	35.18	33.80	40.85
700	0.16	10.14	30.84	34.01	34.28	49.01
800	0.18	9.88	31.17	32.40	32.83	36.10
900	0.20	9.69	33.87	32.52	31.68	30.58
1000	0.21	9.81	35.48	32.77	32.63	28.53
1100	0.23	10.14	32.58	31.18	31.64	28.70
1200	0.24	10.32	30.07	30.26	29.43	30.54
1300	0.26	10.18	29.47	31.00	30.78	36.60
1400	0.27	9.91	30.84	33.18	34.07	36.19
1500	0.28	9.82	33.48	37.50	36.53	29.09
1600	0.29	10.03	30.42	34.20	35.72	26.10
1700	0.31	10.30	25.82	29.03	28.03	24.52
1800	0.33	10.31	23.84	26.94	25.95	24.76
1900	0.34	10.04	23.95	27.39	27.85	27.20
2000	0.35	9.72	25.70	30.99	32.14	30.23
2200	0.38	9.89	32.71	32.80	33.77	27.05
2400	0.41	10.13	24.25	26.15	25.50	25.92
2600	0.43	9.65	24.43	32.77	31.65	27.42
2800	0.45	9.98	27.42	28.45	27.68	24.10
3000	0.49	10.06	24.43	26.06	25.04	25.45
3200	0.50	9.59	24.20	42.92	37.99	26.39
3400	0.53	9.99	27.06	26.92	25.87	24.66
3600	0.56	9.99	23.68	25.99	25.99	24.69
3800	0.57	9.54	23.26	47.39	37.13	24.64
4000	0.60	9.98	30.32	27.78	26.75	29.66
4200	0.62	9.86	25.69	33.20	32.40	24.35
4400	0.65	9.53	22.81	30.76	32.79	25.69
4600	0.68	10.09	30.99	26.59	26.25	32.66
4800	0.69	9.96	26.58	39.13	46.43	23.24
5000	0.72	9.65	22.71	27.35	29.23	28.58
5200	0.75	10.15	30.83	28.35	27.86	28.39
5400	0.76	9.90	26.56	31.10	35.61	24.68
5600	0.79	9.67	23.92	28.03	31.60	48.37
5800	0.81	10.25	31.89	38.40	39.37	24.37
6000	0.84	10.06	27.04	28.70	30.69	25.16
6200	0.87	10.09	25.14	27.59	30.56	31.29
6400	0.89	10.73	31.36	29.18	30.71	25.91
6600	0.91	10.34	24.01	31.02	36.17	35.20
6800	0.93	10.35	26.29	35.98	37.45	26.62
7000	0.95	10.63	29.99	32.48	34.67	29.42
7200	0.98	9.97	25.75	36.23	34.52	27.14
7400	1.01	10.10	35.33	27.30	25.71	29.23
7600	1.03	10.61	26.06	28.67	28.91	36.96
7800	1.05	10.23	27.60	31.66	29.69	24.59
8000	1.08	10.46	36.10	27.81	26.52	46.14
8200	1.10	10.81	23.91	36.29	33.64	21.31
8400	1.14	10.25	28.73	23.09	22.53	27.50
8600	1.17	10.41	24.96	25.50	25.32	23.86
8800	1.19	10.64	24.11	24.18	24.38	19.47
9000	1.24	10.23	24.35	21.02	21.19	30.50

Typical Performance Curves



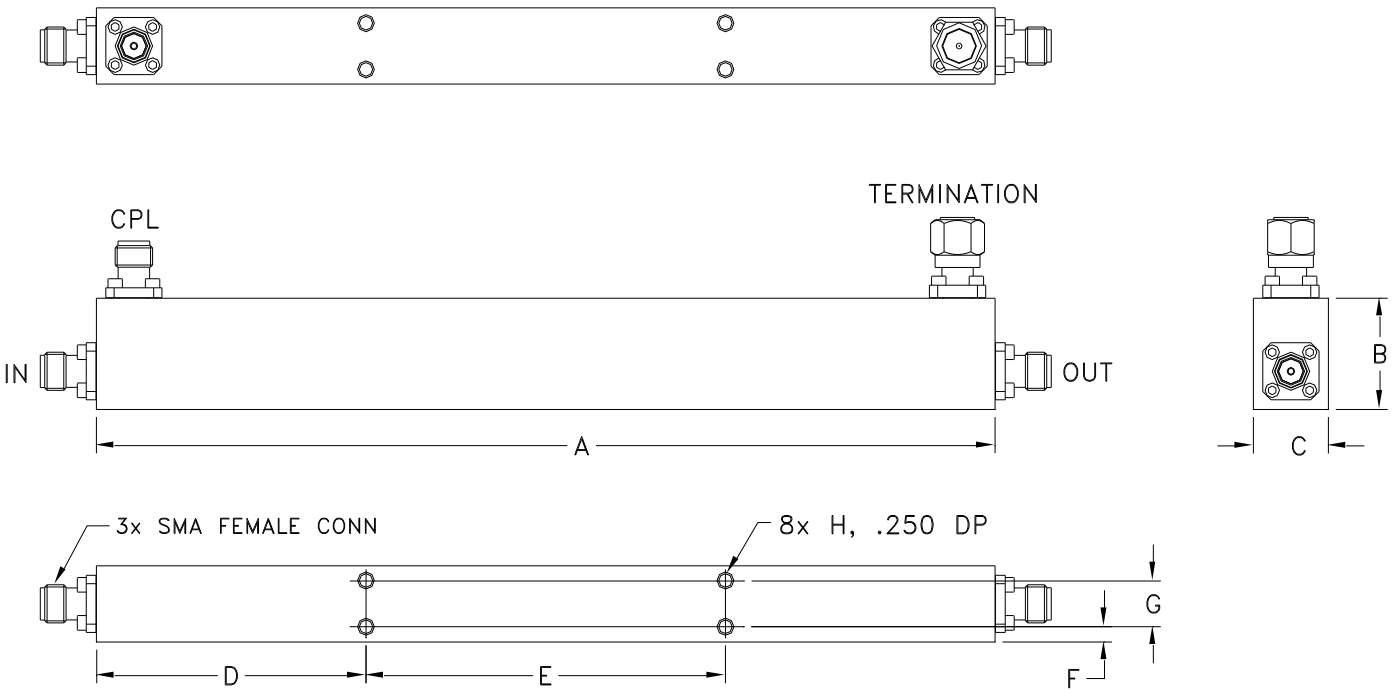






Case Style HT

Outline Dimensions HT1967-1



CASE #	A	B	C	D	E	F	G	H	J	K
HT1967-1	6.00 (152.40)	.73 (18.54)	.50 (12.70)	1.80 (45.72)	2.400 (60.96)	.10 (2.54)	.300 (7.62)	#4-40 UNC-2B	-- --	-- --

CASE #	L	M	WT. GRAM
HT1967-1	-- --	-- --	120.0

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish: Painting. Color: Blue, Pantone 286.

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Mini-Circuits

Environmental Specifications ENV03T3

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 85° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215

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