



COAXIAL

# Bi-Directional Coupler ZFBDC20-13HP+

Mini-Circuits

50Ω Up to 20W 40 to 1000 MHz

## FEATURES

- Excellent mainline loss, 0.4 dB typ.
- Excellent directivity, 23 dB typ.
- High power, up to 20W
- Rugged shielded case

## APPLICATIONS

- Power leveling & monitoring
- GPS
- Cellular/PCS



Generic photo used for illustration purposes only

Case Style: JD1252

Connectors	Model
BNC	ZFBDC-13HP+
SMA	ZFBDC-13HP-S+

### +RoHS Compliant

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

## ELECTRICAL SPECIFICATIONS

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		40		1000	MHz
Mainline Loss <sup>1</sup>	40-1000		0.6	1.1	dB
	800-1000		0.6	1.1	
	40-500		0.3	0.7	
Coupling Nominal	40-1000		20±0.5		dB
	800-1000		20.5±0.7		
	40-500		19.5±0.5		
Coupling Flatness (±)	40-1000		±1.2		dB
	800-1000		±0.5		
	40-500		±0.5		
Directivity	40-1000	15	22		dB
	800-1000	15	23		
	40-500	15	25		
VSWR	40-1000		1.20		:1
	800-1000		1.30		
	40-500		1.10		
Input Power <sup>2</sup>	40-1000			10	W
	800-1000			10	
	40-500			20	

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

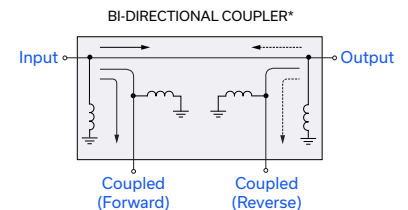
2. Power rating is specified up to +55°C. Power Input Specifications at +100°C is 50% value at +55°C. For specifications limits between +55°C and +100°C, derate linearly.

## MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C

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

## ELECTRICAL SCHEMATIC



\*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground

Mini-Circuits



COAXIAL

# Bi-Directional Coupler ZFBDC20-13HP+

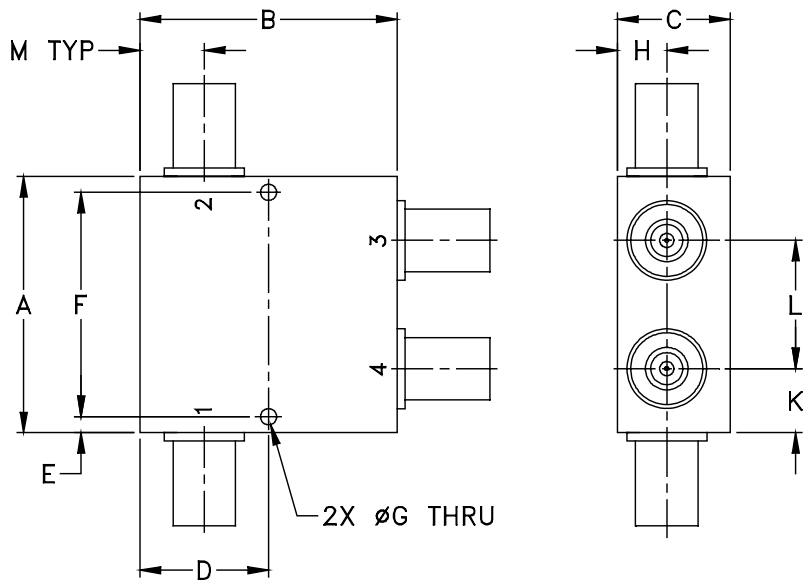
Mini-Circuits

50Ω Up to 20W 40 to 1000 MHz

## COAXIAL CONNECTIONS

Input	1
Output	2
Coupled (Forward)	4
Coupled (Reverse)	3

## OUTLINE DRAWING



## OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	
2.00	2.00	.88	1.000	0.13	1.750	0.125	
50.80	50.80	22.35	25.40	3.30	44.45	3.18	
H	J	K	L	M		wt	
0.38	--	0.50	1.00	0.50		grams	
9.65	--	12.70	25.40	12.70		250.0	





COAXIAL

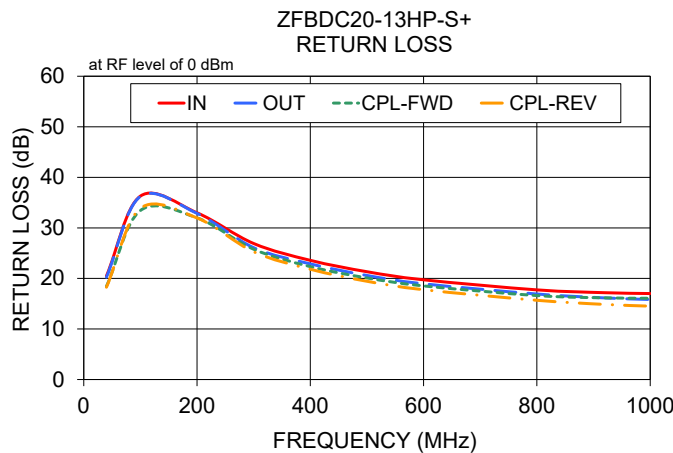
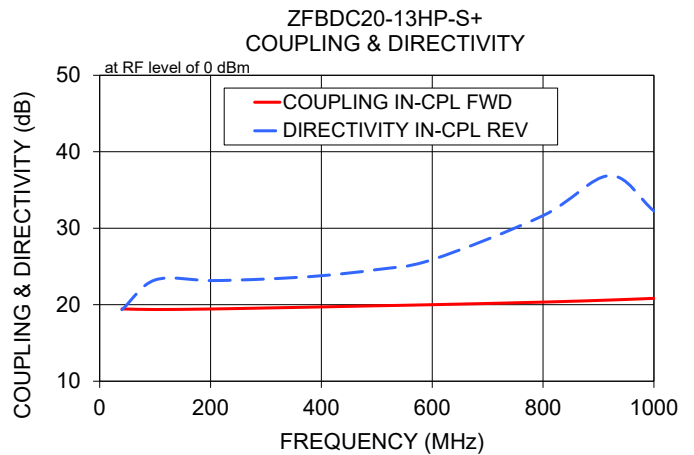
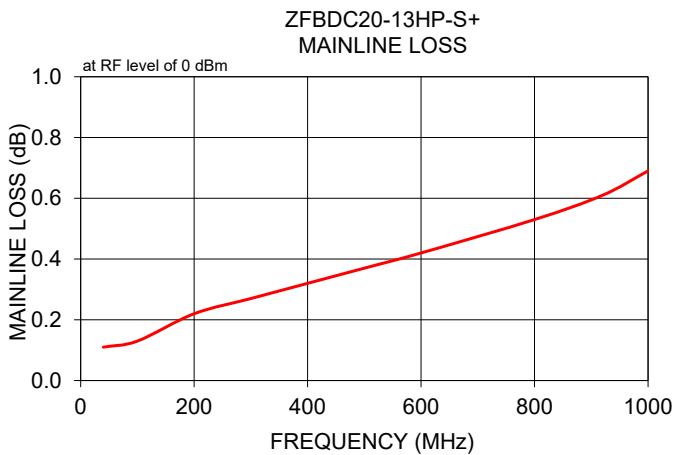
# Bi-Directional Coupler ZFBDC20-13HP+

Mini-Circuits

50Ω Up to 20W 40 to 1000 MHz

## TYPICAL PERFORMANCE DATA AND CHARTS

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
40.00	0.11	19.45	19.63	18.97	19.34	20.48	20.24	18.42	18.26
100.00	0.13	19.37	19.43	25.87	23.24	36.29	36.23	33.44	33.87
200.00	0.22	19.44	19.61	30.40	23.15	32.98	32.87	31.98	31.96
300.00	0.27	19.57	19.77	33.08	23.36	26.91	26.08	25.78	25.27
400.00	0.32	19.71	19.96	37.14	23.79	23.58	22.88	22.34	21.82
500.00	0.37	19.86	20.14	46.58	24.59	21.33	20.59	20.10	19.44
600.00	0.42	20.00	20.32	38.80	25.89	19.73	18.94	18.52	17.77
800.00	0.53	20.34	20.68	26.00	31.65	17.74	16.92	16.61	15.68
920.00	0.61	20.61	20.89	21.83	36.88	17.18	16.15	16.16	14.86
1000.00	0.69	20.83	21.08	19.32	32.27	17.01	15.83	16.08	14.52



- 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-Circuits' 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# Bi-Directional Coupler

# ZFBDC20-13HP+

## 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
40.0	0.11	0.14	19.45	19.63	19.34	18.97	20.48	20.24	18.42	18.26
50.0	0.10	0.11	19.46	19.56	20.71	20.62	22.95	22.68	20.85	20.68
90.0	0.11	0.12	19.38	19.43	23.15	25.01	33.24	32.82	30.73	30.69
100.0	0.13	0.14	19.37	19.43	23.24	25.87	36.29	36.23	33.44	33.87
200.0	0.22	0.25	19.44	19.61	23.15	30.40	32.98	32.87	31.98	31.96
300.0	0.27	0.30	19.57	19.77	23.36	33.08	26.91	26.08	25.78	25.27
400.0	0.32	0.34	19.71	19.96	23.79	37.14	23.58	22.88	22.34	21.82
500.0	0.37	0.38	19.86	20.14	24.59	46.58	21.33	20.59	20.10	19.44
540.0	0.41	0.40	19.93	20.23	25.06	43.21	20.60	19.98	19.34	18.73
560.0	0.42	0.40	19.97	20.27	25.36	41.11	20.27	19.64	18.99	18.36
600.0	0.42	0.41	20.00	20.32	25.89	38.80	19.73	18.94	18.52	17.77
640.0	0.47	0.46	20.08	20.43	26.65	35.10	19.21	18.46	17.92	17.20
680.0	0.48	0.43	20.14	20.48	27.60	31.37	18.73	18.04	17.50	16.76
720.0	0.49	0.48	20.20	20.55	28.51	30.38	18.38	17.53	17.19	16.33
760.0	0.55	0.50	20.30	20.67	30.04	27.89	18.03	17.19	16.86	15.91
800.0	0.53	0.49	20.34	20.68	31.65	26.00	17.74	16.92	16.61	15.68
840.0	0.58	0.54	20.45	20.80	33.69	24.89	17.53	16.57	16.46	15.31
880.0	0.60	0.60	20.52	20.89	36.17	23.14	17.31	16.35	16.21	15.10
920.0	0.61	0.56	20.61	20.89	36.88	21.83	17.18	16.15	16.16	14.86
960.0	0.66	0.68	20.72	21.04	35.13	20.72	17.09	15.98	16.13	14.66
1000.0	0.69	0.68	20.83	21.08	32.27	19.32	17.01	15.83	16.08	14.52



P.O. Box 350188, Brooklyn, New York 11235-0000 (718) 934-4500 Fax (718) 332-4951 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MIN-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/MICROWAVE COMPONENTS

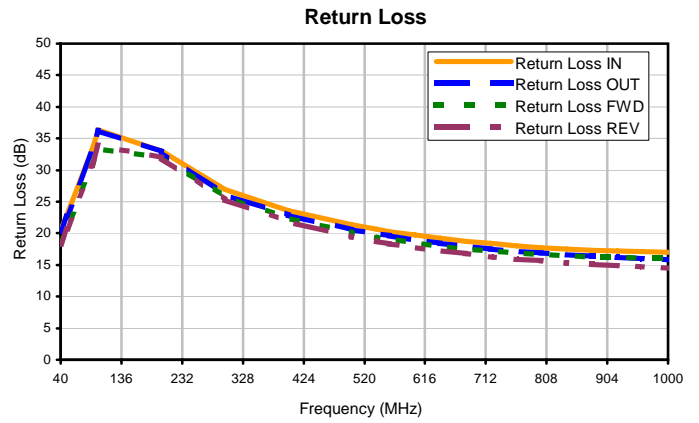
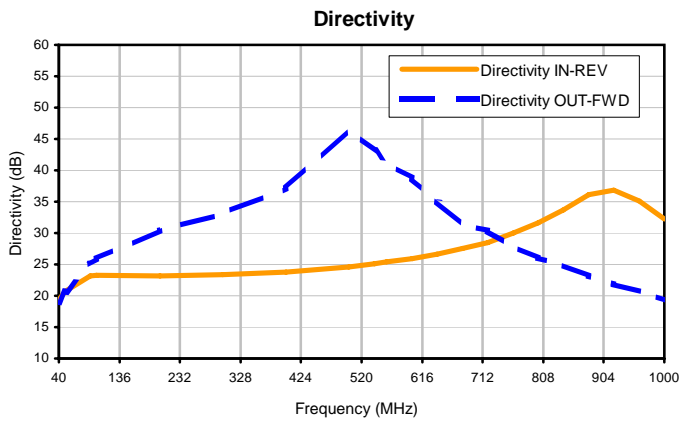
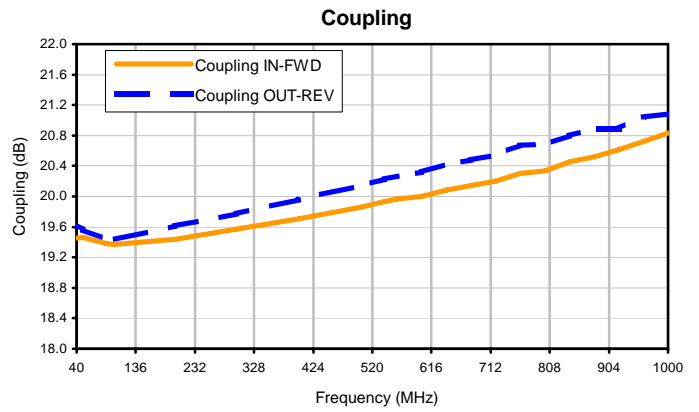
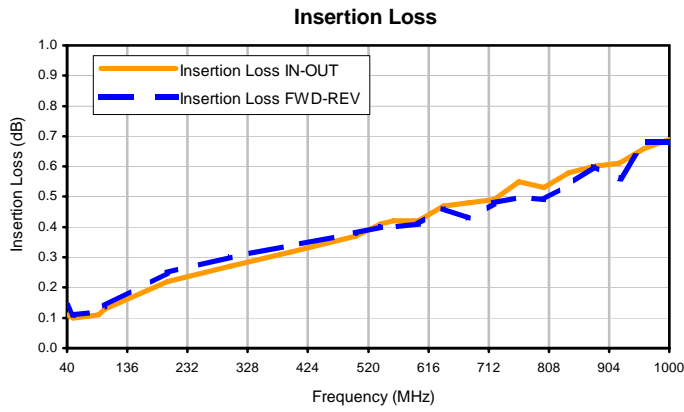


REV. X1  
ZFBDC20-13HP+  
12/31/2008  
Page 1 of 1

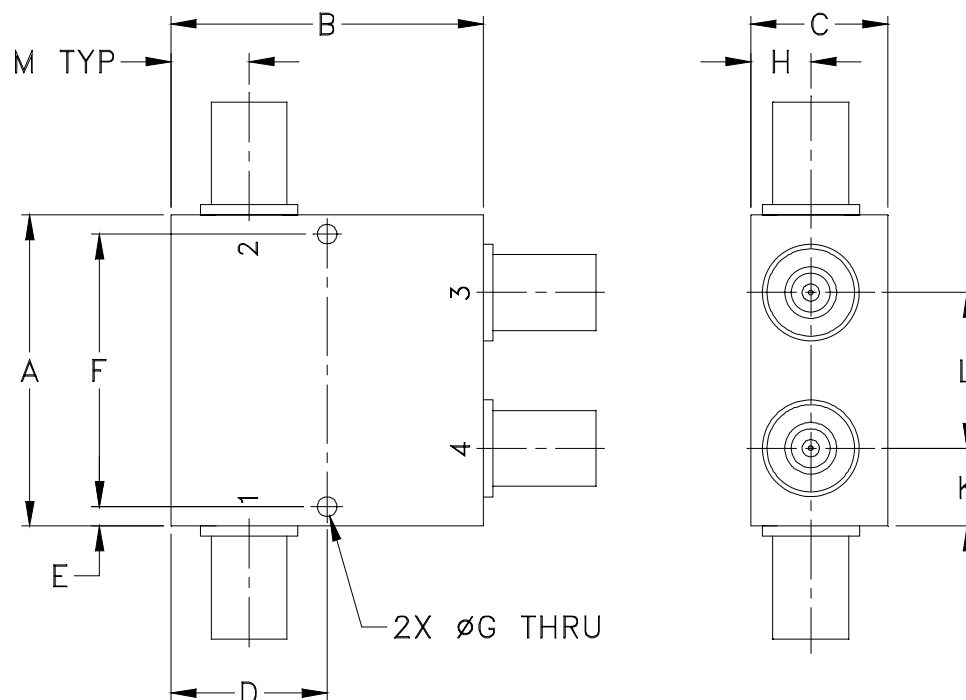
# Bi-Directional Coupler

## Typical Performance Curves

# ZFBDC20-13HP+



### Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
JD1252	2.00 (50.80)	2.00 (50.80)	0.88 (22.35)	1.000 (25.40)	0.13 (3.18)	1.750 (44.45)	0.125 (3.18)	0.38 (9.65)	-- --	0.50 (12.70)	1.00 (25.40)	0.50 (12.70)	250.00

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

#### Notes:

- Case material: Aluminum alloy.
- Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.



INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified



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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 100°C Ambient Environment	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