

Bi-Directional Coupler

ZX30-20-20BD-S+

50Ω, 20dB Coupling, 500 to 2000 MHz

Maximum Ratings

Operating Temperature -40°C to 85°C

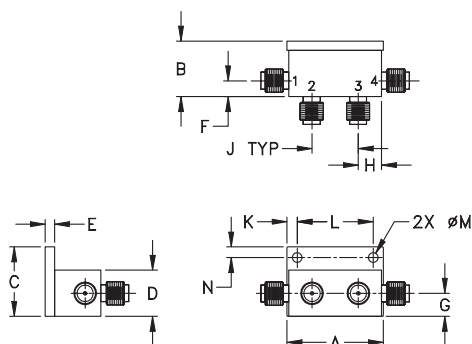
Storage Temperature -55°C to 100°C

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

Coaxial Connections

INPUT	1
OUTPUT	4
COUPLED (forward)	2
COUPLED (reverse)	3

Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
1.04	.60	.75	.50	.10	.17	.25
26.42	15.24	19.05	12.70	2.54	4.32	6.35
H	J	K	L	M	N	wt.
.25	.50	.11	.820	.106	.12	grams
6.35	12.70	2.79	20.83	2.69	3.05	21.0

Features

- very broadband, multi octave
- low mainline loss, 0.2 dB typ.
- power handling, 2 watts
- low cost
- protected by US patent, 6,790,049

Applications

- UHF, GSM, ISM, GPS & PCN
- cellular



Generic photo used for illustration purposes only

CASE STYLE: GW1052

Connectors Model
SMA ZX30-20-20BD-S+

+RoHS Compliant

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

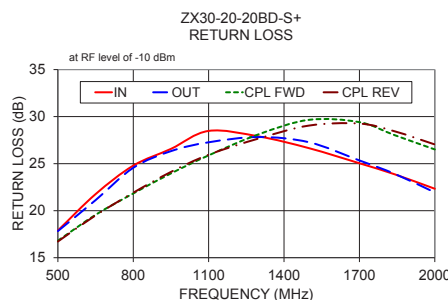
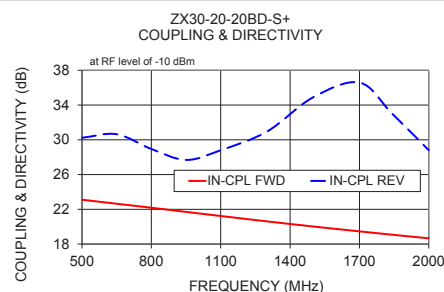
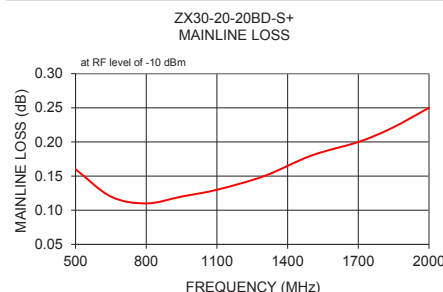
Bi-Directional Coupler Electrical Specifications

FREQ. (MHz)	COUPLING (dB)		MAINLINE LOSS ¹ (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER INPUT (W)
	Nom.	Typ. Flatness	Typ.	Max.	Typ.	Min.		
500-800	22.5±1.0	±0.5	0.2	0.4	21	16	1.2	2
800-1000	21.5±1.0	±0.4	0.15	0.35	21	16	1.2	2
1000-1500	20.5±1.0	±0.8	0.2	0.4	20	16	1.2	2
1700-2000	19.0±1.0	±0.4	0.25	0.5	20	14	1.2	2

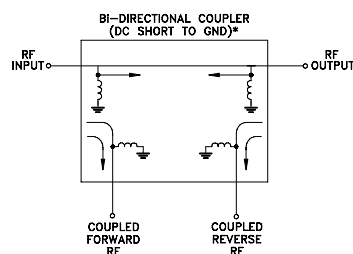
1. Mainline loss includes theoretical power loss at coupled port.

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
		In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
500.00	0.16	23.10	23.06	20.43	30.23	17.89	17.83	16.81	16.72
650.00	0.12	22.64	22.58	20.14	30.64	21.76	21.12	19.56	19.50
800.00	0.11	22.18	22.12	19.89	28.94	24.79	24.56	21.83	21.91
950.00	0.12	21.70	21.60	19.86	27.68	26.57	26.33	23.96	24.12
1100.00	0.13	21.23	21.15	20.23	28.80	28.48	27.27	25.88	25.95
1300.00	0.15	20.61	20.50	20.96	30.94	27.89	27.83	28.13	27.68
1500.00	0.18	20.02	19.92	21.68	34.89	26.64	27.27	29.66	29.05
1700.00	0.20	19.46	19.36	22.08	36.59	25.04	25.34	29.41	29.26
1840.00	0.22	19.08	18.98	21.62	33.05	23.87	23.92	28.03	28.44
2000.00	0.25	18.66	18.54	20.89	28.80	22.33	21.94	26.51	27.04



Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

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/MCStore/terms.jsp



Bi-Directional Coupler

ZX30-20-20BD+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS	COUPLING		DIRECTIVITY		RETURN LOSS			
	(dB) IN-OUT	(dB) IN-FWD	(dB) OUT-REV	(dB) IN-REV	(dB) OUT-FWD	(dB) IN	(dB) OUT	(dB) FWD	(dB) REV
10.0	17.72	43.84	39.87	14.01	16.71	0.16	0.45	0.15	0.15
20.0	12.02	37.91	34.06	14.62	16.59	0.40	0.58	0.37	0.36
30.0	8.85	34.57	30.94	14.87	17.10	0.76	0.82	0.69	0.68
40.0	6.80	32.29	29.01	15.19	17.47	1.20	1.18	1.08	1.08
50.0	5.39	30.63	27.72	15.65	17.85	1.71	1.66	1.54	1.53
60.0	4.39	29.38	26.85	16.21	18.25	2.23	2.23	2.03	2.03
70.0	3.65	28.42	26.22	16.77	18.59	2.75	2.85	2.54	2.54
80.0	3.08	27.66	25.73	17.29	18.82	3.29	3.50	3.07	3.07
90.0	2.62	27.04	25.35	17.72	19.07	3.83	4.13	3.61	3.59
100.0	2.23	26.55	25.05	18.06	19.27	4.39	4.70	4.13	4.11
150.0	1.14	25.09	24.27	19.93	20.05	7.09	6.91	6.58	6.54
200.0	0.74	24.43	24.00	23.36	20.37	9.06	9.29	8.67	8.61
250.0	0.47	24.05	23.77	23.76	20.61	11.25	11.07	10.47	10.39
300.0	0.37	23.79	23.65	27.78	20.80	12.55	12.55	12.02	11.91
350.0	0.26	23.59	23.44	27.93	20.72	14.49	14.41	13.41	13.31
400.0	0.23	23.42	23.34	30.00	20.68	15.38	15.25	14.65	14.51
450.0	0.17	23.25	23.16	31.64	20.53	17.19	17.13	15.77	15.63
500.0	0.16	23.10	23.06	30.23	20.43	17.89	17.83	16.81	16.72
550.0	0.14	22.95	22.90	32.40	20.31	19.55	19.23	17.75	17.66
600.0	0.13	22.80	22.74	29.69	20.27	20.30	20.41	18.70	18.60
650.0	0.12	22.64	22.58	30.64	20.14	21.76	21.12	19.56	19.50
700.0	0.12	22.49	22.40	29.38	19.99	22.61	22.73	20.34	20.36
750.0	0.11	22.33	22.27	28.68	19.98	23.63	22.88	21.14	21.19
800.0	0.11	22.18	22.12	28.94	19.89	24.79	24.56	21.83	21.91
850.0	0.11	22.02	21.97	27.77	19.94	25.31	24.67	22.62	22.81
890.0	0.11	21.89	21.82	28.49	19.90	26.55	25.53	23.17	23.45
900.0	0.12	21.86	21.79	28.53	19.90	26.56	25.95	23.29	23.59
950.0	0.12	21.70	21.60	27.68	19.86	26.57	26.33	23.96	24.12
1000.0	0.12	21.54	21.45	28.44	19.96	27.83	26.74	24.62	24.84
1050.0	0.13	21.39	21.29	28.00	20.03	27.41	27.72	25.14	25.52
1100.0	0.13	21.23	21.15	28.80	20.23	28.48	27.27	25.88	25.95
1150.0	0.14	21.08	21.00	29.13	20.35	27.71	28.36	26.56	26.49
1200.0	0.14	20.92	20.83	29.49	20.54	28.36	27.58	27.07	26.93
1250.0	0.15	20.77	20.67	30.54	20.78	27.82	28.38	27.69	27.30
1300.0	0.15	20.61	20.50	30.94	20.96	27.89	27.83	28.13	27.68
1350.0	0.16	20.47	20.36	32.37	21.13	27.57	27.77	28.72	28.12
1400.0	0.16	20.32	20.21	32.47	21.38	27.24	27.78	29.22	28.54
1450.0	0.17	20.17	20.08	34.51	21.59	27.18	27.13	29.39	28.86
1500.0	0.18	20.02	19.92	34.89	21.68	26.64	27.27	29.66	29.05
1550.0	0.18	19.88	19.77	37.48	21.89	26.59	26.38	29.89	29.38
1600.0	0.19	19.74	19.63	36.36	21.91	25.89	26.39	29.72	29.44
1650.0	0.19	19.60	19.49	38.50	21.99	25.83	25.65	29.47	29.39
1700.0	0.20	19.46	19.36	36.59	22.08	25.04	25.34	29.41	29.26
1760.0	0.21	19.30	19.19	35.74	21.76	24.78	24.59	28.72	28.86
1780.0	0.21	19.24	19.14	35.22	21.75	24.62	24.26	28.48	28.63
1800.0	0.22	19.19	19.09	34.26	21.73	24.37	24.12	28.28	28.48
1840.0	0.22	19.08	18.98	33.05	21.62	23.87	23.92	28.03	28.44
1880.0	0.23	18.97	18.87	32.41	21.42	23.59	23.26	27.59	28.20
1900.0	0.23	18.92	18.82	31.64	21.33	23.39	22.97	27.38	27.97
1950.0	0.24	18.79	18.68	29.87	21.13	22.79	22.69	26.87	27.34
2000.0	0.25	18.66	18.54	28.80	20.89	22.33	21.94	26.51	27.04
2500.0	0.38	17.44	17.31	19.26	16.37	16.52	16.43	21.53	21.64
3000.0	0.62	16.16	15.98	14.30	12.60	12.70	12.72	16.84	16.78
3500.0	0.90	14.55	14.35	11.23	9.73	10.48	10.52	12.81	12.81
4000.0	1.26	12.05	11.87	8.81	7.02	9.88	9.89	9.09	8.75



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

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REV. X1

ZX30-20-20BD+

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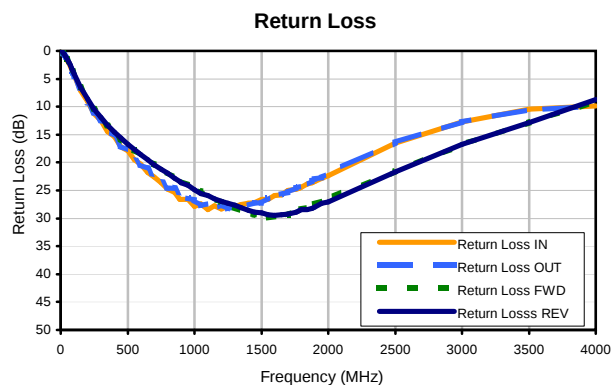
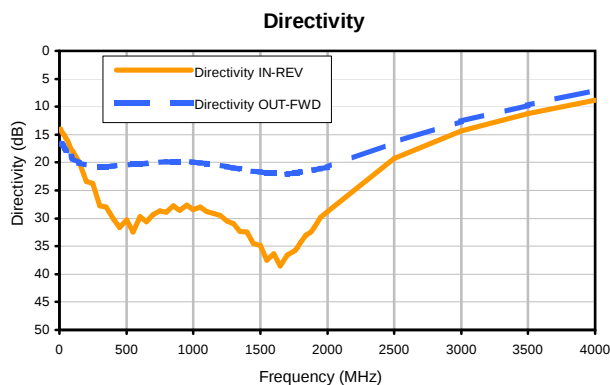
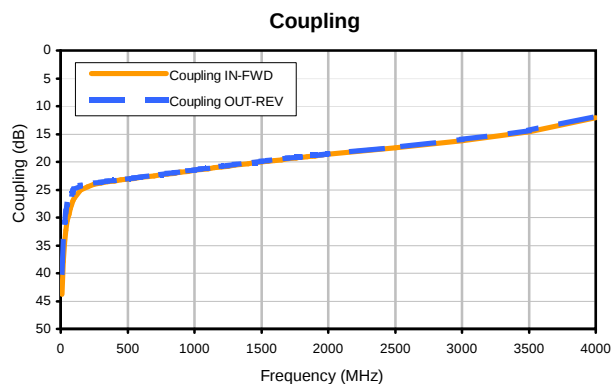
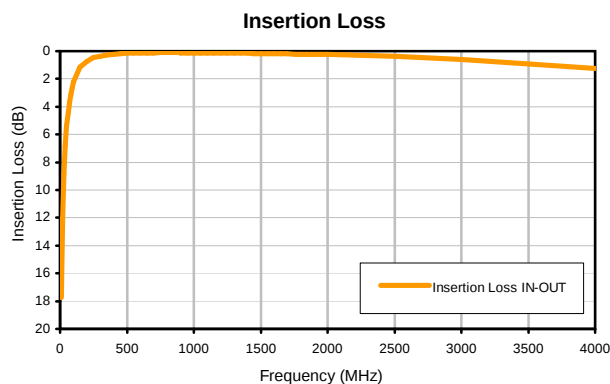
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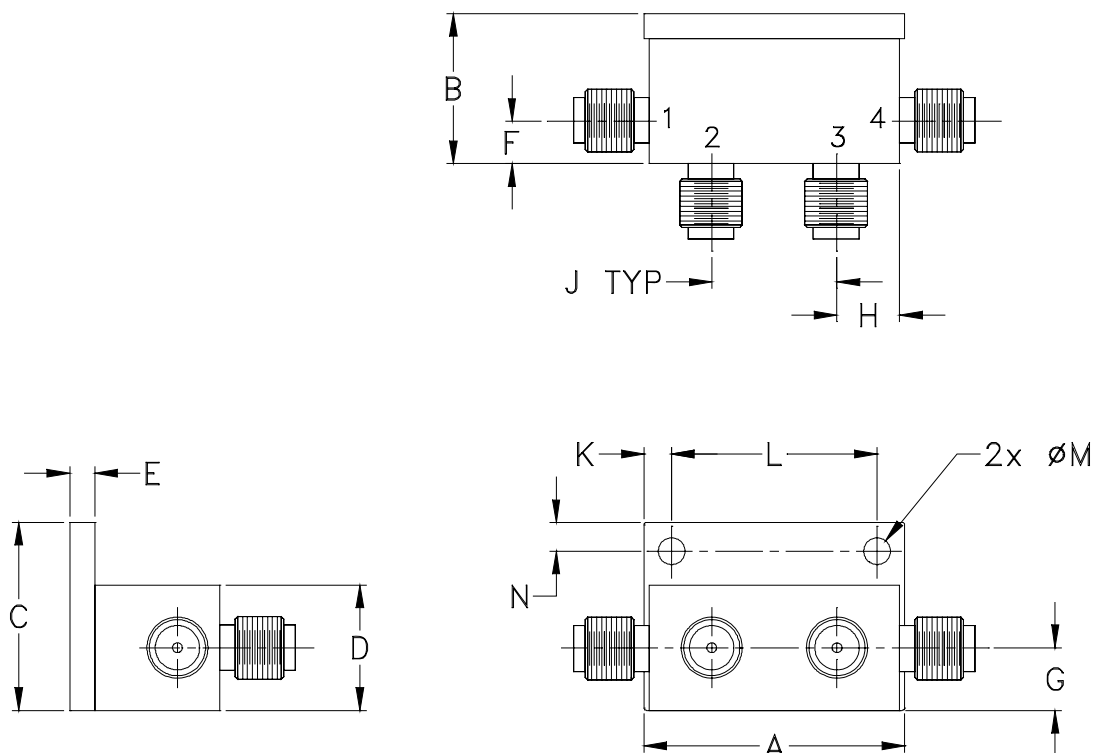
Bi-Directional Coupler

Typical Performance Curves

ZX30-20-20BD+



Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT. GRAM
GW1052	1.04 (26.42)	.60 (15.24)	.75 (19.05)	.50 (12.70)	.10 (2.54)	.17 (4.32)	.25 (6.35)	.25 (6.35)	.50 (12.70)	.11 (2.79)	.820 (20.83)	.106 (2.69)	.12 (3.05)	21.0

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

Tolerance on hole size and interaxes dimensions to be $\pm .005$.

Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.



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	-40° to 85°C	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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