

DC to 10 MHz Pass

Bi-Directional Coupler

ZABDC20-232H+

50Ω Up to 50W 800 to 2300 MHz

The Big Deal

- Excellent mainline loss, 0.25 dB typ.
- Excellent directivity, 23 dB typ.
- DC pass through, 2.0 A max @ 50 W RF power
- 10 MHz pass through



CASE STYLE: DD477-1

Product Overview

Mini-Circuits ZABDC20-232H+ is a 20-dB bi-directional coupler ideal for power leveling and monitoring L-band applications. The rugged aluminum alloy case measures 2.0" x 2.0" x 0.88" high, with gold-plated SMA or N-type connectors.

Key Features

Feature	Advantages
Mainline loss 0.25 dB typ.	Extremely low mainline loss for applications where signal strength is key, such as GPS, CDMA, UMTS, and LTE base station transmitters
Directivity 23 dB typ.	Enables more accurate sampling for VSWR measurements
DC pass through 2.0 A max.	Allows flexible deployment between active components and their DC power supplies
10 MHz pass through	Pass through at 10 MHz supports reference clock frequency communication to remote systems
Full L band coverage	Extended frequency range makes this coupler ideal for use in satcom systems, such as LNB/BUC installations

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



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Maximum Ratings

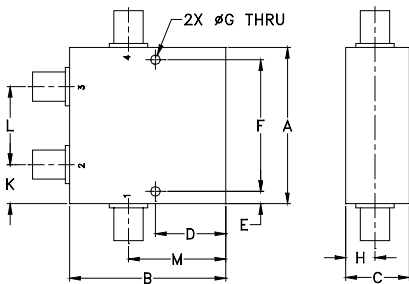
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	2.0 A

* Case temperature is defined as temperature on ground leads. 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
2.00	2.00	.88	.90	.156	1.688	.125
50.80	50.80	22.35	22.86	3.96	42.88	3.18
H	J	K	L	M	wt	
.38	---	.50	1.00	1.25	grams	
9.65	---	12.70	25.40	31.75	225	

Features

- excellent mainline loss, 0.25 dB typ.
- excellent directivity, 23 dB typ.
- high power, up to 50W
- rugged shielded case
- DC current through input to output 2.0A Max. at 50 watt RF input power
- 10 MHz pass through

Applications

- L Band
- PCS/DCS/UMTS
- power leveling & monitoring
- VSWR measurement
- satellite communication



Generic photo used for illustration purposes only

CASE STYLE: DD477-1

Connectors	Model
SMA	ZABDC20-232H+
N-Type	ZABDC20-232H-N+

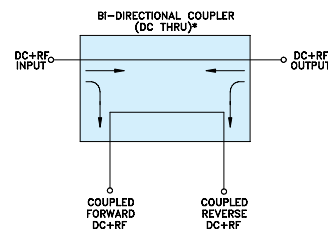
+RoHS Compliant

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

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		800		2300	MHz
Mainline Loss (above theoretical 0.05 dB)	800-2300	—	0.23	0.35	dB
	950-1250	—	0.17	0.30	
	1700-2050	—	0.21	0.35	
	950-2150	—	0.22	0.35	
Coupling	800-2300	—	20.5±1.5	—	dB
	950-1250	—	20.5±1.0	—	
	1700-2050	—	19.5±0.8	—	
	950-2150	—	20.5±1.2	—	
Coupling Flatness (±)	800-2300	—	1.5	1.9	dB
	950-1250	—	0.7	0.9	
	1700-2050	—	0.5	0.7	
	950-2150	—	1.0	1.3	
Directivity	800-2300	17	20	—	dB
	950-1250	18	20	—	
	1700-2050	19	23	—	
	950-2150	18	20	—	
Return Loss (Input)	800-2300	18	23	—	dB
	950-1250	18	23	—	
	1700-2050	20	24	—	
	950-2150	18	23	—	
Return Loss (Output)	800-2300	18	23	—	dB
	950-1250	18	23	—	
	1700-2050	20	25	—	
	950-2150	18	23	—	
Return Loss (Coupling)	800-2300	16	19	—	dB
	950-1250	17	19	—	
	1700-2050	16	20	—	
Return Loss (Coupling)	1700-2050	16	20	—	dB
	950-2150	16	19	—	
Input Power	800-2300	—	—	50	W

Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

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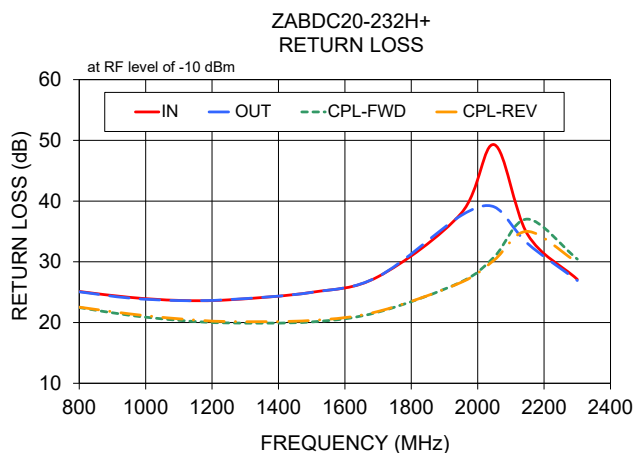
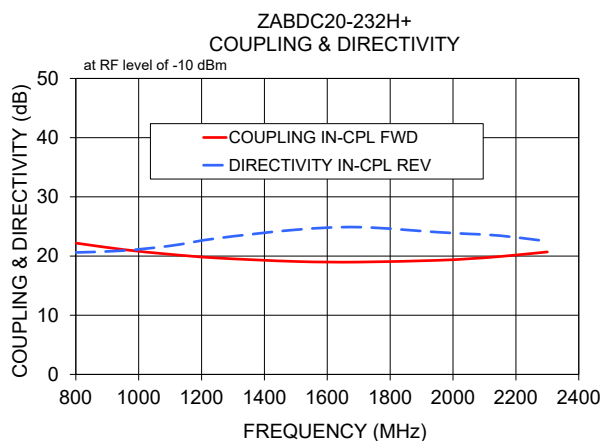
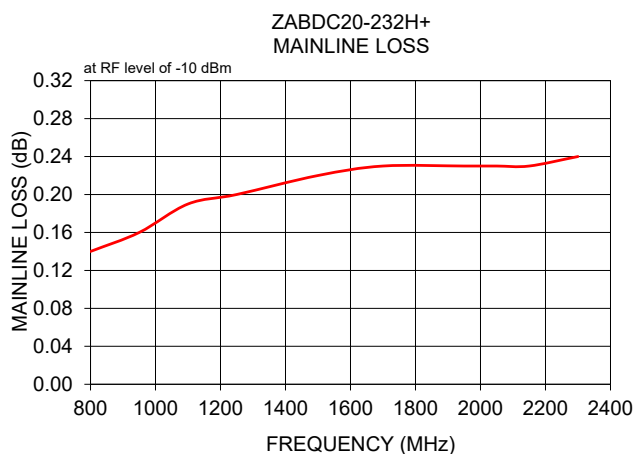


www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

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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
800.00	0.14	22.19	22.18	20.87	20.60	25.12	25.06	22.48	22.54
950.00	0.16	21.10	21.09	21.04	20.91	24.16	24.04	21.21	21.44
1100.00	0.19	20.29	20.27	21.70	21.72	23.65	23.62	20.37	20.62
1250.00	0.20	19.67	19.66	22.84	23.00	23.74	23.78	19.94	20.17
1500.00	0.22	19.08	19.09	24.24	24.44	24.98	24.97	20.11	20.35
1700.00	0.23	18.98	18.97	24.82	24.88	27.55	27.56	21.72	21.83
1950.00	0.23	19.27	19.27	24.65	24.03	37.97	37.62	26.69	26.61
2050.00	0.23	19.54	19.53	24.19	23.74	49.29	39.04	30.82	30.31
2150.00	0.23	19.92	19.90	24.15	23.44	34.53	33.03	37.03	35.01
2300.00	0.24	20.69	20.68	23.47	22.50	27.11	26.92	30.45	29.88



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Bi-Directional Coupler

ZABDC20-232H-N+

Typical Performance Data

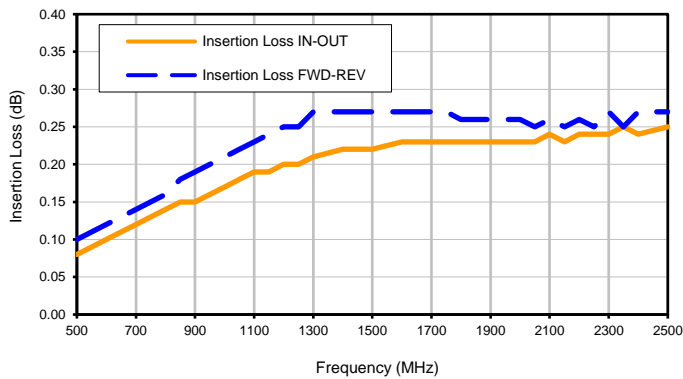
FREQ. (MHz)	INSERTION LOSS		COUPLING		DIRECTIVITY		RETURN LOSS			
	(dB)		(dB)		(dB)		(dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.08	0.10	25.67	25.67	20.40	20.44	28.67	28.65	26.55	26.68
600	0.10	0.12	24.25	24.25	20.37	20.67	27.17	27.23	25.03	25.01
700	0.12	0.14	23.12	23.11	20.54	20.80	26.00	26.06	23.64	23.64
800	0.14	0.16	22.19	22.18	20.60	20.87	25.12	25.06	22.48	22.54
850	0.15	0.18	21.79	21.79	20.66	20.85	24.65	24.57	22.05	22.31
900	0.15	0.19	21.42	21.41	20.80	20.89	24.37	24.33	21.57	21.72
950	0.16	0.20	21.10	21.09	20.91	21.04	24.16	24.04	21.21	21.44
1000	0.17	0.21	20.80	20.78	21.18	21.16	23.93	23.81	20.91	21.10
1050	0.18	0.22	20.53	20.52	21.42	21.45	23.80	23.75	20.60	20.84
1100	0.19	0.23	20.29	20.27	21.72	21.70	23.65	23.62	20.37	20.62
1150	0.19	0.24	20.07	20.05	22.07	22.03	23.64	23.68	20.10	20.31
1200	0.20	0.25	19.87	19.85	22.52	22.49	23.63	23.67	20.00	20.26
1250	0.20	0.25	19.67	19.66	23.00	22.84	23.74	23.78	19.94	20.17
1300	0.21	0.27	19.51	19.50	23.27	23.17	23.83	23.97	19.83	20.05
1400	0.22	0.27	19.25	19.26	23.79	23.63	24.24	24.28	19.87	20.07
1500	0.22	0.27	19.08	19.09	24.44	24.24	24.98	24.97	20.11	20.35
1600	0.23	0.27	18.99	18.99	24.91	24.77	26.03	26.00	20.76	20.97
1650	0.23	0.27	18.98	18.98	24.92	24.64	26.69	26.61	21.13	21.25
1700	0.23	0.27	18.98	18.97	24.88	24.82	27.55	27.56	21.72	21.83
1750	0.23	0.27	19.00	19.00	24.64	24.87	28.53	28.64	22.22	22.35
1800	0.23	0.26	19.03	19.03	24.66	24.82	30.08	30.29	23.12	23.07
1850	0.23	0.26	19.10	19.09	24.38	25.03	31.76	32.19	23.95	24.04
1900	0.23	0.26	19.17	19.17	24.21	24.50	34.27	34.38	25.04	24.73
1950	0.23	0.26	19.27	19.27	24.03	24.65	37.97	37.62	26.69	26.61
2000	0.23	0.26	19.40	19.39	23.89	24.43	44.82	39.93	28.25	27.63
2050	0.23	0.25	19.54	19.53	23.74	24.19	49.29	39.04	30.82	30.31
2100	0.24	0.26	19.72	19.72	23.63	24.31	39.40	35.77	33.91	32.55
2150	0.23	0.25	19.92	19.90	23.44	24.15	34.53	33.03	37.03	35.01
2200	0.24	0.26	20.15	20.14	23.33	24.02	31.54	30.56	37.29	35.35
2250	0.24	0.25	20.40	20.38	22.88	23.93	28.88	28.50	33.92	32.86
2300	0.24	0.27	20.69	20.68	22.50	23.47	27.11	26.92	30.45	29.88
2350	0.25	0.25	21.01	20.99	21.97	23.17	25.52	25.36	27.79	27.23
2400	0.24	0.27	21.36	21.33	21.39	22.46	24.26	24.13	25.99	25.78
2500	0.25	0.27	22.16	22.13	19.81	20.89	22.21	22.02	22.86	22.65

Bi-Directional Coupler

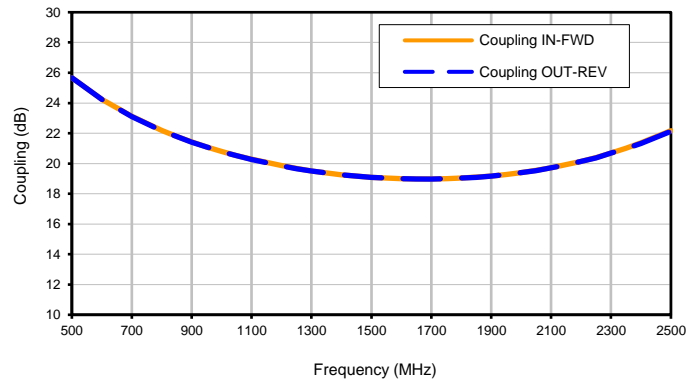
Typical Performance Curves

ZABDC20-232H-S+

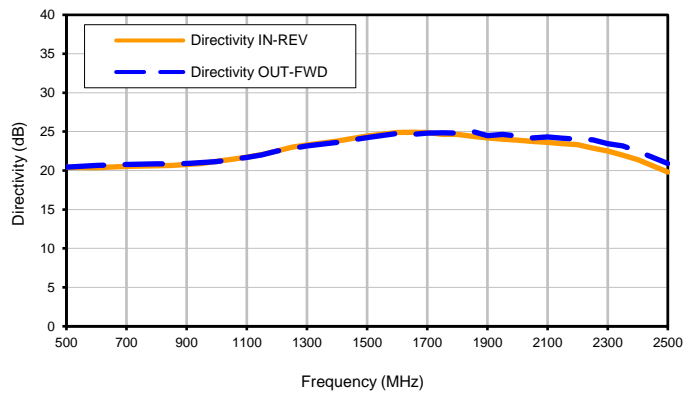
Insertion Loss



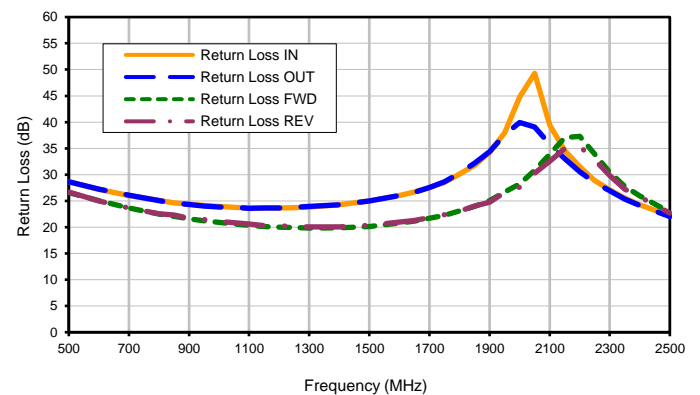
Coupling



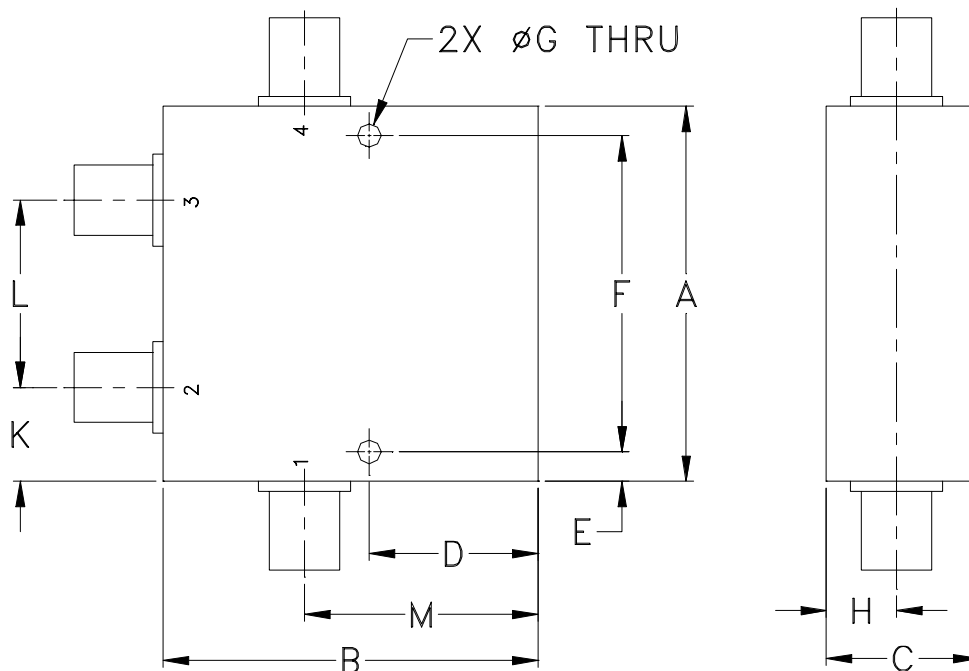
Directivity



Return Loss



Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
DD477-1	2.00 (50.80)	2.00 (50.80)	.88 (22.35)	.90 (22.86)	.156 (3.96)	1.688 (42.88)	.125 (3.18)	.38 (9.65)	-- --	.50 (12.70)	1.00 (25.40)	1.25 (31.75)	225

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.

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
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