



CAVITY COAXIAL

# Bandpass Filter

## ZVBP-15R4G-S+

Mini-Circuits

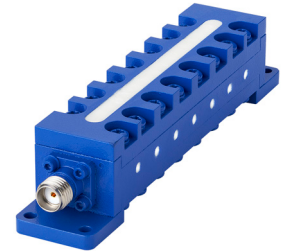
50Ω 13.05 to 17.75 GHz SMA Female

### KEY FEATURES

- Low Insertion Loss, 1.0 dB Typ.
- Good Return Loss, 17 dB Typ.
- High Rejection, 90 dB Typ.
- Stopband up to 25 GHz
- Power Handling 15 Watts

### APPLICATIONS

- Test and measurements

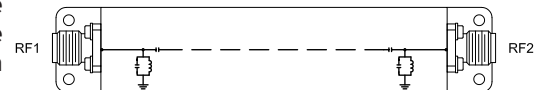


Generic photo used for illustration purposes only

### PRODUCT OVERVIEW

Mini-Circuits' ZVBP-15R4G-S+ is a coaxial cavity filter designed by implementing resonant structures with very high Q and are ideal for narrow-band, high-selectivity applications. Mini-Circuits' coaxial cavity filters feature a special protective assembly to prevent accidental de-tuning that would otherwise require expensive replacement or return to factory for re-tuning. Precise machining allows realization of cavity filters with small form factors for applications where size is critical.

### FUNCTIONAL DIAGRAM



### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	15.4	—	GHz
	Insertion Loss	F1-F2	13.05 - 17.75	—	1.0	1.5	dB
	Return Loss	F1-F2	13.05 - 17.75	12	17	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 11.75	70	90	—	dB
		F3-F4	11.75 - 12.55	40	45	—	
Stop Band, Upper	Rejection	F5-F6	18.25 - 21	38	43	—	dB
		F6-F7	21 - 25	70	88	—	

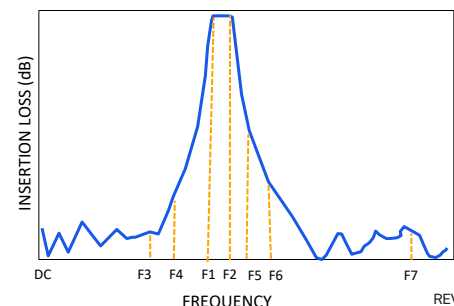
1. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

### ABSOLUTE MAXIMUM RATINGS<sup>2,3</sup>

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power <sup>4</sup>	15 W max. at +25°C

2. Permanent damage may occur if any of these limits are exceeded.  
 3. Input and output ports are DC short to ground.  
 4. Power rating applies only to signals within the passband.

### TYPICAL FREQUENCY RESPONSE AT +25°C



REV. OR  
 ECO-023023  
 ZVBP-15R4G-S+  
 EDU4827  
 URJ  
 240913





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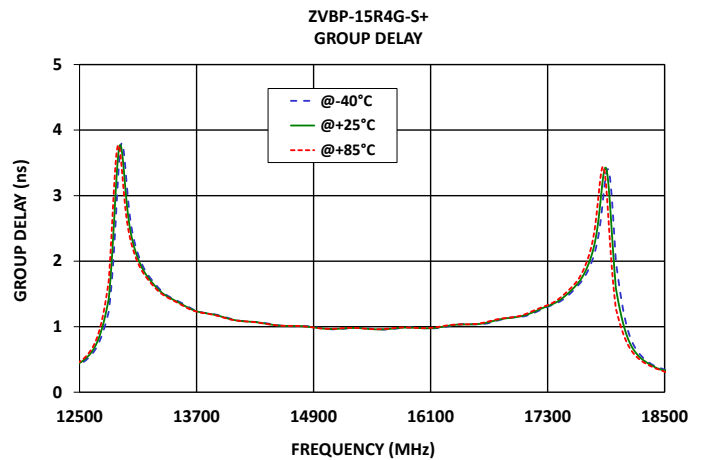
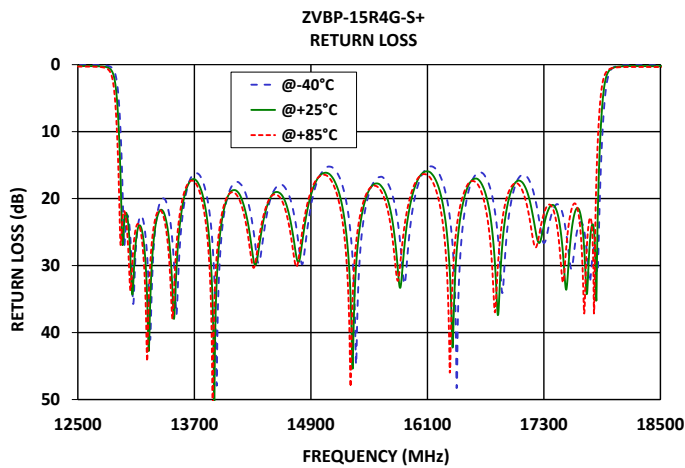
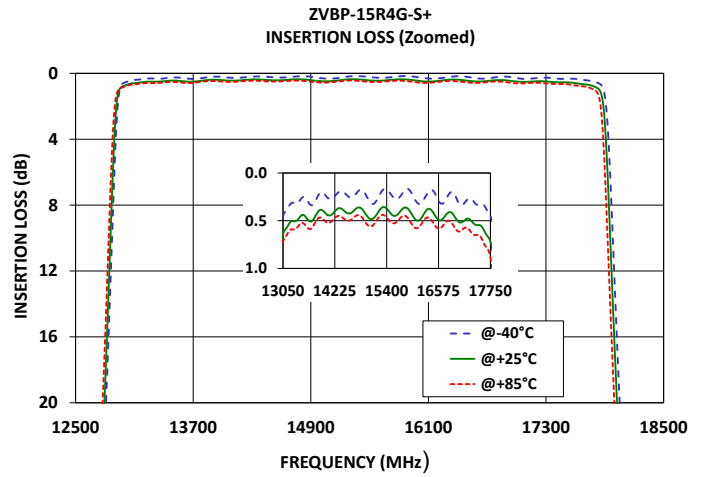
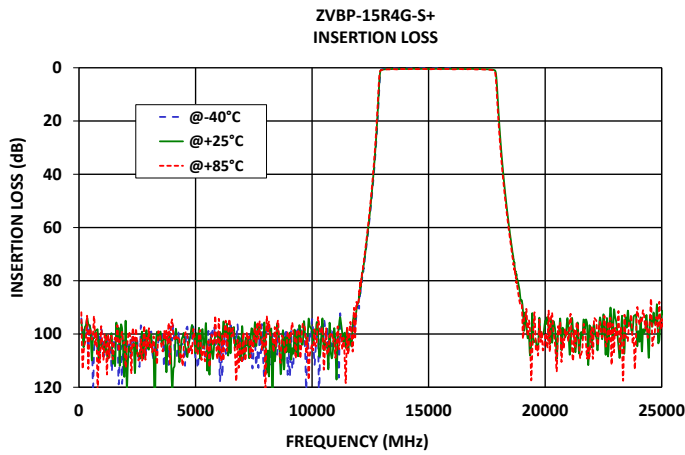
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### TYPICAL PERFORMANCE GRAPHS





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## ZVBP-15R4G-S+

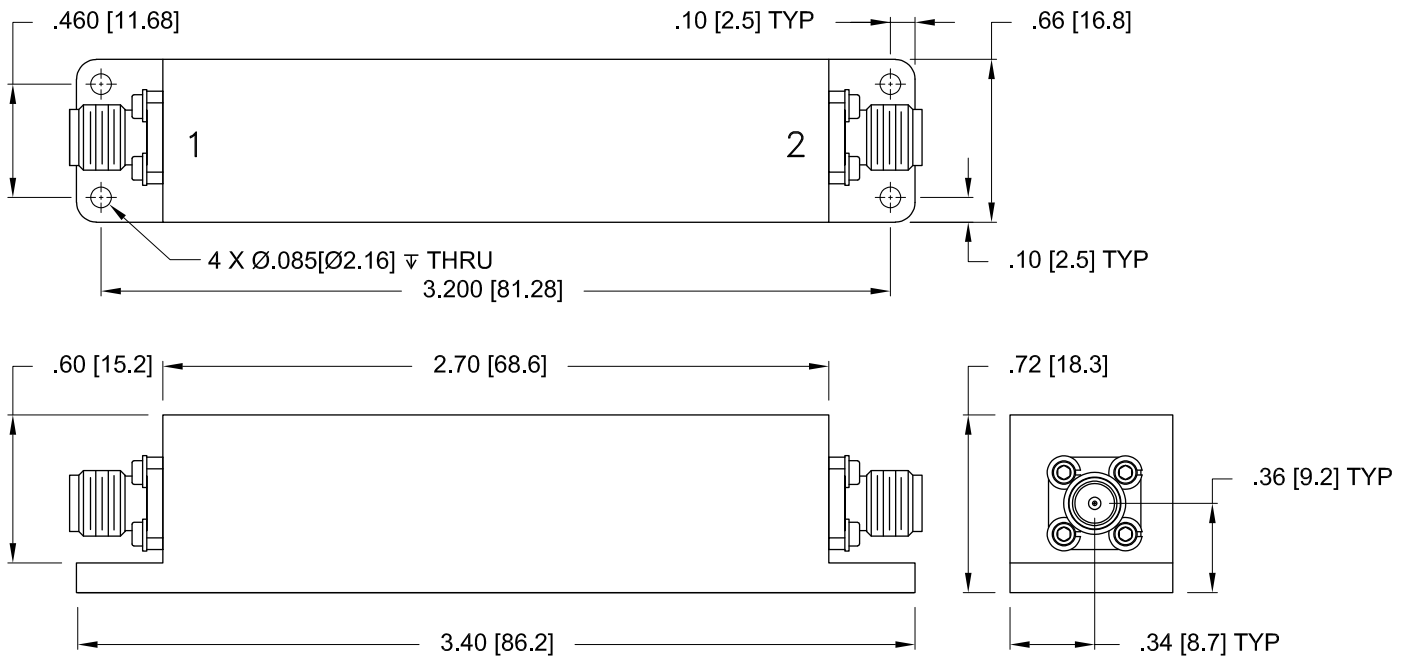
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50Ω 13.05 to 17.75 GHz SMA Female

### CONNECTOR DESCRIPTION

Function	Marking on Unit	Connector
RF1 <sup>1</sup>	1	SMA Female
RF2 <sup>1</sup>	2	SMA Female

### CASE STYLE DRAWING



Unit Weight: 62 Grams.

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .100(2.54); 3 Pl. ± .015(.381)

### PRODUCT MARKING\*: ZVBP-15R4G-S+

\*Marking may contain other features or characters for internal lot control.



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Mini-Circuits

50Ω 13.5 to 17.75 GHz SMA Female

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	AAB3552
RoHS Status	Compliant
Environmental Ratings	ENV46

#### 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)



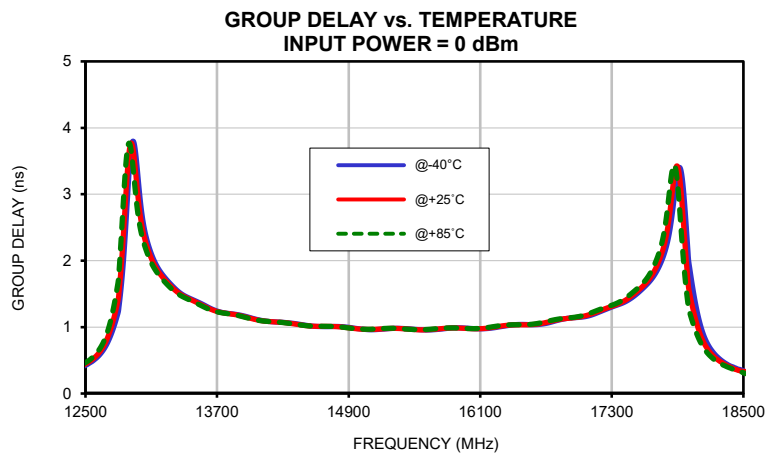
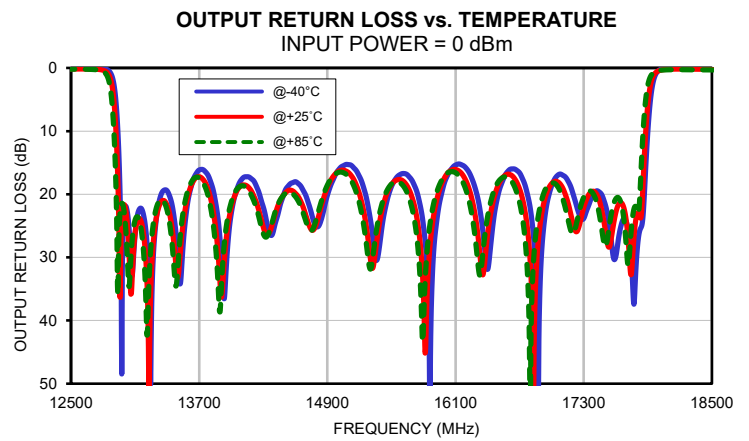
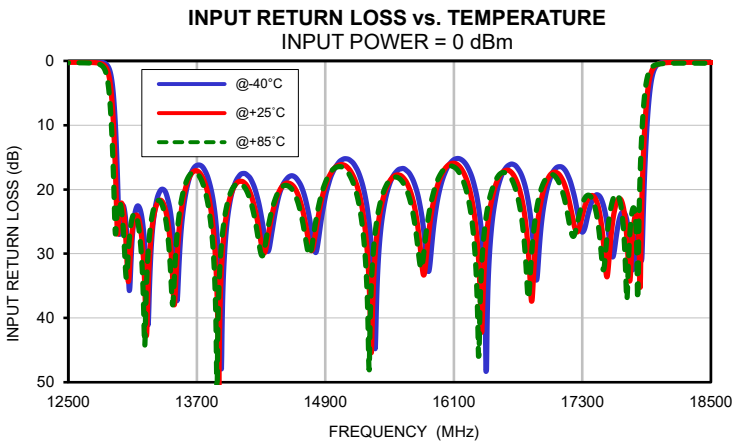
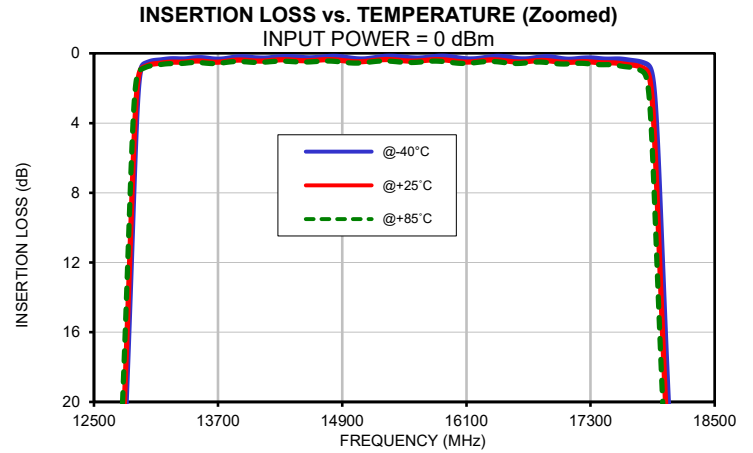
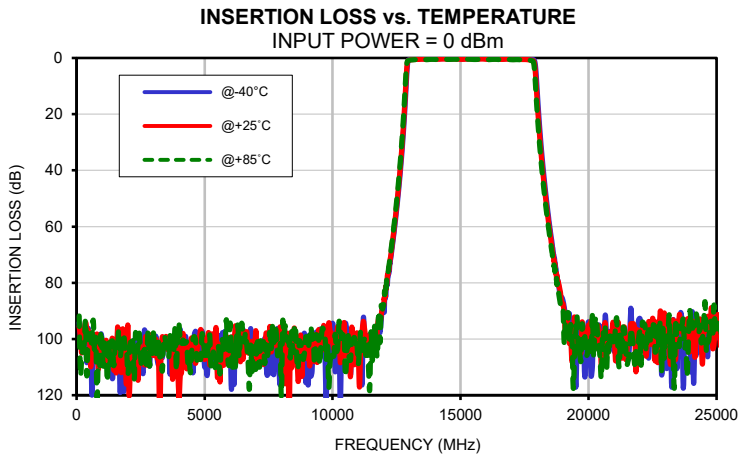
Typical Performance Data

FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	94.11	95.48	91.82	0.01	0.02	0.03	0.00	0.02	0.02
200	98.32	105.00	106.66	0.03	0.03	0.05	0.02	0.04	0.04
300	101.06	96.69	101.61	0.04	0.05	0.06	0.03	0.06	0.06
500	99.19	98.71	99.03	0.06	0.07	0.09	0.05	0.08	0.09
1000	100.66	105.16	104.16	0.06	0.09	0.11	0.02	0.07	0.08
1200	101.18	107.89	115.22	0.05	0.09	0.11	0.02	0.08	0.09
1500	102.93	106.68	103.35	0.05	0.08	0.11	0.01	0.07	0.09
1600	98.83	95.89	102.82	0.04	0.08	0.11	0.00	0.06	0.08
2000	102.90	95.00	112.62	0.03	0.07	0.10	0.02	0.05	0.06
2200	108.81	106.68	101.72	0.02	0.06	0.09	0.03	0.04	0.06
2400	104.12	114.71	102.20	0.01	0.05	0.09	0.04	0.04	0.05
2600	111.92	107.05	108.01	0.00	0.05	0.08	0.05	0.03	0.04
2800	100.58	103.60	96.82	0.01	0.04	0.07	0.06	0.02	0.04
3000	104.49	105.82	97.82	0.02	0.04	0.07	0.07	0.01	0.03
4000	102.31	121.30	94.54	0.05	0.02	0.05	0.09	0.00	0.02
5000	109.92	107.31	104.76	0.05	0.02	0.07	0.09	0.01	0.04
6000	102.92	107.83	94.30	0.02	0.06	0.10	0.07	0.05	0.07
7000	109.96	97.01	110.49	0.01	0.10	0.16	0.04	0.09	0.12
8000	101.11	103.19	120.36	0.05	0.14	0.21	0.00	0.13	0.17
9000	107.35	106.95	100.60	0.09	0.19	0.25	0.03	0.17	0.21
10000	94.38	99.31	104.14	0.13	0.22	0.29	0.07	0.21	0.25
11750	98.98	95.85	106.07	0.13	0.24	0.31	0.04	0.21	0.25
12550	49.71	48.22	46.57	0.07	0.22	0.29	0.04	0.17	0.20
12730	30.98	28.90	26.55	0.08	0.25	0.35	0.03	0.21	0.27
12790	23.08	20.68	17.91	0.14	0.35	0.53	0.05	0.32	0.47
12915	3.44	2.12	1.36	4.19	7.87	14.52	4.32	8.25	15.54
13050	0.45	0.64	0.71	28.41	31.78	32.73	27.11	32.06	33.54
15400	0.17	0.37	0.47	29.68	24.65	23.01	26.66	23.46	22.26
16000	0.24	0.46	0.56	18.13	17.23	17.01	17.97	17.29	17.01
16500	0.22	0.45	0.55	20.49	18.86	18.29	19.96	18.53	18.03
17000	0.29	0.50	0.61	18.26	17.72	17.71	18.64	18.31	18.20
17750	0.45	0.72	0.89	29.56	32.94	25.40	31.62	31.91	24.71
18000	12.75	16.62	20.37	0.60	0.55	0.53	0.43	0.46	0.42
18250	41.61	44.01	46.43	0.08	0.22	0.34	0.02	0.19	0.28
18400	54.00	55.93	57.93	0.09	0.23	0.35	0.01	0.21	0.30
18800	79.22	79.21	81.78	0.13	0.27	0.39	0.04	0.26	0.33
20000	94.05	95.02	101.04	0.14	0.30	0.40	0.06	0.31	0.36
20200	96.24	103.69	106.75	0.13	0.30	0.40	0.07	0.32	0.38
20400	95.03	96.64	101.68	0.14	0.31	0.41	0.08	0.33	0.38
20600	103.64	98.81	100.18	0.13	0.31	0.40	0.06	0.33	0.37
20800	102.74	99.17	105.48	0.11	0.30	0.39	0.04	0.31	0.35
21000	104.48	97.59	102.71	0.11	0.30	0.39	0.03	0.30	0.34
21200	104.89	98.80	109.98	0.10	0.29	0.38	0.03	0.30	0.34
21400	102.53	95.84	96.61	0.09	0.29	0.37	0.02	0.30	0.34
21600	101.38	101.66	105.71	0.08	0.28	0.36	0.02	0.30	0.33
21800	99.41	96.14	109.24	0.08	0.28	0.36	0.00	0.28	0.32
22000	92.63	105.04	97.73	0.08	0.27	0.35	0.02	0.27	0.30
22200	97.69	101.44	95.16	0.07	0.26	0.34	0.02	0.26	0.29
22400	95.28	96.34	99.54	0.05	0.25	0.33	0.03	0.25	0.28
22600	99.74	107.84	104.52	0.04	0.25	0.31	0.04	0.24	0.27
22800	98.06	90.05	94.08	0.04	0.23	0.31	0.06	0.23	0.25
23000	97.61	93.57	97.78	0.03	0.23	0.30	0.07	0.21	0.24
23200	97.77	109.01	106.41	0.02	0.22	0.29	0.08	0.20	0.22
23400	95.97	107.11	93.23	0.00	0.20	0.27	0.10	0.18	0.21
23600	90.55	96.40	95.58	0.00	0.19	0.27	0.12	0.17	0.19
23800	97.73	93.43	101.51	0.02	0.18	0.26	0.14	0.16	0.18
24000	111.73	98.93	93.50	0.02	0.17	0.25	0.14	0.14	0.18
24400	100.09	101.18	101.31	0.05	0.15	0.23	0.19	0.10	0.13
24800	97.49	88.98	93.76	0.07	0.13	0.22	0.21	0.07	0.12
25000	99.58	92.57	94.29	0.08	0.12	0.22	0.23	0.06	0.12

## Typical Performance Data

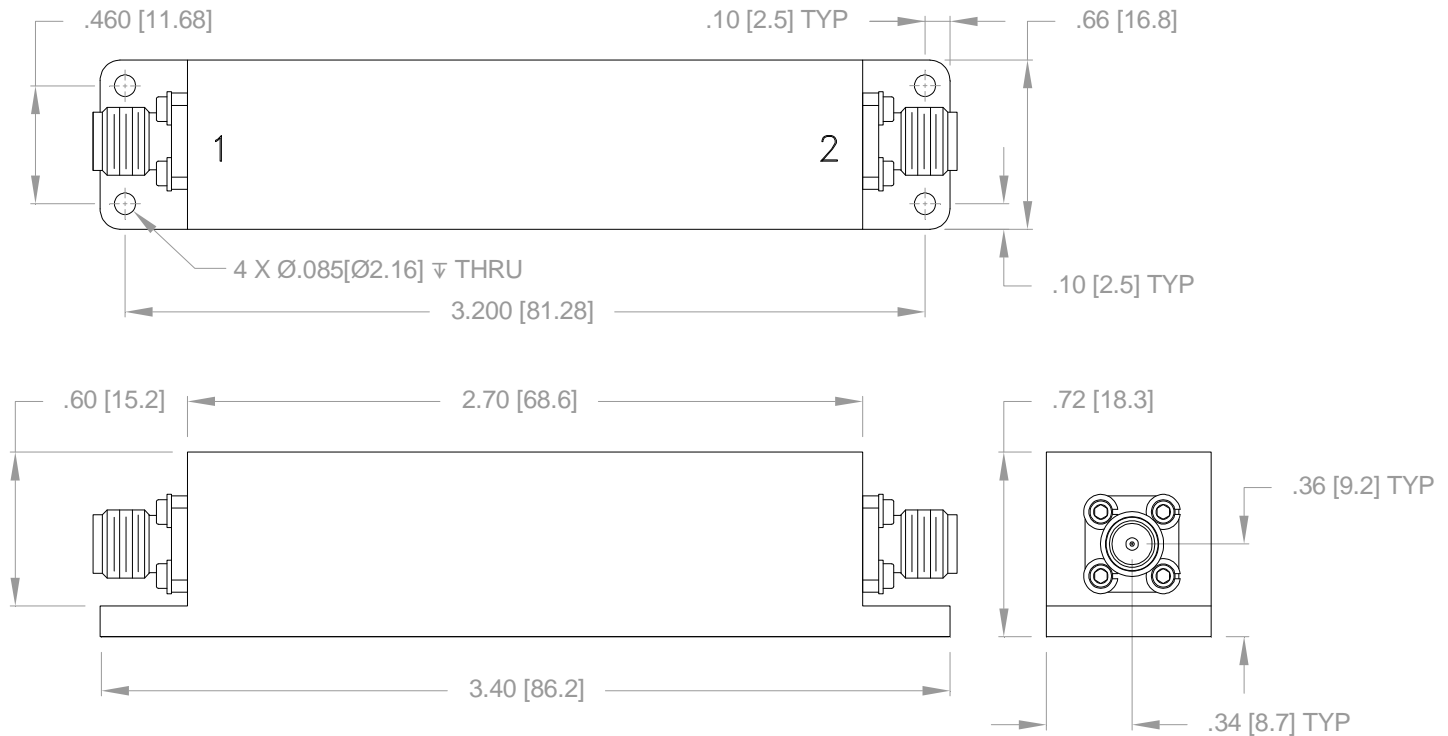
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
13050	2.38	2.27	2.17
13200	1.80	1.76	1.72
13300	1.61	1.58	1.55
13400	1.48	1.46	1.45
13500	1.40	1.38	1.37
13600	1.32	1.30	1.29
13700	1.24	1.24	1.23
13800	1.21	1.20	1.20
13900	1.18	1.18	1.17
14000	1.14	1.13	1.13
14100	1.10	1.10	1.10
14200	1.08	1.08	1.08
14300	1.07	1.07	1.07
14400	1.06	1.05	1.05
14500	1.03	1.02	1.02
14600	1.01	1.01	1.01
14700	1.01	1.01	1.01
14800	1.01	1.01	1.01
14900	1.00	0.99	0.99
15000	0.97	0.97	0.97
15100	0.96	0.96	0.97
15200	0.97	0.97	0.98
15300	0.98	0.98	0.98
15400	0.98	0.98	0.97
15500	0.97	0.96	0.96
15600	0.96	0.96	0.96
16000	0.98	0.98	0.98
16100	0.97	0.98	0.98
16300	1.01	1.02	1.03
16500	1.04	1.03	1.04
16700	1.06	1.07	1.08
16800	1.10	1.11	1.12
16900	1.13	1.13	1.14
17000	1.15	1.15	1.16
17100	1.17	1.19	1.21
17200	1.24	1.25	1.27
17300	1.30	1.31	1.33
17400	1.36	1.38	1.41
17500	1.46	1.50	1.53
17600	1.61	1.64	1.69
17750	1.98	2.08	2.23

## Typical Performance Curves



## Outline Dimensions

AAB3552



Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .100(2.54)$ ; 3 Pl.  $\pm .015(0.381)$

### Notes:

1. Case material: Aluminum.
2. Case Finish: Powder coated.
3. Unit Weight: 62 grams.
4. Refer to the individual model data sheet for the type of connectors available.

**Mini-Circuits®**  
ISO 9001 ISO 14001 CERTIFIED

ALL NEW  
minicircuits.com

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RF/IF MICROWAVE COMPONENTS



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
Humidity	90 to 95% RH, 40°C, 96 hours; Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103, Condition B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°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	50g, 11ms half-sine, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition A