DC Pass

High Power Splitter Combiner ZB4PD-332HP+

4 Way-0° 50Ω Up to 100W 500 to 3300 MHz

The Big Deal

- High power, up to 100W as a splitter
- Low insertion loss, 0.8 dB
- Good isolation, 22 dB

ZB4PD-332HPX-N+


ZB4PD-332HP-N+

Product Overview

Mini-Circuits' ZB4PD-332HP+ is a 4-way 0˚ splitter combiner providing very high power handling and low insertion loss across 500 to 3300 MHz, covering many wireless communications bands as well as satellite IF. Its outstanding combination of high power and low loss minimize power dissipation due to intrinsic losses and provide excellent signal fidelity from input to output. This model also provides high port-to-port isolation and very low amplitude and phase unbalance. It comes housed in a rugged aluminum alloy case with your choice of SMA or N-Type connectors and an optional heat sink for cooling.

Key Features

Feature	Advantages
Wideband, 500 to 3300 MHz	ZB4PD-332HP+ covers many popular wireless communications bands, making it suitable for a wide variety of applications.
High power handling: • 100W as a splitter • 10W as a combiner	Suitable for many high power applications.
Low insertion loss, 0.8 dB	Very low insertion loss minimizes intrinsic losses, making this model a suitable candidate for high power signal distribution applications where low loss is a requirement.
Low unbalance: • 0.2 dB amplitude unbalance • 3˚ phase unbalance	ZB4PD-332HP+ produces nearly equal output signals, ideal for parallel path / multichannel systems.
DC Passing, 0.5A (each port)	Supports applications where DC power is needed at later stages in the system.

DC Pass

High Power Splitter Combiner

ZB4PD-332HP+

4 Way-0° 50Ω Up to 100W 500 to 3300 MHz

ZB4PD-332HPX-N+ ▲

ZB4PD-332HP-N+

Maximum Ratings

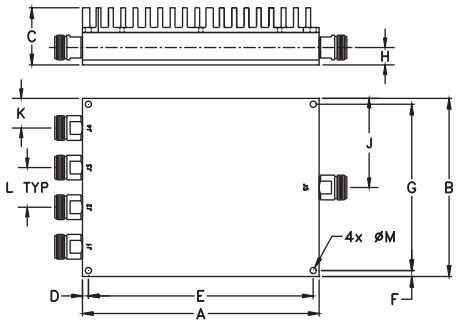
Operating Temperature	0°C to 50°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	100W max.
Internal Dissipation	45W max.
DC Current (each port)	0.5A max.

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

Coaxial Connections

SUM PORT	S
PORT 1	1
PORT 2	2
PORT 3	3
PORT 4	4

Outline Drawing

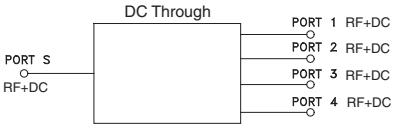


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
6.00	4.50	1.45	.15	5.700	.15	4.200
152.40	114.30	36.83	3.81	144.78	3.81	106.68

H	J	K	L	M	N	wt
.44	2.25	.75	1	.156	0.82	grams
11.18	57.15	19.05	25.40	3.96	20.83	1100

Electrical Schematic



Features

- usable, 500 to 3300 MHz
- low insertion loss, 0.8 dB typ.
- low amplitude unbalance, 0.15 dB typ.
- excellent output VSWR, 1.15:1 typ.
- DC Pass from sum port to all output ports

Applications

- high band PCS
- UNII
- WIMAX
- WiFi
- bluetooth

CASE STYLE: BV278-2

Connectors	Model
SMA	ZB4PD-332HP-S+
SMA	ZB4PD-332HPX-S+▲
N-TYPE	ZB4PD-332HP-N+
N-TYPE	ZB4PD-332HPX-N+▲

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

Electrical Specifications at 25°C

Parameter		Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range			500		3300	MHz
Insertion Loss Above 6.0 dB		700-2700 500-3300	— —	0.7 1.0	1.2 1.6	dB
Isolation		700-2700 500-3300	19 13	25 22	— —	dB
Phase Unbalance		700-2700 500-3300	— —	2.0 3.0	8.0 10.0	Degree
Amplitude Unbalance		700-2700 500-3300	— —	0.15 0.2	0.5 0.6	dB
VSWR (Port S)		700-2700 500-3300	— —	1.25 1.35	1.50 1.75	:1
VSWR (Port 1-4)		700-2700 500-3300	— —	1.15 1.25	1.25 1.55	:1
Power Input[1]	**as splitter[2]**	500-2700 2700-3300	— —	— —	100 50	W
	as combiner[1]	500-2700 2700-3300	— —	— —	10 8	

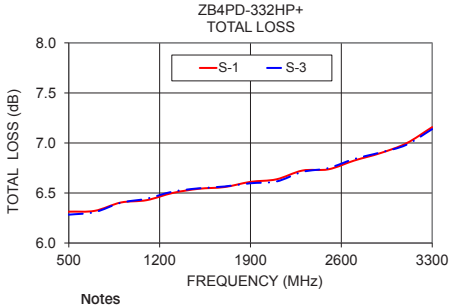
1. As a combiner of non-coherent signals, max. power per port is power rating divided by four ports.
2. All outputs must be terminated with loads (VSWR>2:1).

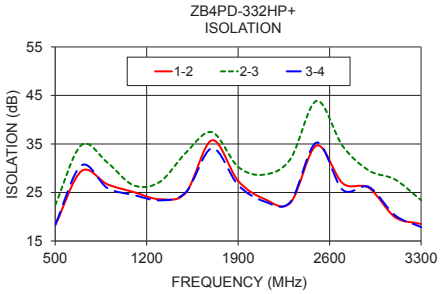
▲ Heat sink and fan not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 60°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 1.2°C/W max.

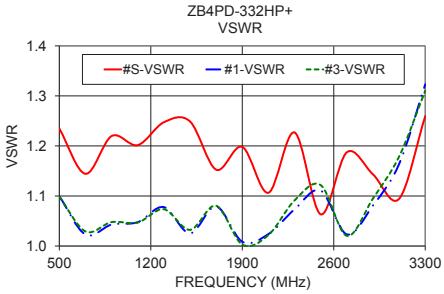
Typical Performance Data

Freq. (MHz)	Total Loss[1] (dB)				Amp. Unb. (dB)	Isolation (dB)			Phase Unb. (deg.)	VSWR S	VSWR 1	VSWR 2	VSWR 3	VSWR 4
	S-1	S-2	S-3	S-4		1-2	2-3	3-4						
500	6.31	6.32	6.28	6.28	0.04	18.21	22.40	18.34	0.34	1.23	1.10	1.10	1.10	1.10
700	6.32	6.34	6.31	6.32	0.04	29.39	34.76	30.57	0.38	1.14	1.02	1.03	1.03	1.04
900	6.40	6.45	6.40	6.38	0.07	26.67	31.14	25.90	0.47	1.22	1.04	1.05	1.05	1.06
1100	6.43	6.49	6.44	6.42	0.07	25.09	26.48	24.49	0.54	1.20	1.05	1.07	1.05	1.05
1300	6.50	6.57	6.51	6.48	0.09	23.61	27.17	23.37	0.56	1.25	1.08	1.09	1.07	1.08
1500	6.54	6.61	6.55	6.52	0.09	24.96	33.19	25.05	0.70	1.25	1.03	1.04	1.03	1.04
1700	6.56	6.63	6.56	6.53	0.11	35.77	37.42	34.12	0.80	1.15	1.08	1.09	1.08	1.10
1900	6.61	6.67	6.60	6.57	0.09	27.38	30.28	26.53	0.76	1.20	1.01	1.01	1.00	1.03
2100	6.64	6.71	6.61	6.59	0.12	23.67	28.69	23.16	0.81	1.11	1.02	1.04	1.02	1.04
2300	6.72	6.81	6.71	6.67	0.15	22.88	31.89	23.05	1.06	1.23	1.07	1.07	1.09	1.10
2500	6.74	6.84	6.75	6.68	0.16	34.66	43.86	35.28	1.11	1.06	1.11	1.09	1.12	1.15
2700	6.82	6.94	6.84	6.76	0.18	26.89	34.54	25.54	1.21	1.19	1.02	1.03	1.02	1.03
2900	6.90	7.02	6.90	6.81	0.21	25.95	29.54	26.14	1.35	1.14	1.08	1.08	1.09	1.11
3100	7.00	7.12	6.98	6.87	0.24	19.92	27.68	20.29	1.55	1.09	1.16	1.19	1.18	1.19
3300	7.16	7.23	7.14	7.05	0.18	18.51	23.41	17.88	2.15	1.26	1.32	1.32	1.31	1.35

1. Total Loss = Insertion Loss + 6dB splitter loss.







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

4 Way-0° Power Splitter/Combiner ZB4PD-332HP+

Typical Performance Data

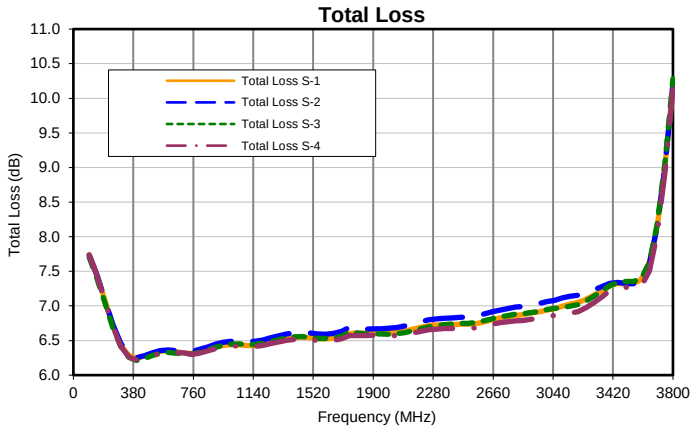
FREQ. (MHz)	TOTAL LOSS[1] (dB)				AMP UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (Deg)
	S1	S2	S3	S4		1-2	2-3	3-4	
100	7.74	7.73	7.71	7.73	0.04	5.24	12.08	5.21	0.13
150	7.44	7.44	7.39	7.44	0.05	5.68	14.03	5.64	0.14
200	7.08	7.07	7.04	7.06	0.04	6.61	15.39	6.57	0.11
250	6.73	6.73	6.69	6.70	0.05	7.85	16.47	7.81	0.11
300	6.45	6.46	6.41	6.42	0.05	9.42	17.32	9.39	0.20
350	6.29	6.30	6.26	6.26	0.04	11.28	18.24	11.26	0.22
400	6.25	6.25	6.21	6.22	0.04	13.42	19.43	13.43	0.26
450	6.28	6.28	6.24	6.24	0.04	15.75	20.84	15.81	0.28
500	6.31	6.32	6.28	6.28	0.04	18.21	22.40	18.34	0.34
550	6.34	6.36	6.31	6.32	0.04	20.58	24.31	20.83	0.38
600	6.35	6.36	6.33	6.33	0.03	22.93	26.81	23.35	0.39
650	6.34	6.35	6.32	6.32	0.03	25.52	30.17	26.21	0.38
700	6.32	6.34	6.31	6.32	0.04	29.39	34.76	30.57	0.38
750	6.31	6.34	6.30	6.30	0.04	37.14	40.26	40.31	0.40
800	6.34	6.37	6.33	6.32	0.05	39.98	39.67	37.21	0.44
850	6.37	6.41	6.36	6.35	0.06	30.50	34.36	29.34	0.45
900	6.40	6.45	6.40	6.38	0.07	26.67	31.14	25.90	0.47
950	6.43	6.48	6.43	6.41	0.07	24.90	29.27	24.28	0.51
1000	6.44	6.49	6.45	6.42	0.07	24.25	27.99	23.68	0.54
1050	6.44	6.49	6.45	6.42	0.07	24.46	27.11	23.89	0.54
1100	6.43	6.49	6.44	6.42	0.07	25.09	26.48	24.49	0.54
1150	6.43	6.49	6.44	6.41	0.08	25.72	26.24	25.09	0.54
1200	6.44	6.51	6.46	6.43	0.08	25.56	26.37	25.02	0.54
1250	6.47	6.54	6.49	6.46	0.08	24.67	26.63	24.29	0.54
1300	6.50	6.57	6.51	6.48	0.09	23.61	27.17	23.37	0.56
1350	6.53	6.59	6.54	6.50	0.09	22.95	28.00	22.82	0.60
1400	6.54	6.61	6.55	6.52	0.09	22.87	29.31	22.81	0.63
1450	6.55	6.61	6.56	6.52	0.09	23.47	31.08	23.48	0.67
1500	6.54	6.61	6.55	6.52	0.09	24.96	33.19	25.05	0.70
1550	6.53	6.59	6.53	6.50	0.10	27.71	36.11	27.96	0.72
1600	6.52	6.59	6.53	6.49	0.10	32.90	39.82	33.52	0.75
1650	6.53	6.60	6.54	6.50	0.10	45.12	40.53	43.52	0.77
1700	6.56	6.63	6.56	6.53	0.11	35.77	37.42	34.12	0.80
1750	6.60	6.69	6.62	6.57	0.12	30.26	34.02	29.29	0.76
1850	6.61	6.66	6.59	6.57	0.09	27.54	31.49	26.80	0.74
1900	6.61	6.67	6.60	6.57	0.09	27.38	30.28	26.53	0.76
1950	6.61	6.67	6.59	6.57	0.10	27.38	29.47	26.43	0.76
2000	6.61	6.68	6.59	6.57	0.11	26.68	28.91	25.75	0.77
2050	6.62	6.69	6.60	6.57	0.11	25.25	28.68	24.53	0.80
2100	6.64	6.71	6.61	6.59	0.12	23.67	28.69	23.16	0.81
2150	6.66	6.74	6.64	6.61	0.13	22.50	29.05	22.19	0.87
2200	6.69	6.77	6.67	6.63	0.14	21.90	29.65	21.72	0.96
2250	6.71	6.80	6.70	6.66	0.14	22.02	30.55	22.00	0.99
2300	6.72	6.81	6.71	6.67	0.15	22.88	31.89	23.05	1.06
2350	6.73	6.82	6.73	6.67	0.15	24.72	33.73	25.22	1.09
2400	6.73	6.83	6.74	6.68	0.15	27.75	36.20	28.95	1.11
2450	6.74	6.84	6.75	6.68	0.16	32.52	39.58	35.65	1.12
2500	6.74	6.84	6.75	6.68	0.16	34.66	43.86	35.28	1.11
2550	6.74	6.85	6.76	6.68	0.17	30.49	44.48	29.35	1.12
2600	6.77	6.88	6.78	6.71	0.17	27.72	40.16	26.50	1.12
2650	6.80	6.91	6.81	6.73	0.18	26.55	36.90	25.33	1.19
2700	6.82	6.94	6.84	6.76	0.18	26.89	34.54	25.54	1.21
2750	6.84	6.96	6.86	6.77	0.19	28.30	32.73	26.76	1.21
2800	6.86	6.98	6.88	6.78	0.20	30.18	31.22	28.60	1.25
2850	6.87	6.99	6.88	6.79	0.20	29.17	30.22	28.60	1.29
2900	6.90	7.02	6.90	6.81	0.21	25.95	29.54	26.14	1.35
2950	6.91	7.04	6.92	6.82	0.22	23.28	29.05	23.65	1.41
3000	6.94	7.06	6.95	6.84	0.22	21.68	28.97	22.05	1.47
3050	6.96	7.08	6.97	6.86	0.22	20.31	29.19	20.67	1.45
3100	7.00	7.12	6.98	6.87	0.24	19.92	27.68	20.29	1.55
3150	7.03	7.14	7.00	6.89	0.25	20.23	26.66	20.58	1.69
3200	7.05	7.15	7.02	6.92	0.24	20.51	25.60	20.64	1.85
3250	7.10	7.19	7.07	6.97	0.22	20.07	24.48	19.76	2.01
3300	7.16	7.23	7.14	7.05	0.18	18.51	23.41	17.88	2.15
3350	7.22	7.28	7.21	7.13	0.15	16.43	22.44	15.68	2.29
3400	7.29	7.32	7.29	7.22	0.11	14.40	21.61	13.67	2.33
3450	7.32	7.34	7.34	7.26	0.08	12.63	20.94	11.98	2.38
3500	7.32	7.33	7.35	7.27	0.08	11.21	20.36	10.65	2.29
3550	7.33	7.32	7.35	7.25	0.10	10.07	19.99	9.59	2.16
3600	7.40	7.38	7.40	7.29	0.11	9.12	19.85	8.73	2.20
3650	7.64	7.61	7.63	7.51	0.13	8.24	20.02	7.93	2.29
3700	8.16	8.14	8.17	8.03	0.14	7.44	20.57	7.20	2.44
3750	9.04	9.03	9.08	8.94	0.14	6.82	21.54	6.64	2.33
3800	10.22	10.20	10.28	10.13	0.16	6.48	22.84	6.37	2.18

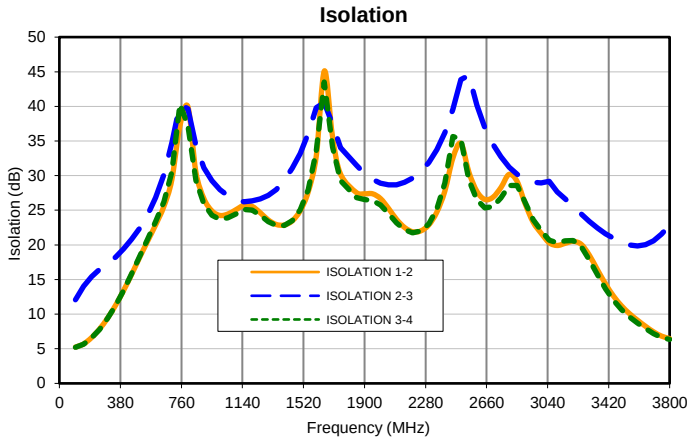
FREQ. (MHz)	VSWR (:1)				
	S	1	2	3	4
100	3.45	2.17	2.17	2.17	2.17
150	2.99	1.73	1.73	1.73	1.73
200	2.49	1.47	1.46	1.46	1.46
250	2.01	1.30	1.29	1.29	1.29
300	1.61	1.18	1.18	1.17	1.17
350	1.31	1.12	1.12	1.12	1.12
400	1.13	1.10	1.10	1.10	1.10
450	1.14	1.10	1.10	1.10	1.10
500	1.23	1.10	1.10	1.10	1.10
550	1.28	1.09	1.09	1.09	1.09
600	1.28	1.07	1.06	1.07	1.07
650	1.23	1.04	1.04	1.04	1.05
700	1.14	1.02	1.03	1.03	1.04
750	1.06	1.03	1.04	1.04	1.04
800	1.07	1.04	1.05	1.05	1.06
850	1.15	1.05	1.06	1.05	1.06
900	1.22	1.04	1.05	1.05	1.06
950	1.26	1.03	1.04	1.04	1.05
1000	1.27	1.02	1.03	1.02	1.03
1050	1.24	1.03	1.05	1.03	1.03
1100	1.20	1.05	1.07	1.05	1.05
1150	1.17	1.07	1.09	1.07	1.07
1200	1.17	1.08	1.10	1.08	1.08
1250	1.20	1.09	1.10	1.08	1.09
1300	1.25	1.08	1.09	1.07	1.08
1350	1.29	1.06	1.06	1.05	1.06
1400	1.30	1.03	1.04	1.03	1.03
1450	1.29	1.00	1.02	1.00	1.01
1500	1.25	1.03	1.04	1.03	1.04
1550	1.20	1.05	1.06	1.06	1.06
1600	1.15	1.07	1.08	1.07	1.09
1650	1.13	1.08	1.09	1.08	1.10
1700	1.15	1.08	1.09	1.08	1.10
1750	1.18	1.07	1.07	1.07	1.08
1850	1.21	1.02	1.03	1.02	1.04
1900	1.20	1.01	1.01	1.00	1.03
1950	1.16	1.02	1.03	1.02	1.04
2000	1.11	1.03	1.04	1.03	1.05
2050	1.09	1.03	1.04	1.03	1.05
2100	1.11	1.02	1.04	1.02	1.04
2150	1.15	1.01	1.02	1.02	1.02
2200	1.20	1.02	1.01	1.04	1.03
2250	1.22	1.04	1.04	1.06	1.06
2300	1.23	1.07	1.07	1.09	1.10
2350	1.20	1.10	1.09	1.12	1.13
2400	1.16	1.12	1.10	1.13	1.15
2450	1.11	1.12	1.10	1.13	1.16
2500	1.06	1.11	1.09	1.12	1.15
2550	1.07	1.09	1.07	1.09	1.13
2600	1.11	1.06	1.04	1.06	1.09
2650	1.16	1.02	1.00	1.02	1.05
2700	1.19	1.02	1.03	1.02	1.03
2750	1.20	1.05	1.07	1.06	1.06
2800	1.19	1.07	1.07	1.08	1.09
2850	1.17	1.08	1.09	1.09	1.11
2900	1.14	1.08	1.08	1.09	1.11
2950	1.12	1.08	1.08	1.10	1.11
3000	1.10	1.09	1.11	1.11	1.12
3050	1.10	1.11	1.13	1.13	1.14
3100	1.09	1.16	1.19	1.18	1.19
3150	1.10	1.22	1.25	1.24	1.26
3200	1.12	1.28	1.28	1.28	1.31
3250	1.18	1.31	1.33	1.31	1.34
3300	1.26	1.32	1.32	1.31	1.35
3350	1.35	1.31	1.30	1.29	1.33
3400	1.42	1.28	1.27	1.25	1.29
3450	1.45	1.22	1.19	1.18	1.22
3500	1.41	1.16	1.15	1.13	1.16
3550	1.29	1.13	1.13	1.11	1.14
3600	1.17	1.16	1.15	1.15	1.19
3650	1.34	1.23	1.23	1.26	1.28
3700	1.83	1.36	1.37	1.41	1.44
3750	2.63	1.57	1.58	1.64	1.67
3800	3.78	1.85	1.86	1.94	1.98

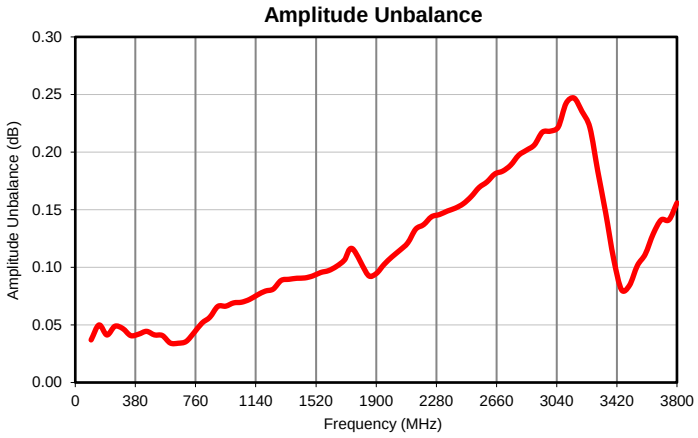
[1]Total Loss = Insertion Loss + 6dB Splitter Loss

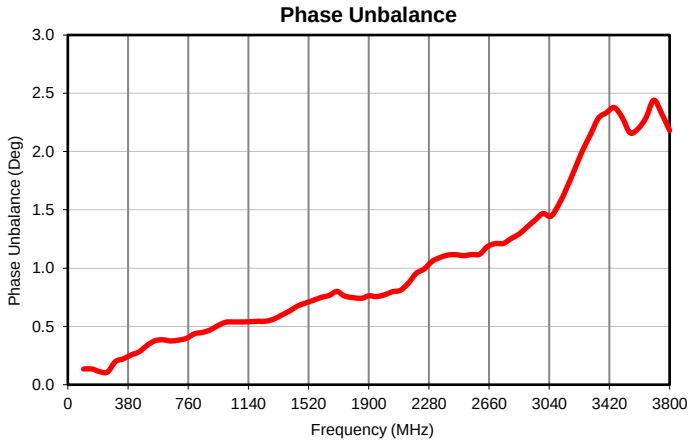
4 Way-0° Power Splitter/Combiner ZB4PD-332HP+

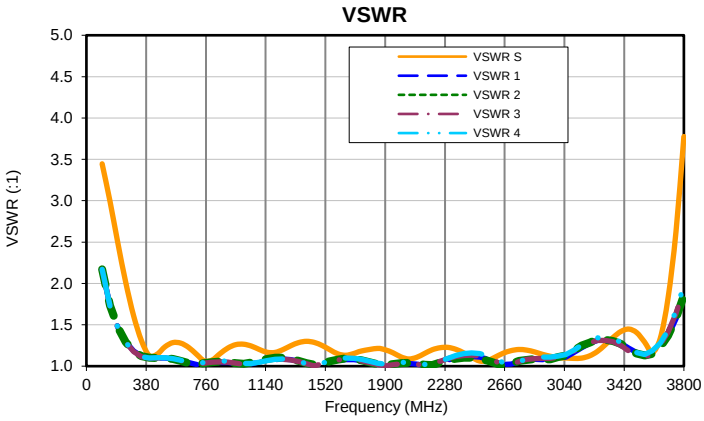
Typical Performance Curves







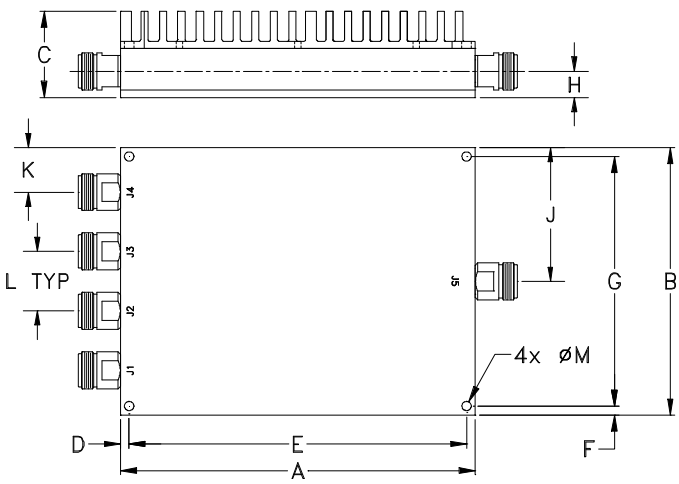


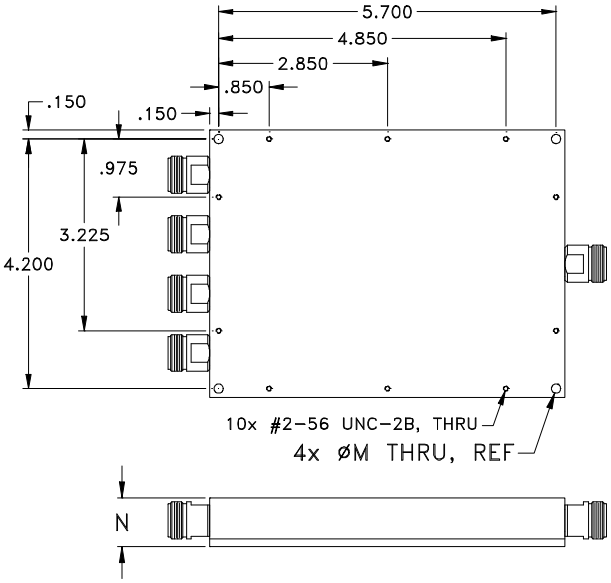


Case Style BV

Outline Dimensions

BV278-2





MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK

CASE #	A	B	C	D	E	F	G	H	J	K
BV278-2	6.00 (152.40)	4.50 (114.30)	1.45 (36.83)	.15 (3.81)	5.700 (144.78)	.15 (3.81)	4.200 (106.68)	.44 (11.18)	2.25 (57.15)	.75 (19.05)

CASE #	L	M	N	WT. GRAMS	WT. GRAMS WITHOUT HEATSINK
BV278-2	1.00 (25.40)	.156 (3.96)	.82 (20.83)	1100	800

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Heat sink finish: Black Anodize.

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Environmental Specifications **ENV28T1**

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	-0° to 50° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-40° 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