DC Pass

Power Splitter/Combiner ZN2PD-E653+

2-Way 0° 50Ω 10 to 65 GHz

The Big Deal

- Ultra-wideband, 10 to 65 GHz
- Low insertion loss, 1.2 dB Typ.
- High Isolation, 22 dB Typ.
- 10 W power handling
- Low amplitude unbalance, 0.1 dB Typ.



CASE STYLE: UU2234-1

Product Overview

Mini-Circuits' ZN2PD-E653+ is an ultra-wideband coaxial 2-way 0° splitter/combiner providing coverage from 10 to 65 GHz, supporting a wide range of applications including 5G, Ku-Band, K-Band, and Ka-Band SatCom, microwave point-to-point backhaul, instrumentation and many more. This model provides 10 W power handling as a splitter and very low insertion loss across the entire operating frequency range, minimizing power dissipation and delivering excellent signal power transmission from input to output. The ZN2PD-E653+ comes housed in a rugged aluminum alloy case measuring 1.0 × 1.0 × 0.37" with 1.85 mm connectors.

Key Features

Feature	Advantages
Ultra-wideband, 10 to 65 GHz	Extremely wide frequency range supports many broadband applications in a single model.
Low insertion loss, 1.2 dB	The combination of 10 W power handling and low insertion loss makes this model a suitable candidate for distributing signals while maintaining excellent transmission of signal power.
High isolation, 22 dB	Minimizes interference between ports.
High power handling, 10 W	The ZN2PD-E653+ is suitable for systems with a wide range of power requirements.
Low amplitude unbalance, 1.2 dB	Produces nearly equal output signals, ideal for parallel path and multichannel systems.
DC Passing, 440 mA	Supports applications where DC power is needed through the RF line.

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

DC Pass

Power Splitter/Combiner

ZN2PD-E653+

2-Way 0° 50Ω 10 to 65 GHz



Generic photo used for illustration purposes only

CASE STYLE: UU2234-1

Connectors	Model
1.85 mm Female	ZN2PD-E653+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55 °C to +100 °C
Storage Temperature	-55 °C to +100 °C
Power Input (as a splitter)*	10 W max.
Internal Dissipation	1 W max.
DC Current	440 mA

Permanent damage may occur if any of these limits are exceeded.
*Assume output match of 2.0:1 or better. Derate linearly to 10% with arbitrary load.

Coaxial Connections

SUM PORT	S
PORT 1	1
PORT 2	2

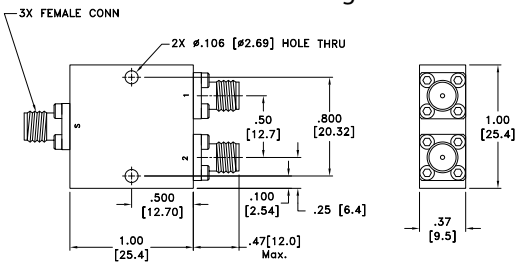
Features

- Super wideband, 10 to 65 GHz
- Low insertion loss, 1.2 dB typ.
- Excellent isolation, 22 dB typ.

Applications

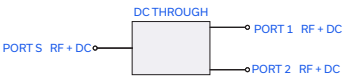
- 5G
- Fixed satellite
- Mobile
- Space research

Outline Drawing



Weight: 35 grams MAX
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03[.76]; 3 Pl. ±.010[.25] Inches[mm]

Electrical Schematic



Electrical Specifications at +25 °C

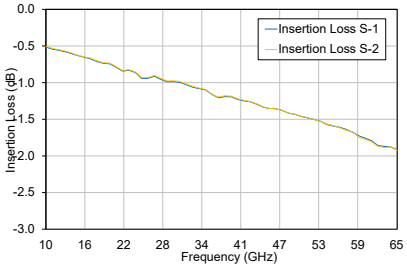
Parameter	Frequency (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		10		65	GHz
Insertion Loss Above 3.0 dB	10 - 50	—	1.0	2.7	dB
	50 - 65	—	1.7	4.7	
Isolation	10 - 50	14.6	33	—	dB
	50 - 65	14.6	36	—	
Phase Unbalance	10 - 50	—	1.8	15	Degree
	50 - 65	—	3.5	15	
Amplitude Unbalance	10 - 50	—	0.03	1.5	dB
	50 - 65	—	0.06	1.5	
VSWR (Port S)	10 - 50	—	1.10	2.2	:1
	50 - 65	—	1.11	2.6	
VSWR (Port 1-2)	10 - 50	—	1.11	2.2	:1
	50 - 65	—	1.13	2.6	

Typical Performance Data

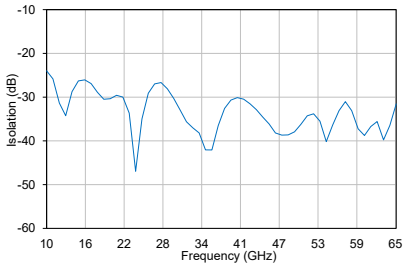
Frequency (MHz)	Total Loss[1] (dB) S-1	Total Loss[1] (dB) S-2	Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
10	3.51	3.50	0.01	23.99	0.56	1.13	1.13	1.13
12	3.56	3.55	0.02	31.35	0.69	1.07	1.04	1.04
14	3.60	3.59	0.02	28.75	0.81	1.05	1.11	1.11
16	3.65	3.65	0.02	26.05	0.89	1.04	1.15	1.15
18	3.71	3.70	0.02	28.90	1.05	1.09	1.03	1.02
20	3.74	3.73	0.02	30.36	1.16	1.03	1.03	1.01
25	3.94	3.93	0.03	34.97	1.46	1.25	1.27	1.28
30	3.99	3.98	0.03	30.30	1.78	1.12	1.05	1.06
35	4.10	4.09	0.04	42.06	2.09	1.04	1.08	1.10
40	4.23	4.22	0.04	30.11	2.40	1.14	1.07	1.07
45	4.35	4.35	0.05	36.13	2.63	1.11	1.12	1.12
50	4.46	4.46	0.05	36.23	3.00	1.07	1.07	1.06
55	4.59	4.59	0.06	36.36	3.40	1.06	1.12	1.08
60	4.76	4.77	0.05	38.77	3.74	1.08	1.18	1.18
65	4.92	4.92	0.06	31.54	4.08	1.19	1.11	1.12

1. Total Loss = Insertion Loss + 3 dB splitter loss.

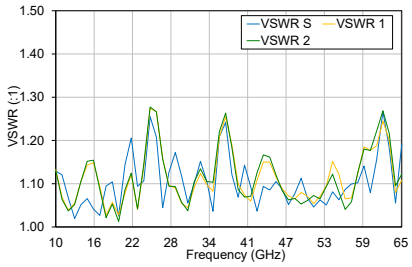
Insertion Loss[2]



Isolation 1-2



VSWR



2. Insertion loss is loss above theoretical loss (-3dB)

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REV. A
ECO-018692
ZN2PD-E653+
MCL NY
260514

2 Way-0° Power Splitter/Combiner ZN2PD-E653+

Typical Performance Data

Data tested at 25DegC

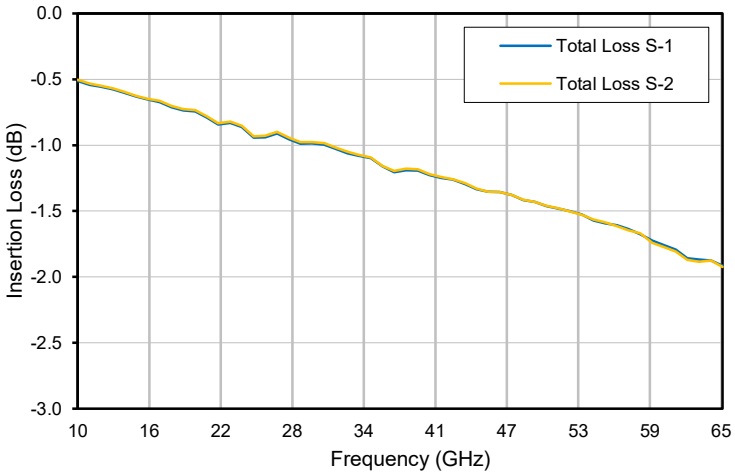
FREQ. (GHz)	INSERTION LOSS[1] (dB)		AMP. UNBAL.[2] (dB)	ISOLATION (dB)	PHASE UNBAL.[3] (deg.)	VSWR (:1)		
	S-1	S-2		1-2		S	1	2
10	0.5	0.5	0.01	24	0.6	1.13	1.13	1.13
11	0.5	0.5	0.02	26	0.6	1.12	1.07	1.06
12	0.6	0.6	0.02	31	0.7	1.07	1.04	1.04
13	0.6	0.6	0.02	34	0.8	1.02	1.06	1.05
14	0.6	0.6	0.02	29	0.8	1.05	1.11	1.11
15	0.6	0.6	0.02	26	0.8	1.07	1.14	1.15
16	0.7	0.6	0.02	26	0.9	1.04	1.15	1.15
17	0.7	0.7	0.02	27	1.0	1.03	1.09	1.09
18	0.7	0.7	0.02	29	1.1	1.09	1.03	1.02
19	0.7	0.7	0.02	30	1.1	1.10	1.06	1.05
20	0.7	0.7	0.02	30	1.2	1.03	1.03	1.01
21	0.8	0.8	0.02	30	1.2	1.14	1.08	1.09
22	0.8	0.8	0.03	30	1.3	1.21	1.12	1.12
23	0.8	0.8	0.03	34	1.3	1.09	1.04	1.04
24	0.9	0.9	0.03	47	1.4	1.11	1.14	1.15
25	0.9	0.9	0.03	35	1.5	1.25	1.27	1.28
26	0.9	0.9	0.03	29	1.5	1.21	1.27	1.27
27	0.9	0.9	0.03	27	1.6	1.04	1.16	1.16
28	1.0	0.9	0.03	27	1.7	1.13	1.10	1.09
29	1.0	1.0	0.03	28	1.7	1.17	1.09	1.09
30	1.0	1.0	0.03	30	1.8	1.12	1.05	1.06
31	1.0	1.0	0.04	33	1.9	1.06	1.04	1.04
32	1.0	1.0	0.04	36	1.9	1.10	1.09	1.10
33	1.1	1.1	0.04	37	2.0	1.15	1.12	1.13
34	1.1	1.1	0.04	38	2.0	1.11	1.10	1.11
35	1.1	1.1	0.04	42	2.1	1.04	1.08	1.10
36	1.2	1.2	0.04	42	2.1	1.21	1.21	1.22
37	1.2	1.2	0.04	37	2.2	1.24	1.25	1.26
38	1.2	1.2	0.04	33	2.2	1.12	1.19	1.18
39	1.2	1.2	0.04	31	2.3	1.07	1.10	1.09
40	1.2	1.2	0.04	30	2.4	1.14	1.07	1.07
41	1.2	1.2	0.04	30	2.5	1.09	1.06	1.07
42	1.3	1.3	0.05	32	2.5	1.04	1.11	1.13
43	1.3	1.3	0.06	33	2.5	1.09	1.15	1.17
44	1.3	1.3	0.05	35	2.6	1.09	1.15	1.16
45	1.4	1.4	0.05	36	2.6	1.11	1.12	1.12
46	1.4	1.4	0.05	38	2.7	1.09	1.09	1.08
47	1.4	1.4	0.05	39	2.8	1.05	1.07	1.06
48	1.4	1.4	0.05	39	2.9	1.08	1.06	1.07
49	1.4	1.4	0.06	38	3.0	1.11	1.08	1.05
50	1.5	1.5	0.05	36	3.0	1.07	1.07	1.06
51	1.5	1.5	0.05	34	3.1	1.05	1.05	1.07
52	1.5	1.5	0.05	34	3.2	1.06	1.07	1.06
53	1.5	1.5	0.06	35	3.2	1.05	1.09	1.09
54	1.6	1.6	0.07	40	3.2	1.08	1.15	1.12
55	1.6	1.6	0.06	36	3.4	1.06	1.12	1.08
56	1.6	1.6	0.06	33	3.5	1.09	1.07	1.04
57	1.6	1.6	0.05	31	3.6	1.10	1.07	1.06
58	1.7	1.7	0.05	33	3.6	1.10	1.12	1.13
59	1.7	1.7	0.05	37	3.7	1.14	1.19	1.18
60	1.8	1.8	0.05	39	3.7	1.08	1.18	1.18
61	1.8	1.8	0.05	37	3.8	1.16	1.19	1.22
62	1.9	1.9	0.05	36	3.8	1.27	1.25	1.27
63	1.9	1.9	0.06	40	3.8	1.18	1.20	1.22
64	1.9	1.9	0.06	36	4.0	1.06	1.08	1.10
65	1.9	1.9	0.06	32	4.1	1.19	1.11	1.12

1. Insertion loss is loss above theoretical loss (3dB)
2. Amplitude unbalance is average unbalance between any ports
3. Phase unbalance is average unbalance between any ports

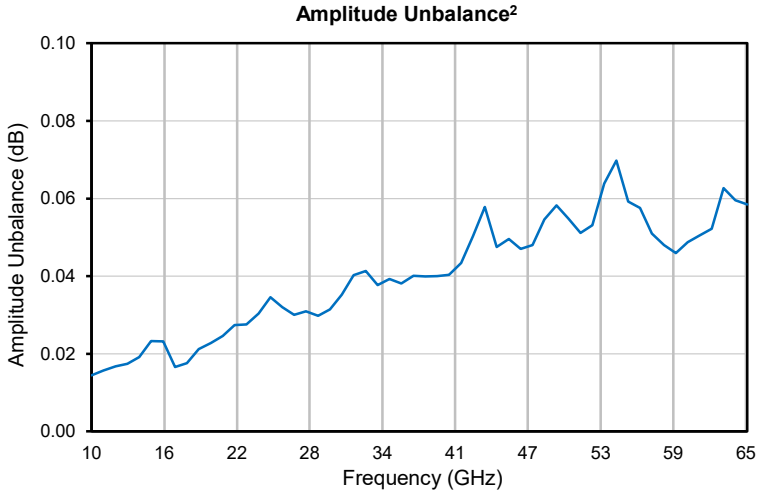
2 Way-0° Power Splitter/Combiner ZN2PD-E653+

Typical Performance Curves

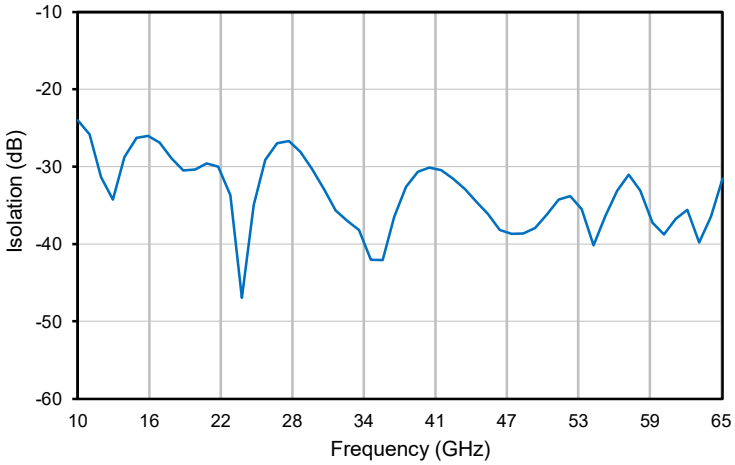
Insertion Loss[1]



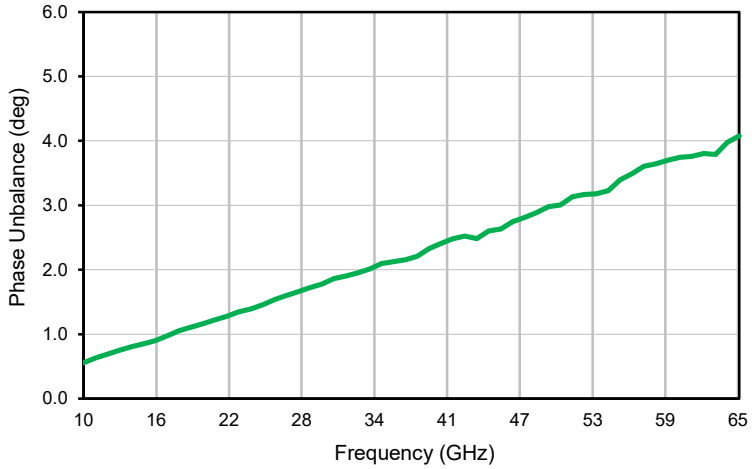
Amplitude Unbalance[2]



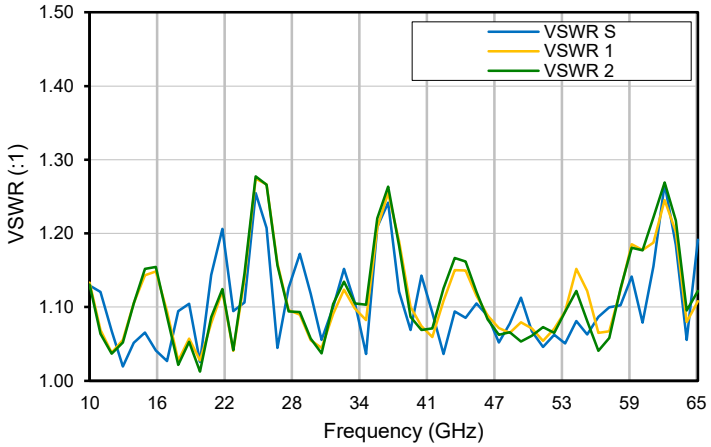
Isolation 1-2



Phase Unbalance[3]



VSWR

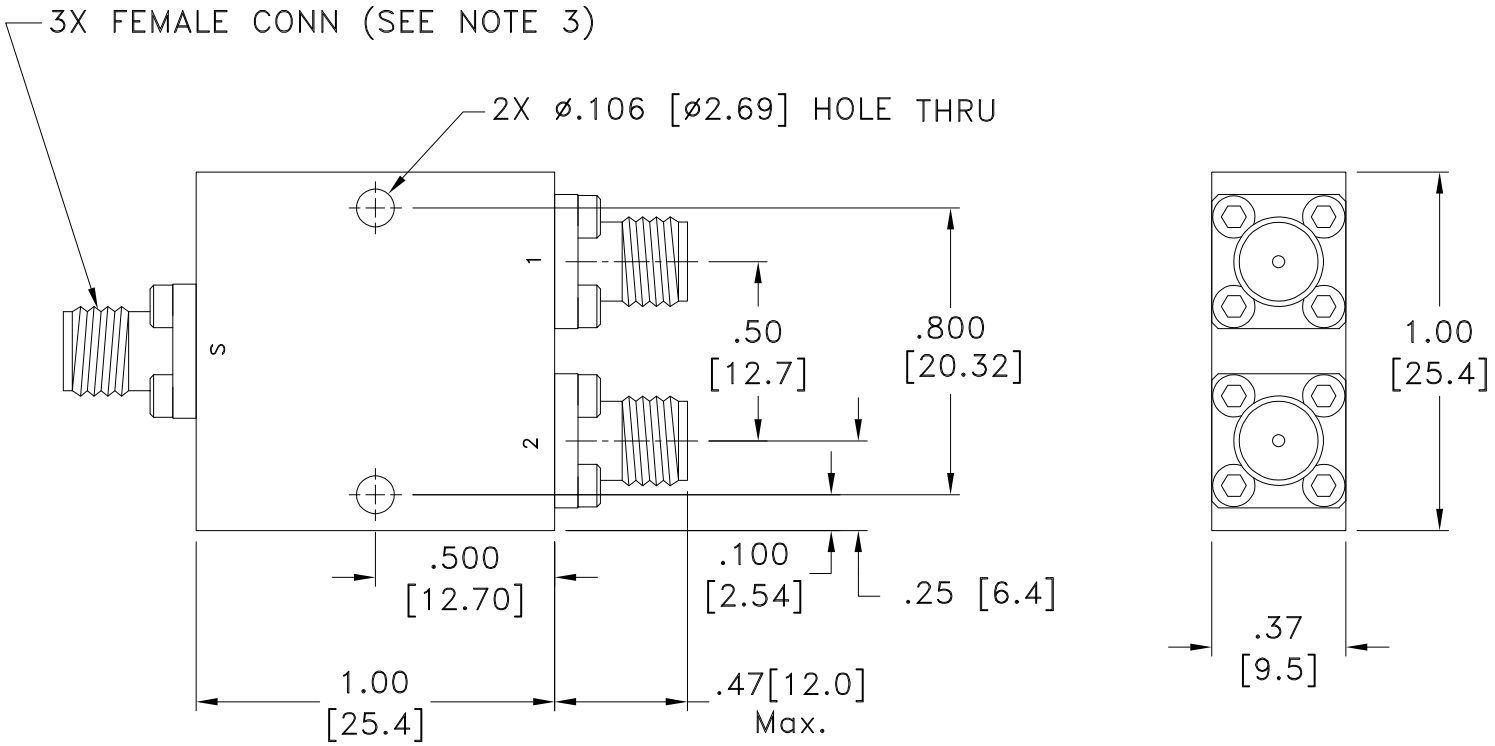


Note:
1. Insertion loss is loss above theoretical loss (3dB)
2. Amplitude unbalance is average unbalance between any ports
3. Phase unbalance is average unbalance between any ports

Case Style UU

Outline Dimensions

UU2234-1



Weight: 35 grams MAX

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03[.76]; 3 Pl. ±.010[.25] Inches[mm]

Notes:

1. Case material: Aluminum Alloy.
2. Case Finish: Nickel plating
3. Refer to the individual model data sheet for the type of connectors available.

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Mini-Circuits

Environmental Specifications **ENV102**

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
Thermal Shock	-55° to 100°C, 25 cycles	MIL-STD-202, Method 107, Condition A-1 except +100°C instead of 85°C
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
Connector Durability	500 mating/unmating cycles	MIL-PRF-39012E, PARAGRAPH 4.6.12

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