

20dB DC Pass

High Power Bi-Directional Coupler ZGBDC20-33HPD+

50Ω Up to 250W 300 to 3000 MHz

The Big Deal

- Wideband, 300 to 3000 MHz
- High power handling, up to 250W
- High directivity, 20 dB
- Excellent VSWR, 1.22:1
- Rugged, IP67 weatherproof case



CASE STYLE: HT1412-1

Product Overview

Mini-Circuits' ZGBDC20-33HPD+ is a high-power, wideband bi-directional coupler providing 20 dB coupling with good coupling flatness across the 300 to 3000 MHz frequency range. This model is capable of handling up to 250W RF input power and passing up to 3.0A DC current from input to output. 20 dB typical directivity allows accurate sampling of signal through the coupled port, and low mainline loss (0.15 dB typical) provides excellent transmission of signal power from input to output. The coupler comes housed in a rugged, IP67 weatherproof case (5.58 x 2.50 x 1.00") with 7/16 DIN connectors.

Key Features

Feature	Advantages
Wideband, 300 to 3000 MHz	One device supports a broad range of applications.
Very high input power handling: • 250W, 300 to 2700 MHz • 160W, 2700 to 3000 MHz	Suitable for high power applications such as monitoring high-power transmitter outputs or feedback linearization of HPAs.
Good directivity, 20 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Flat coupling: • ± 0.8 dB, 300 to 2700 MHz • ± 2.9 dB, 2700 to 3000 MHz	Provides consistent coupling performance across frequency.
Low mainline loss, 0.8 dB typ.	Provides excellent through-path signal power transmission.
Good VSWR. 1.22:1 typ.	Well-matched for 50Ω systems with minimal signal reflection.
DC current passing up to 3.0A	Suitable for use in systems where DC power is needed through the RF line.
Rugged IP67 weatherproof case	Enables reliable use for outdoor systems in harsh operating conditions.

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



20dB DC Pass

NON-CATALOG

High Power Bi-Directional Coupler

ZGBDC20-33HPD+

50Ω

Up to 250W

300 to 3000 MHz

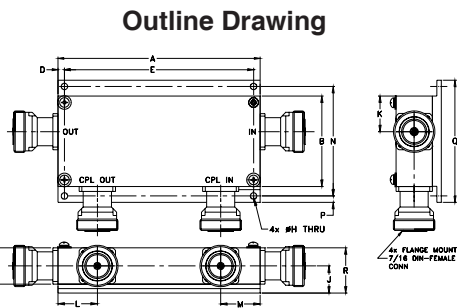
Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	3A

Permanent damage may occur if any of these limits are exceeded

Coaxial Connections

INPUT	IN
OUTPUT	OUT
COUPLED IN	CPL IN
COUPLED OUT	CPL OUT



Outline Dimensions (inch mm)

A	B	C	D	E	H	J	K
5.58	2.50	1.00	.18	5.215	.177	.750	.99
141.73	63.50	25.40	4.57	132.46	4.50	19.05	25.15
L	M	N	P	Q	R		wt
1.09	1.09	3.025	0.18	3.38	1.25		grams
27.69	27.69	76.84	4.57	85.85	31.75		870.0

IP protection classification: IP67

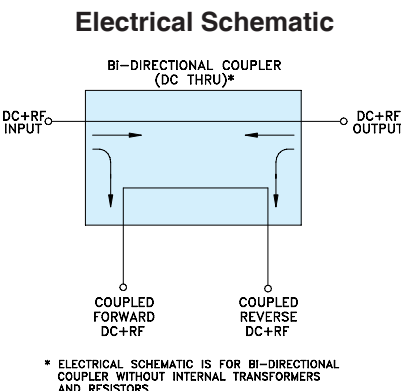
- Features
- wide frequency range, 300-3000 MHz
 - high directivity, 20 dB typ.
 - good VSWR, 1.22:1 typ.
 - high power, up to 250W
 - DC current pass through input to output
 - IP67 weather proof case

- Applications
- cellular
 - lab use
 - WiMAX
 - PCN
 - GSM
 - ISM

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Operating Frequency		300		3000	MHz
Coupling	300-700	—	22.9±2.9	—	dB
	700-2700	—	20.4±0.8	—	
	2700-3000	—	20.3±0.8	—	
Coupling Flatness	300-700	—	—	±3.0	dB
	700-2700	—	—	±0.75	
	2700-3000	—	—	±0.5	
Mainline Loss ¹	300-700	—	0.08	0.2	dB
	700-2700	—	0.15	0.3	
	2700-3000	—	0.2	0.35	
Directivity	300-700	20	28	—	dB
	700-2700	12	20	—	
	2700-3000	10	18	—	
Return Loss	300-700	—	28	—	dB
	700-2700	—	20	—	
	2700-3000	—	18	—	
Input Power ²	300-700	—	—	250	W
	700-2700	—	—	250	
	2700-3000	—	—	160	

1. Does not include coupling loss.
2. At 25°C with no DC current. Derate linearly to 100W (300-2700 MHz) and to 64W (2700-3000 MHz) from 25°C to 100°C. Output load VSWR 2.0:1 max.



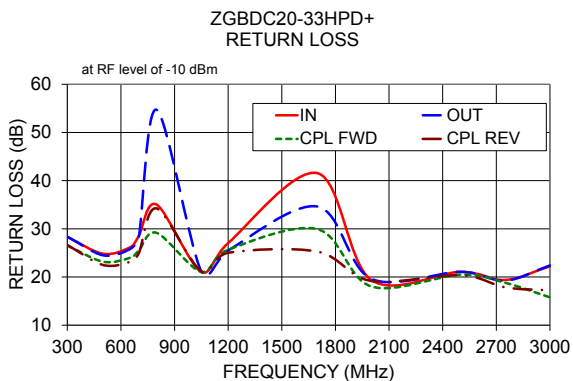
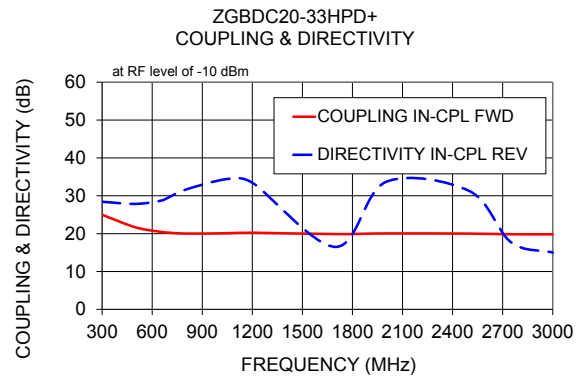
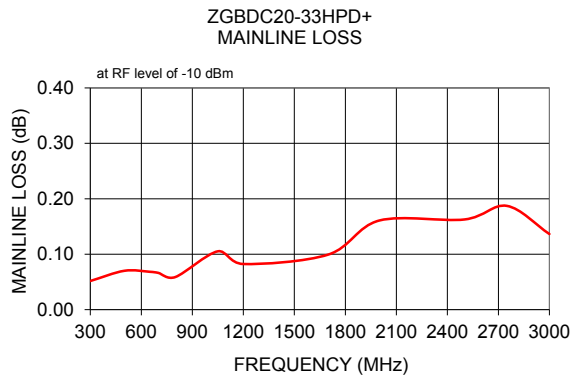
CASE STYLE: HT1412-1
Connectors Model
7/16 DIN ZGBDC20-33HPD+

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

Notes
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Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
300.00	0.05	24.98	24.97	27.86	28.42	28.31	28.38	26.53	26.66
500.00	0.07	21.66	21.66	26.58	27.86	24.83	24.51	23.18	22.50
650.00	0.07	20.49	20.53	26.15	28.68	26.15	25.78	23.98	23.15
700.00	0.07	20.26	20.31	26.21	29.60	28.53	28.31	25.47	24.94
800.00	0.06	20.02	20.05	26.96	31.62	35.02	54.71	29.16	34.24
1050.00	0.11	20.11	20.19	33.72	34.43	21.03	21.15	21.05	21.19
1200.00	0.08	20.24	20.31	32.71	33.45	27.04	25.52	25.66	25.02
2000.00	0.16	20.06	20.19	26.93	33.65	19.40	19.64	18.05	19.18
2500.00	0.16	20.01	20.18	22.19	31.27	21.07	21.07	20.49	20.38
3000.00	0.14	19.81	20.07	17.19	15.00	22.22	22.40	15.78	17.22



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Bi-Directional Coupler

ZGBDC20-33HPD+

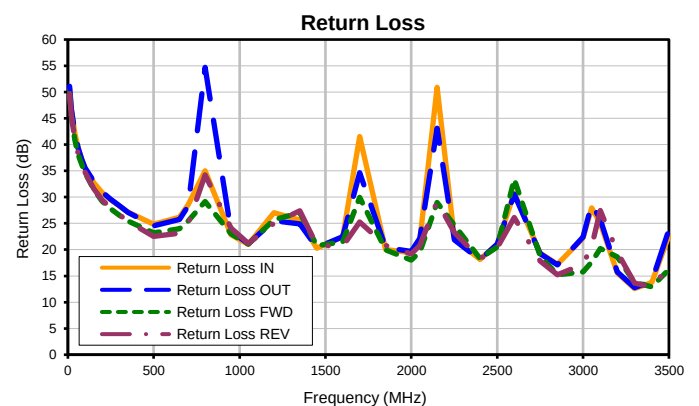
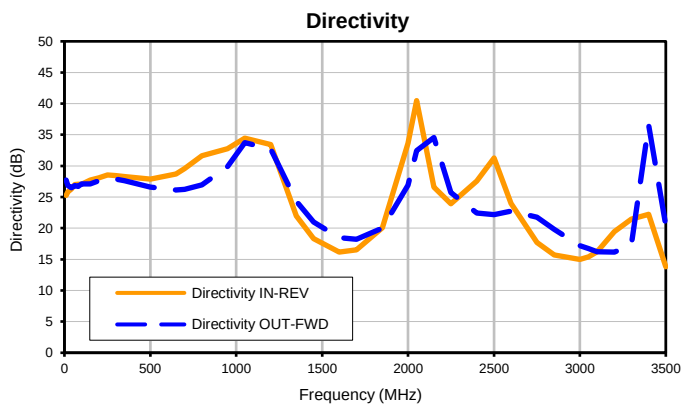
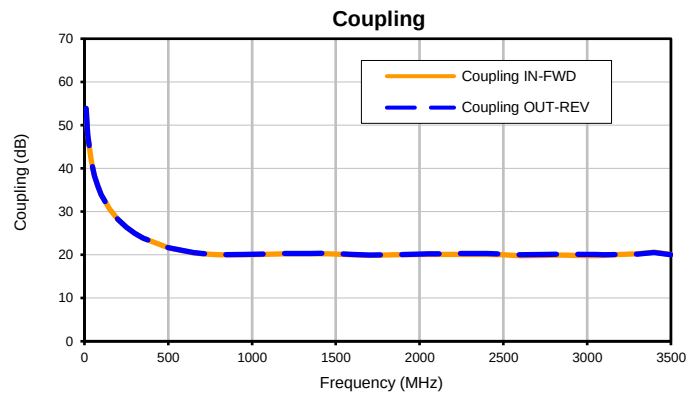
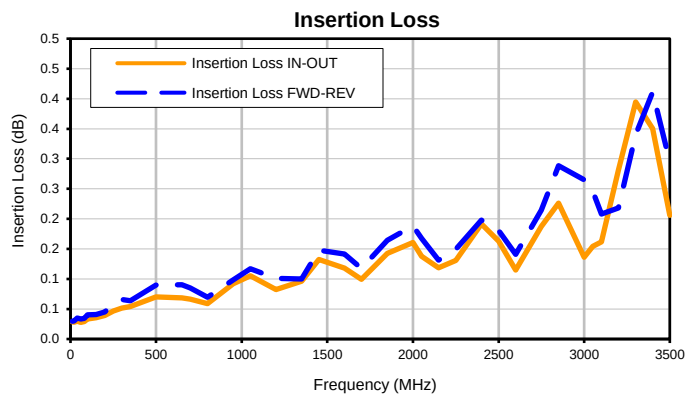
Typical Performance Data

FREQ. (MHz)	INSERTION LOSS		COUPLING		DIRECTIVITY		RETURN LOSS			
	(dB)		(dB)		(dB)		(dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
10	0.03	0.03	53.76	53.88	25.27	27.75	50.59	51.10	49.77	49.64
20	0.03	0.03	47.89	47.83	25.83	26.83	46.67	46.75	45.58	45.44
40	0.03	0.03	41.86	41.80	26.27	26.47	42.15	42.32	40.84	40.99
60	0.03	0.03	38.33	38.30	27.02	26.84	39.39	39.39	38.15	38.30
80	0.03	0.03	35.84	35.83	27.05	26.72	37.32	37.25	36.28	36.35
100	0.03	0.04	33.94	33.91	27.07	27.12	35.46	35.55	34.60	34.69
150	0.04	0.04	30.52	30.49	27.73	27.13	32.77	32.99	31.45	31.60
200	0.04	0.05	28.15	28.12	28.08	27.62	30.90	31.00	29.25	29.47
250	0.05	0.06	26.37	26.36	28.53	27.86	29.46	29.57	27.77	27.97
300	0.05	0.07	24.98	24.97	28.42	27.86	28.31	28.38	26.53	26.66
350	0.05	0.06	23.87	23.85	28.29	27.64	27.15	27.12	25.42	25.36
500	0.07	0.09	21.66	21.66	27.86	26.58	24.83	24.51	23.18	22.50
650	0.07	0.09	20.49	20.53	28.68	26.15	26.15	25.78	23.98	23.15
700	0.07	0.08	20.26	20.31	29.60	26.21	28.53	28.31	25.47	24.94
800	0.06	0.07	20.02	20.05	31.62	26.96	35.02	54.71	29.16	34.24
950	0.09	0.10	20.02	20.06	32.77	29.91	22.83	23.50	23.02	24.13
1050	0.11	0.12	20.11	20.19	34.43	33.72	21.03	21.15	21.05	21.19
1200	0.08	0.10	20.24	20.31	33.45	32.71	27.04	25.52	25.66	25.02
1350	0.10	0.10	20.23	20.35	21.97	24.33	25.64	24.88	27.06	27.39
1450	0.13	0.15	20.24	20.36	18.32	20.97	20.26	20.37	20.76	20.80
1600	0.12	0.14	20.03	20.11	16.16	18.46	22.45	22.49	21.49	20.63
1700	0.10	0.12	19.88	19.94	16.50	18.24	41.55	34.63	29.93	25.26
1850	0.14	0.16	20.00	20.03	20.09	20.04	20.03	20.38	19.97	20.82
2000	0.16	0.19	20.06	20.19	33.65	26.93	19.40	19.64	18.05	19.18
2050	0.14	0.17	20.07	20.21	40.48	32.44	21.83	22.18	19.55	20.83
2150	0.12	0.13	20.09	20.25	26.62	34.56	50.90	43.09	28.97	29.18
2250	0.13	0.15	20.08	20.32	23.91	25.74	22.08	21.83	24.66	23.23
2400	0.19	0.20	20.10	20.33	27.57	22.42	18.11	18.07	18.32	18.28
2500	0.16	0.18	20.01	20.18	31.27	22.19	21.07	21.07	20.49	20.38
2600	0.11	0.14	19.83	20.02	23.95	22.72	30.75	30.55	33.43	26.14
2750	0.19	0.21	19.84	20.05	17.73	21.74	19.38	19.24	18.80	17.86
2850	0.23	0.29	19.93	20.13	15.72	19.83	17.22	17.12	15.20	15.24
3000	0.14	0.27	19.81	20.07	15.00	17.19	22.22	22.40	15.78	17.22
3050	0.15	0.25	19.81	20.06	15.41	16.73	27.94	28.66	17.64	20.66
3100	0.16	0.21	19.84	20.03	16.24	16.23	25.00	25.73	20.20	27.48
3200	0.28	0.22	20.09	20.09	19.46	16.16	15.60	15.75	18.65	19.53
3300	0.39	0.34	20.25	20.18	21.45	17.34	12.59	12.77	13.75	13.60
3400	0.35	0.41	20.60	20.56	22.23	36.56	13.77	14.02	12.92	12.86
3500	0.21	0.29	20.10	20.01	13.81	20.45	22.73	23.83	16.28	16.72

Bi-Directional Coupler

ZGBDC20-33HPD+

Typical Performance Curves



P.O. Box 350166, Brooklyn, New York 11235-0003 • (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com



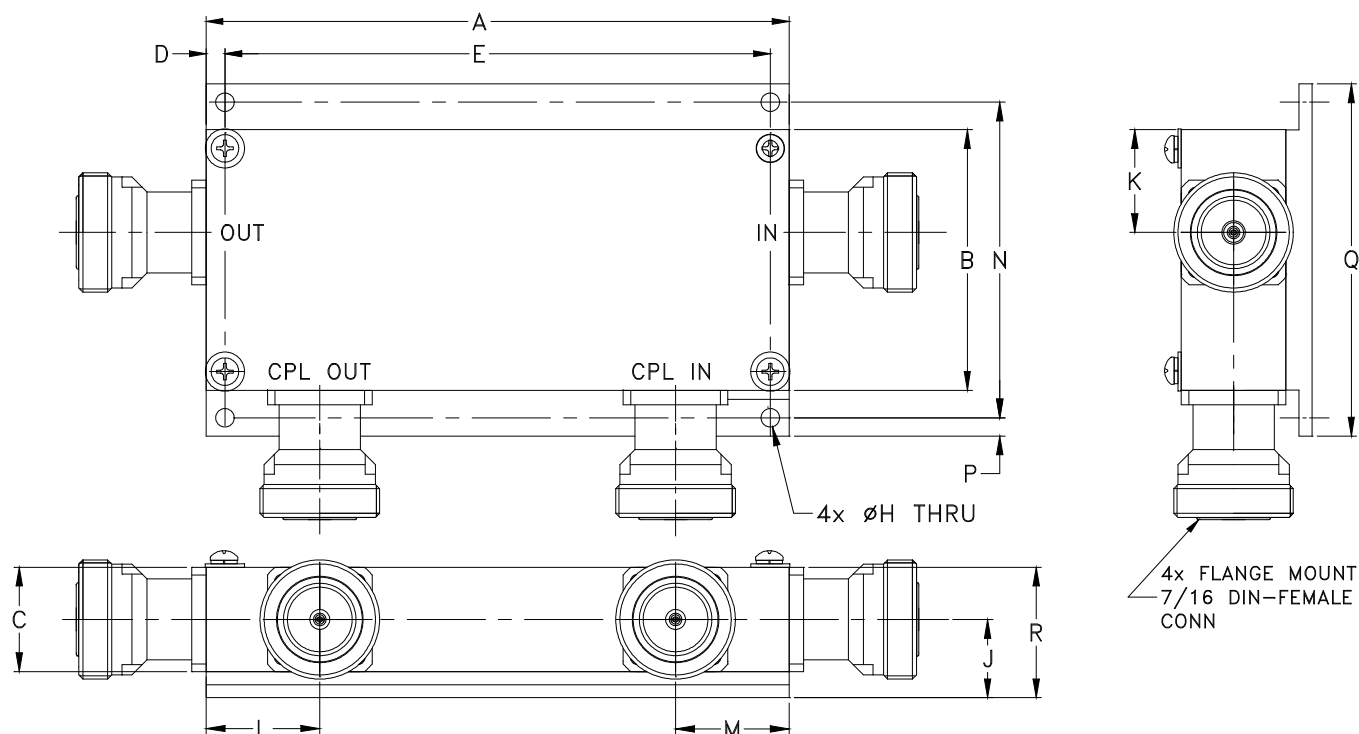
IF/RF MICROWAVE COMPONENTS



REV. OR
ZGBDC20-33HPD+
1/25/2016
Page 1 of 1

Outline Dimensions

HT1412-1



CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N
HT1412-1	5.58 (141.73)	2.50 (63.50)	1.00 (25.40)	.18 (4.57)	5.215 (132.46)	-	-	.177 (4.50)	.750 (19.05)	.99 (25.15)	1.09 (27.69)	1.09 (27.69)	3.025 (76.84)

CASE #	P	Q	R	WT. GRAM
HT1412-1	.18 (4.57)	3.38 (85.85)	1.25 (31.75)	870.0

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

Notes:

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

For RoHS Case Styles: Clear Chemical conversion coating, non-chrome or trivalent chrome based.



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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

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 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Liquid Ingress	Immersion in 1 meter water, 1/2 hour	IP67, IEC60529
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°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