Wideband, DC Pass

Directional Coupler ZCDC20-01203-S+

50Ω 20dB Up to 20W 1 to 20 GHz

The Big Deal

- Wideband, 1 to 20 GHz
- Excellent Coupling Flatness, ±0.26 dB typ.
- Power Handling up to 20W

CASE STYLE: HT2679-N

Product Overview

The Mini-Circuits ZCDC20-01203-S+ wideband directional coupler offers exceptional performance operating over 1 to 20 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 1 to 20 GHz, ZCDC20-01203-S+ coupler is ideal for most lab testing applications, avoiding the need to switch components for different frequency bands.
Excellent Directivity • 19 dB typ. up to 20 GHz	High directivity allows sampling of input powers with minimal detrimental effects due to input mismatches.
Excellent coupling flatness, ±0.26 dB typ	Excellent coupling flatness over the entire frequency range minimizes the need for compensation circuits in most cases.
Good Return Loss (In & Out) • 21 dB typ. up to 20 GHz	Good return loss over 1 to 20 GHz minimizes undesired reflections and resulting amplitude ripple.

Notes
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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

Wideband, DC Pass

Directional Coupler

ZCDC20-01203-S+

50Ω 20dB Up to 20W 1 to 20 GHz

Generic photo used for illustration purposes only

CASE STYLE: HT2679-N

Connectors	Model
SMA Female	ZCDC20-01203-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 100°C
Storage Temperature	-55°C to 100°C
Supplied Termination*	1W
DC Current	0.63A

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	—

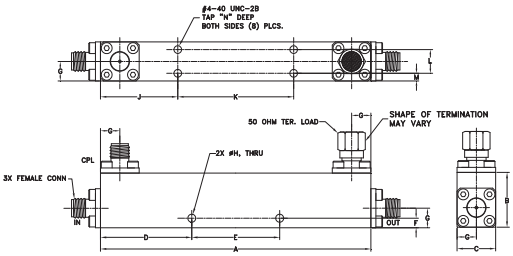
Features

- Wide frequency range, 1 to 20 GHz
- Good coupling flatness, ±0.26 dB typ.
- Good directivity, 19 dB typ. up to 20 GHz
- Good return loss, 21 dB typ. up to 20 GHz
- DC current pass through input to output

Applications

- 5G
- Mobile
- Fixed satellite
- Lab use

Outline Drawing

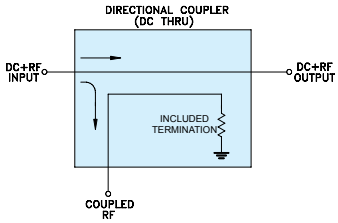


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
3.50	0.70	0.50	1.181	1.138	0.122	0.25
88.90	17.78	12.70	30.00	28.91	3.10	6.35

H	J	K	L	M	N	wt
0.102	1.00	1.50	0.303	0.098	0.2	grams
2.59	25.40	38.10	7.70	2.5	5.08	80

Electrical Schematic



Electrical Specifications at 25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Operating Frequency		1		20	GHz
Nominal Coupling	1 - 20	-	20±1.35	-	dB
Coupling Flatness (±)	1 - 20	-	±0.26	±0.35	dB
Mainline Loss[1]	1 - 8	-	0.3	0.7	dB
	8 - 20	-	0.6	1.0	
Directivity	1 - 8	17	33	-	dB
	8 - 20	14	25	-	
Return Loss (In & Out)	1 - 8	17.6	38	-	dB
	8 - 20	16.5	29	-	
Return Loss (Coupling)	1 - 8	17.6	33	-	dB
	8 - 20	16.5	26	-	
Input Power[2]	1 - 20	-	-	20	W

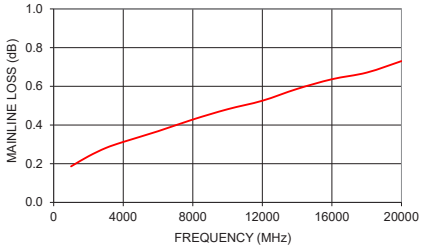
1. Mainline loss includes coupling loss
2. up to 25°C, derates linearly to 18W at 100°C.

Typical Performance Data

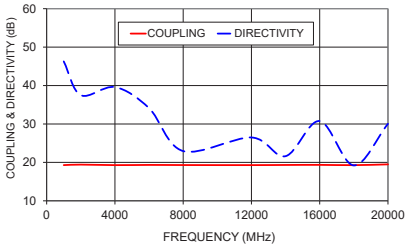
Frequency (MHz)	Mainline Loss[1] (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB) In	Return Loss (dB) Out	Return Loss (dB) Cpl
1000	0.19	19.29	46.27	69.07	39.54	37.70
2000	0.24	19.42	37.49	39.42	47.03	36.53
4000	0.31	19.29	39.59	40.95	41.55	34.67
6000	0.37	19.34	34.12	38.68	38.68	27.80
8000	0.43	19.31	22.95	35.10	37.44	25.82
12000	0.53	19.29	26.49	38.40	40.68	23.15
14000	0.59	19.33	21.62	23.84	24.34	18.92
16000	0.64	19.36	30.76	22.19	21.71	18.81
18000	0.67	19.28	19.21	22.36	22.73	23.16
20000	0.73	19.49	30.04	21.06	21.60	24.52

1. Mainline loss includes coupling loss

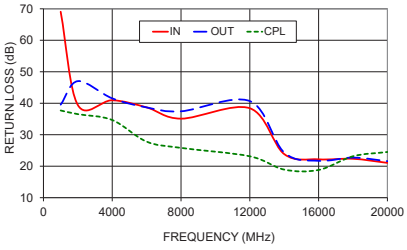
ZCDC20-01203-S+
MAINLINE LOSS



ZCDC20-01203-S+
COUPLING & DIRECTIVITY



ZCDC20-01203-S+
RETURN LOSS



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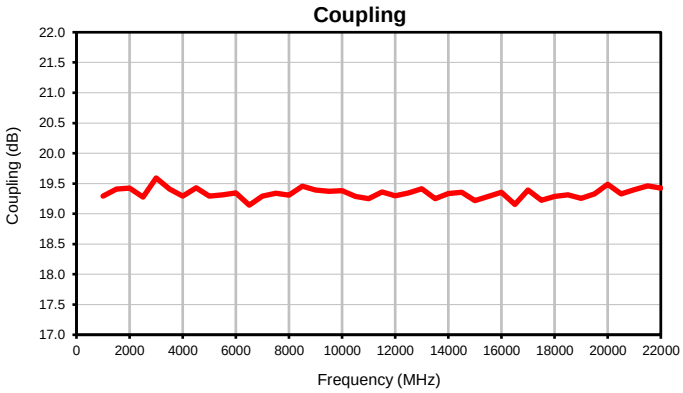
Directional Coupler ZCDC20-01203-S+

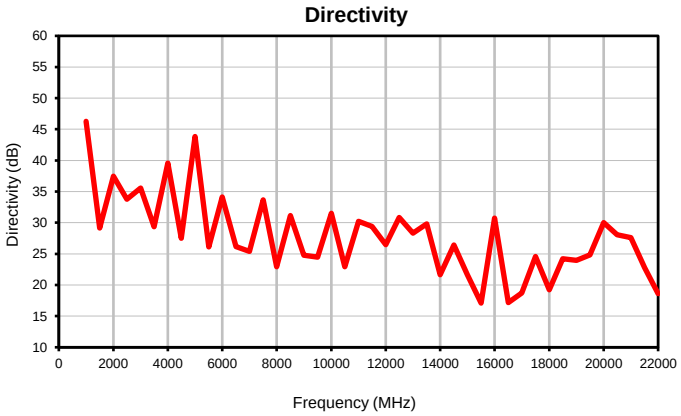
Typical Performance Data

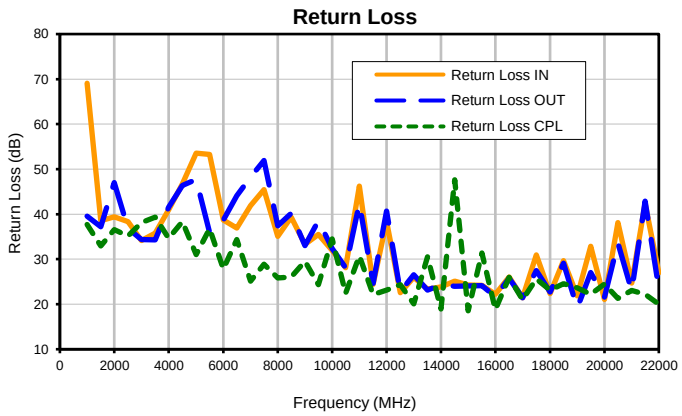
FREQ. (MHz)	INSERTION LOSS[1] (dB)	COUPLING (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		
				IN	OUT	CPL
1000	0.19	19.29	46.27	69.07	39.54	37.70
1500	0.21	19.41	29.15	38.54	37.22	32.92
2000	0.24	19.42	37.49	39.42	47.03	36.53
2500	0.26	19.27	33.76	38.37	36.86	35.14
3000	0.28	19.59	35.56	34.18	34.40	38.11
3500	0.30	19.41	29.37	35.78	34.28	39.35
4000	0.31	19.29	39.59	40.95	41.55	34.67
4500	0.32	19.43	27.50	46.75	46.39	38.35
5000	0.34	19.29	43.85	53.52	47.74	31.03
5500	0.35	19.31	26.09	53.26	35.95	36.80
6000	0.37	19.34	34.12	38.68	38.68	27.80
6500	0.38	19.14	26.15	36.89	44.08	34.39
7000	0.40	19.29	25.38	41.90	48.20	25.09
7500	0.41	19.34	33.68	45.45	51.92	28.89
8000	0.43	19.31	22.95	35.10	37.44	25.82
8500	0.44	19.45	31.17	39.35	40.18	26.08
9000	0.46	19.39	24.78	33.27	32.99	29.54
9500	0.47	19.37	24.47	35.49	38.57	24.37
10000	0.48	19.38	31.51	31.96	32.39	34.51
10500	0.50	19.29	22.92	28.11	28.12	22.45
11000	0.50	19.25	30.20	46.22	42.40	30.74
11500	0.53	19.36	29.43	24.43	24.63	22.16
12000	0.53	19.29	26.49	38.40	40.68	23.15
12500	0.56	19.34	30.82	22.57	22.75	24.31
13000	0.55	19.42	28.34	25.99	26.55	20.10
13500	0.58	19.25	29.83	23.31	23.14	30.53
14000	0.59	19.33	21.62	23.84	24.34	18.92
14500	0.59	19.35	26.44	25.16	23.99	47.63
15000	0.61	19.22	21.66	24.24	24.05	18.54
15500	0.62	19.29	17.09	24.21	24.14	31.39
16000	0.64	19.36	30.76	22.19	21.71	18.81
16500	0.63	19.16	17.17	26.04	25.78	26.01
17000	0.66	19.39	18.74	21.45	21.42	20.98
17500	0.64	19.22	24.59	30.95	27.46	25.63
18000	0.67	19.28	19.21	22.36	22.73	23.16
18500	0.64	19.31	24.23	29.69	29.08	24.58
19000	0.63	19.25	23.98	21.82	19.17	23.65
19500	0.65	19.33	24.85	32.87	27.03	22.24
20000	0.73	19.49	30.04	21.06	21.60	24.52
20500	0.72	19.33	28.07	38.13	33.61	21.26
21000	0.75	19.40	27.60	24.73	22.99	23.07
21500	0.75	19.46	22.78	42.40	42.90	22.20
22000	0.77	19.43	18.59	26.96	23.52	20.02

[1] Mainline loss includes coupling loss

Typical Performance Curves



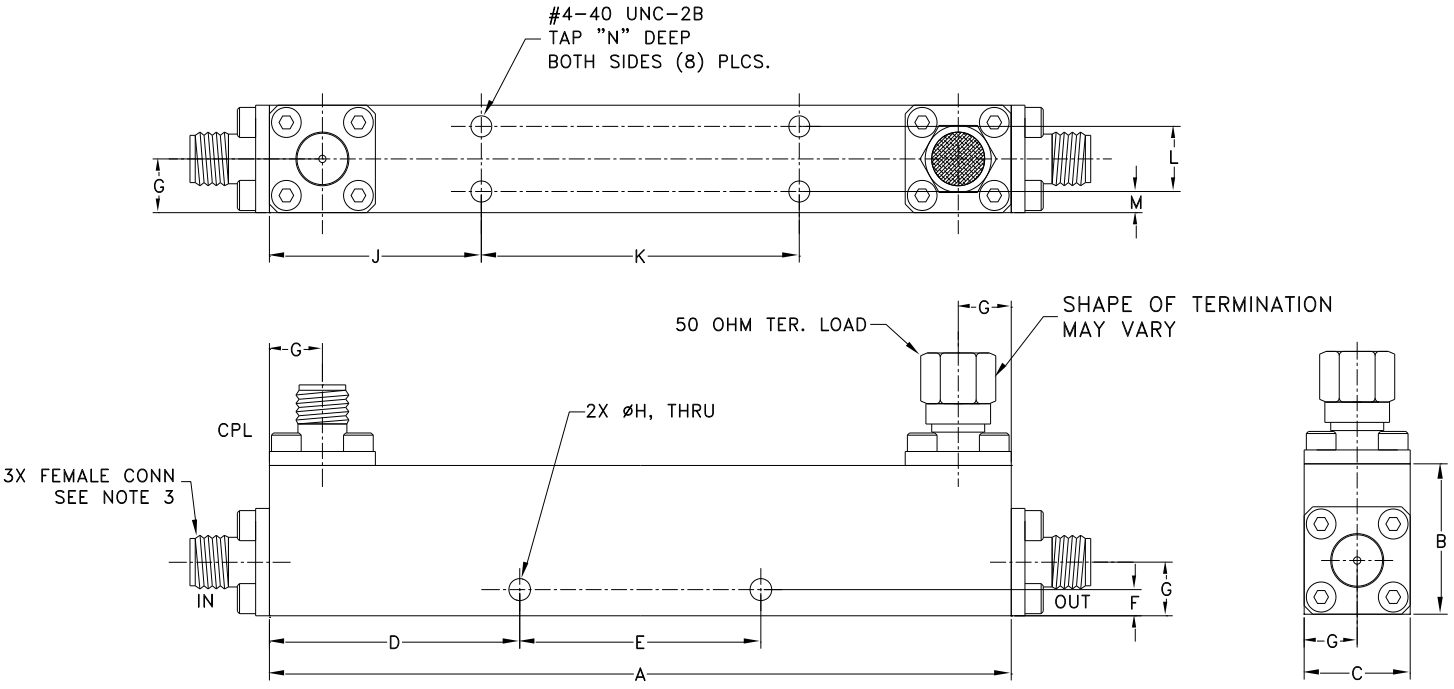




Case Style HT

HT2679-N

Outline Dimensions



CASE #	A	B	C	D	E	F	G	H	J	K
HT2679-N	3.50 (88.90)	.70 (17.78)	.50 (12.70)	1.181 (30.00)	1.138 (28.90)	.122 (3.10)	.25 (6.35)	.102 (2.60)	1.000 (25.40)	1.500 (38.10)

CASE #	L	M	N	WT. GRAM
HT2679-N	.0.303 (7.70)	0.098 (2.50)	0.20 (5.08)	80

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish: Nickel Plating.
3. Refer to the individual model data sheet for the type of connectors available.

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Mini-Circuits

Environmental Specifications **ENV102**

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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C 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

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