



HIGH POWER, DC PASS

# Power Splitter/Combiner

## ZB3PD-63+

Mini-Circuits

3 Way-0° 50Ω 150 to 6000 MHz

### THE BIG DEAL

- Wideband, 150 to 6000 MHz
- High power, up to 30W as a splitter
- Low insertion loss, 1.0 dB typ.
- High isolation, 20 dB typ.
- Good amplitude unbalance, 0.5 dB typ.

### APPLICATIONS

- Cellular
- PCN
- Instrumentation



Generic photo used for illustration purposes only  
CASE STYLE: UU1332

Model No.	Connectors
ZB3PD-63-N+	N-Type
ZB3PD-63-S+	SMA

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

### PRODUCT OVERVIEW

Mini-Circuits' ZB3PD-63+ is a 3-way 0° high-power splitter/combiner providing up to 30W power handling as a splitter (0.9W as a combiner) and low insertion loss across the entire 150 to 6000 MHz frequency range. Its outstanding combination of high power handling and low loss minimize power dissipation and provide excellent signal power transmission from input to output. The ZB3PD-63+ comes housed in a rugged aluminum alloy case measuring 4.5 x 6.00 x 0.88" with your choice of SMA or N-type connectors.

### KEY FEATURES

Features	Advantages
Wideband, 150 to 6000 MHz	This model supports bandwidth requirements for a wide variety of applications.
High power handling: • 30W to 4000 MHz • 20W to 6000 MHz	The ZB3PD-63+ is suitable for systems with a wide range of power requirements.
Low insertion loss, 1.0 dB	The combination of 30W power handling and low insertion loss makes this model a suitable candidate for distributing signals while maintaining excellent transmission of signal power.
High isolation, 20 dB	Minimizes interference between ports.
DC Passing, 750mA (250mA each port)	Supports applications where DC power is needed through the RF line.





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### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		150		6000	MHz
Insertion Loss (above theoretical 4.8 dB)	150-600	—	1.0	1.6	dB
	600-5000	—	0.5	2.1	
	5000-6000	—	1.5	2.2	
Isolation	150-600	8	—	—	dB
	600-5000	16	20	—	
	5000-6000	12	—	—	
Phase Unbalance	150-600	—	3	5	Degree
	600-5000	—	7	16	
	5000-6000	—	7	16	
Amplitude Unbalance	150-600	—	0.7	1.0	dB
	600-5000	—	0.5	1.0	
	5000-6000	—	0.5	1.0	
Power Handling <sup>3</sup>	As Splitter <sup>1</sup>	150-4000	—	30	W
		4000-6000	—	20	
	As Combiner <sup>2</sup>	150-6000	—	0.9	

1. All outputs must terminate 50 ohm (VSWR 1.5:1 or better)

2. As a combiner of non-coherent signals, max. power per port is 0.9 watt power rating divided by number of ports.

3. 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.

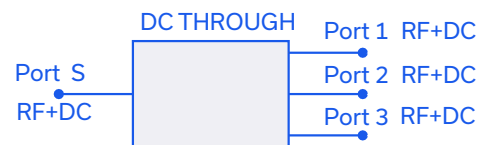
For reference, this requires thermal resistance of user's external heat sink to be 10°C/W.

### MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature (@<30W)	-55°C to 60°C
Operating Temperature (@<10W)	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	750 mA (250 mA for each port)

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

### ELECTRICAL SCHEMATIC





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## ZB3PD-63+

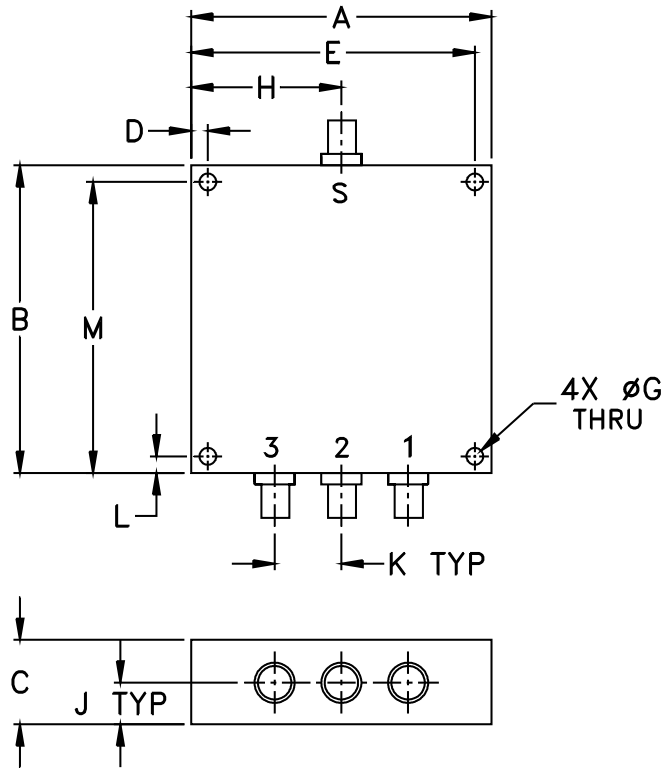
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3 Way-0° 50Ω 150 to 6000 MHz

### COAXIAL CONNECTIONS

Sum Port	S
Port 1	1
Port 2	2
Port 3	3

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G
4.50	6.00	.88	.15	4.350	-	.156
114.30	152.40	22.35	3.81	110.49	-	3.96
H	J	K	L	M	wt	
2.25	.44	1.50	0.15	5.85	grams	
57.15	11.18	38.10	3.81	148.59	760	





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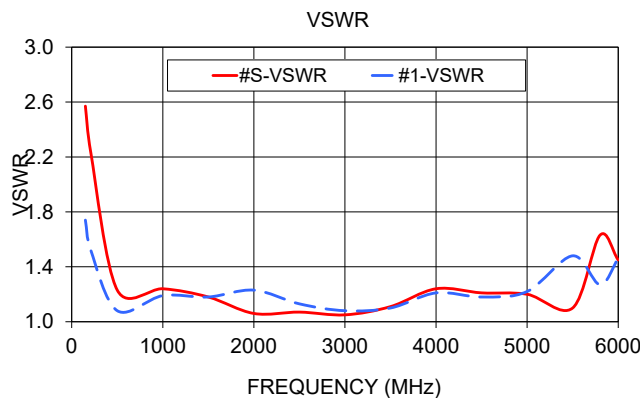
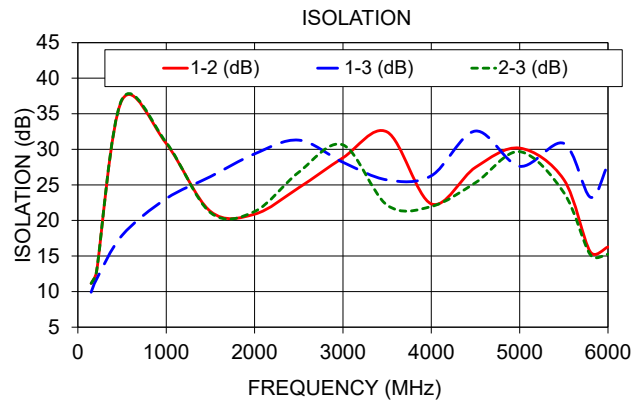
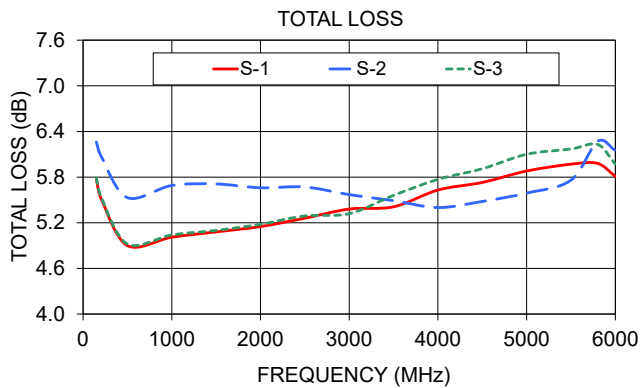
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3 Way-0° 50Ω 150 to 6000 MHz

### TYPICAL PERFORMANCE DATA AND CHARTS

Freq. (MHz)	Total Loss <sup>1</sup> (dB)			Amp Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR S	VSWR 1	VSWR 2	VSWR 3
	S-1	S-2	S-3		1-2	1-3	2-3					
150.00	5.77	6.26	5.79	0.50	11.14	9.91	11.16	1.34	2.57	1.74	1.37	1.74
210.00	5.50	6.06	5.52	0.57	12.73	11.71	12.75	0.96	2.23	1.52	1.23	1.53
500.00	4.90	5.53	4.92	0.63	36.94	17.90	37.05	0.71	1.23	1.08	1.21	1.08
1000.00	5.01	5.69	5.04	0.67	30.82	23.07	30.96	2.37	1.24	1.19	1.26	1.21
1500.00	5.08	5.71	5.10	0.63	21.28	26.16	21.10	4.33	1.18	1.18	1.38	1.20
2000.00	5.15	5.66	5.18	0.51	20.88	29.36	21.26	5.79	1.06	1.23	1.63	1.24
2500.00	5.26	5.67	5.29	0.41	24.60	31.29	26.78	6.97	1.07	1.13	1.55	1.13
3000.00	5.38	5.57	5.32	0.24	28.81	28.18	30.62	8.10	1.05	1.08	1.38	1.06
3500.00	5.41	5.49	5.56	0.15	32.44	25.70	22.15	9.08	1.11	1.10	1.17	1.12
4000.00	5.63	5.40	5.77	0.37	22.33	26.28	21.96	8.59	1.24	1.21	1.28	1.26
4500.00	5.73	5.48	5.91	0.43	27.47	32.57	25.31	6.68	1.21	1.18	1.57	1.20
5000.00	5.88	5.59	6.10	0.51	30.17	27.61	29.67	6.45	1.20	1.22	1.58	1.25
5500.00	5.97	5.76	6.17	0.41	25.74	30.83	23.91	2.67	1.10	1.48	1.57	1.46
5800.00	5.98	6.27	6.23	0.29	15.58	23.27	15.18	3.03	1.63	1.27	1.36	1.27
6000.00	5.81	6.15	5.97	0.35	16.27	27.88	15.25	6.79	1.45	1.46	1.55	1.48

1. Total Loss = Insertion Loss +4.8 dB 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



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# ZB3PD-63+

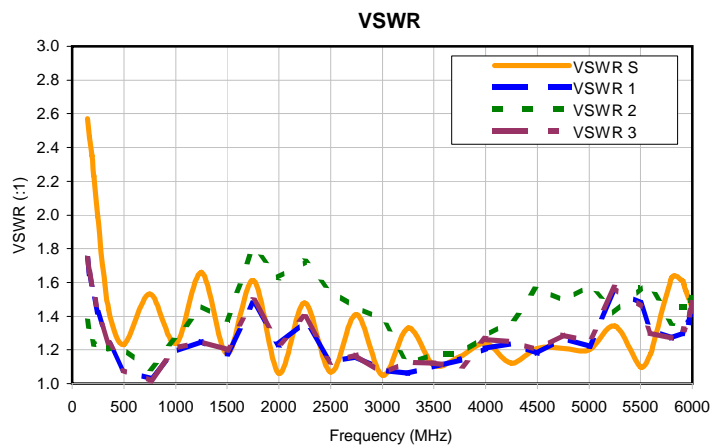
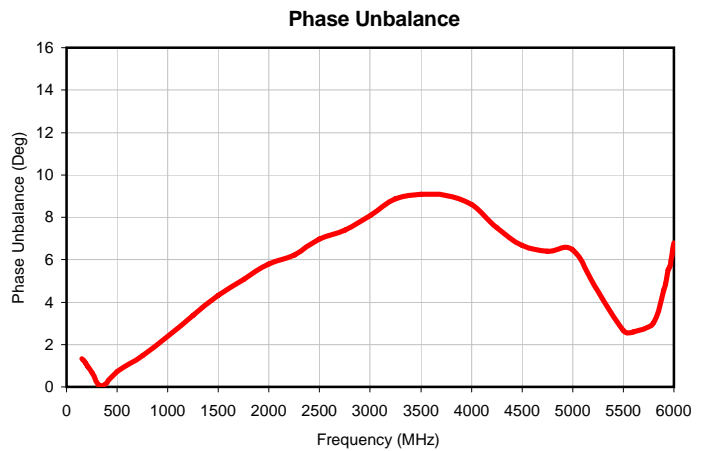
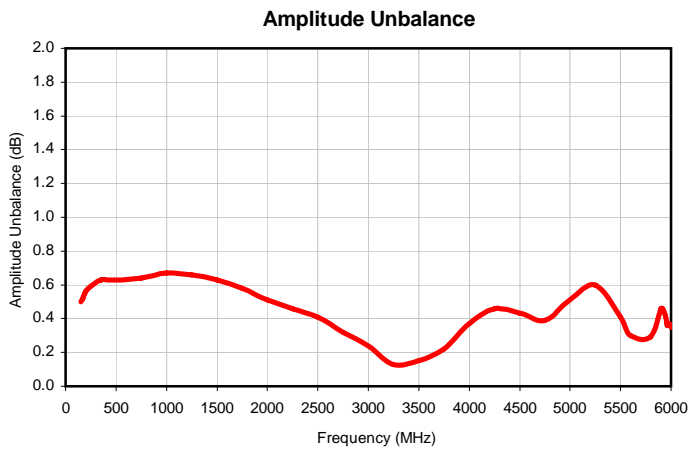
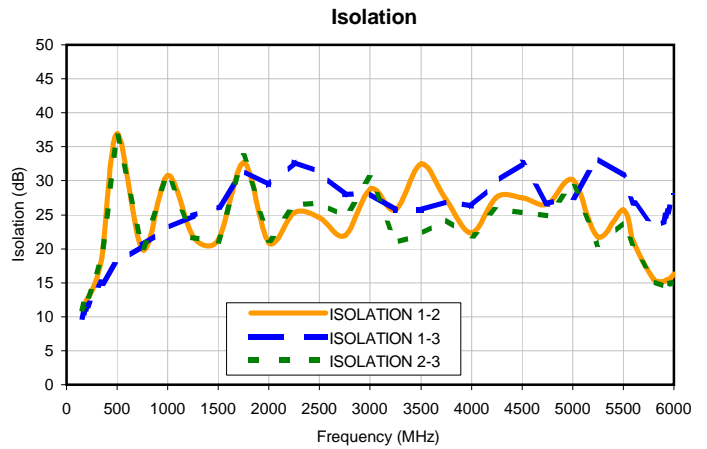
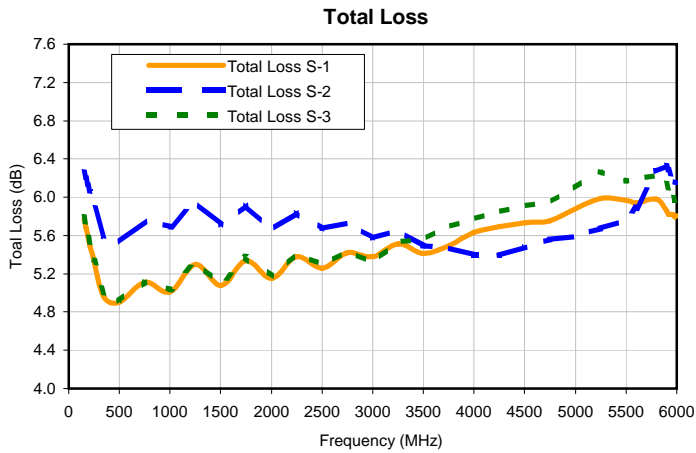
## Typical Performance Data

FREQ. (MHz)	TOTAL LOSS <sup>1</sup> (dB)			AMP UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (Deg)	FREQ. (MHz)	VSWR (:1)			
	S1	S2	S3		1-2	1-3	2-3			S	1	2	3
150.0	5.77	6.26	5.79	0.50	11.14	9.91	11.16	1.34	150.0	2.57	1.74	1.37	1.74
170.0	5.68	6.20	5.70	0.52	11.66	10.55	11.68	1.24	170.0	2.46	1.65	1.31	1.66
190.0	5.59	6.13	5.61	0.55	12.19	11.15	12.20	1.12	190.0	2.35	1.58	1.27	1.59
210.0	5.50	6.06	5.52	0.57	12.73	11.71	12.75	0.96	210.0	2.23	1.52	1.23	1.53
250.0	5.32	5.92	5.34	0.59	13.96	12.75	13.97	0.65	250.0	1.99	1.42	1.20	1.43
350.0	4.96	5.59	4.99	0.63	18.53	15.00	18.54	0.04	350.0	1.44	1.24	1.21	1.24
500.0	4.90	5.53	4.92	0.63	36.94	17.90	37.05	0.71	500.0	1.23	1.08	1.21	1.08
750.0	5.11	5.75	5.12	0.64	19.91	20.57	19.90	1.48	750.0	1.53	1.03	1.09	1.02
1000.0	5.01	5.69	5.04	0.67	30.82	23.07	30.96	2.37	1000.0	1.24	1.19	1.26	1.21
1250.0	5.30	5.96	5.32	0.66	21.77	24.90	21.64	3.38	1250.0	1.66	1.25	1.46	1.25
1500.0	5.08	5.71	5.10	0.63	21.28	26.16	21.10	4.33	1500.0	1.18	1.18	1.38	1.20
1750.0	5.34	5.92	5.37	0.58	32.70	31.45	33.65	5.08	1750.0	1.61	1.47	1.80	1.49
2000.0	5.15	5.66	5.18	0.51	20.88	29.36	21.26	5.79	2000.0	1.06	1.23	1.63	1.24
2250.0	5.38	5.84	5.41	0.46	25.37	32.74	26.39	6.22	2250.0	1.48	1.37	1.72	1.39
2500.0	5.26	5.67	5.29	0.41	24.60	31.29	26.78	6.97	2500.0	1.07	1.13	1.55	1.13
2750.0	5.42	5.73	5.43	0.32	21.90	27.92	24.81	7.40	2750.0	1.41	1.16	1.45	1.17
3000.0	5.38	5.57	5.32	0.24	28.81	28.18	30.62	8.10	3000.0	1.05	1.08	1.38	1.06
3250.0	5.51	5.65	5.53	0.13	25.75	25.72	20.95	8.87	3250.0	1.33	1.06	1.12	1.13
3500.0	5.41	5.49	5.56	0.15	32.44	25.70	22.15	9.08	3500.0	1.11	1.10	1.17	1.12
3750.0	5.49	5.47	5.69	0.22	27.19	26.91	24.30	9.04	3750.0	1.16	1.14	1.18	1.10
4000.0	5.63	5.40	5.77	0.37	22.33	26.28	21.96	8.59	4000.0	1.24	1.21	1.28	1.26
4250.0	5.69	5.39	5.85	0.46	27.63	29.89	25.81	7.51	4250.0	1.12	1.24	1.37	1.25
4500.0	5.73	5.48	5.91	0.43	27.47	32.57	25.31	6.68	4500.0	1.21	1.18	1.57	1.20
4750.0	5.75	5.56	5.95	0.39	26.56	26.66	24.87	6.39	4750.0	1.21	1.27	1.49	1.29
5000.0	5.88	5.59	6.10	0.51	30.17	27.61	29.67	6.45	5000.0	1.20	1.22	1.58	1.25
5250.0	5.99	5.67	6.27	0.60	21.77	33.29	20.60	4.53	5250.0	1.34	1.55	1.42	1.57
5500.0	5.97	5.76	6.17	0.41	25.74	30.83	23.91	2.67	5500.0	1.10	1.48	1.57	1.46
5600.0	5.94	5.89	6.19	0.30	20.99	26.66	20.57	2.60	5600.0	1.18	1.32	1.56	1.30
5800.0	5.98	6.27	6.23	0.29	15.58	23.27	15.18	3.03	5800.0	1.63	1.27	1.36	1.27
5900.0	5.86	6.33	6.14	0.46	15.17	23.98	14.47	4.56	5900.0	1.61	1.30	1.45	1.30
5920.0	5.82	6.28	6.08	0.46	15.34	24.88	14.67	4.87	5920.0	1.59	1.31	1.45	1.32
5940.0	5.82	6.24	6.06	0.42	15.45	25.38	14.78	5.52	5940.0	1.55	1.33	1.45	1.34
5960.0	5.82	6.18	6.02	0.36	15.63	26.16	14.88	5.72	5960.0	1.51	1.36	1.46	1.38
5980.0	5.79	6.16	5.97	0.37	15.93	26.90	15.05	6.20	5980.0	1.48	1.41	1.49	1.43
6000.0	5.81	6.15	5.97	0.35	16.27	27.88	15.25	6.79	6000.0	1.45	1.46	1.55	1.48

<sup>1</sup>Total Loss = Insertion Loss + 4.8dB Splitter Loss



## Typical Performance Curves





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