

# Coaxial Bandpass Filter

## SBP-240+

50Ω      238 to 242 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FF99

### The Big Deal

- High rejection
- Good VSWR, 1.3:1 typical in passband
- Narrow Bandwidth
- Flat group delay over passband
- Rugged unibody construction
- Connectorized package

### Product Overview

SBP-240+ is a 50Ω bandpass filter in a connectorized package. This bandpass filter covers from 238 to 242 MHz, these units offer good matching within the passband and high rejection. This unit uses a miniature high Q capacitors and wire welded inductors for high reliability. It has repeatable performance across production lots and consistent performance across temperature.

### Key Features

Feature	Advantages
High rejection	The model has group delay over passband around 48 ns
Good VSWR, 1.3:1 typical in passband	This provides well matched input and output ports.
Flat group delay over passband	The model has flat group delay of over passband which ensures that the signal distortion is very less.
Connectorized package	Connectorized package is easy to interface with other devices and well suited for test setups.

#### 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.  
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Connectors SMA Model SBP-240+

## Features

- High rejection
- Good VSWR, 1.3:1 typical in passband
- Narrow bandwidth
- Flat group delay over passband
- Rugged unibody construction
- Connectorized package

## Applications

- Fixed applications
- Mobile communication

## Electrical Specifications at 25°C

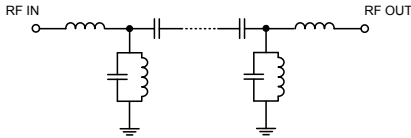
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center frequency	-	-	240	-	MHz
	Insertion Loss	F1-F2	238 - 242	4.1	5.0	dB
	VSWR	F1-F2	238 - 242	1.3	1.8	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 210	40	48	dB
		F3-F4	210 - 220	20	32	dB
Stop Band, Upper	Insertion Loss	F5-F6	260 - 275	20	30	dB
		F6-F7	275 - 2000	40	50	dB

## Maximum Ratings

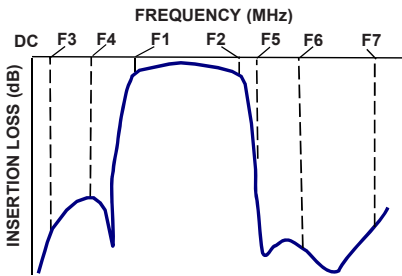
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5 W max.

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

## Functional Schematic



## Typical Frequency Response

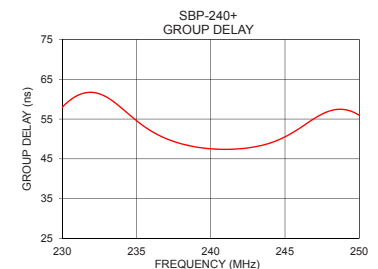
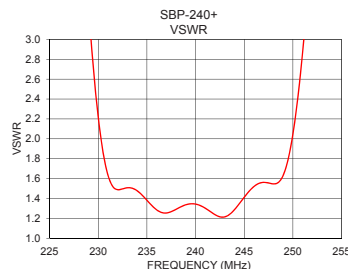
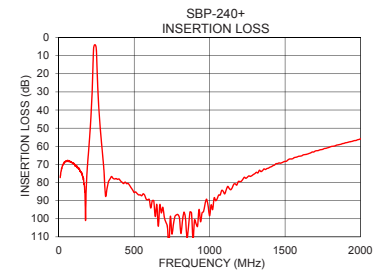
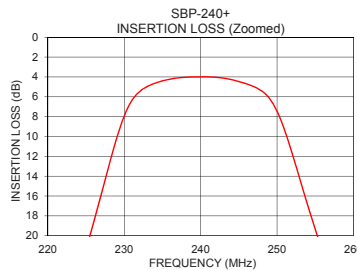


### +RoHS Compliant

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

## Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
10	77.26	63.89	235.5	53.17
50	68.23	47.23	236.0	51.95
100	69.37	67.86	236.5	50.92
210	48.67	70.76	237.0	50.07
220	32.75	30.39	237.5	49.37
225	21.35	12.70	238.0	48.80
238	4.03	1.29	238.5	48.34
239	4.00	1.34	239.0	47.97
240	3.99	1.34	239.5	47.71
241	4.00	1.30	240.0	47.52
242	4.04	1.24	240.5	47.41
256	21.70	10.86	241.0	47.38
260	29.76	18.34	241.5	47.42
275	49.71	45.38	242.0	47.54
300	73.26	82.69	242.5	47.75
400	78.06	171.14	243.0	48.05
500	85.51	217.30	243.5	48.44
1000	98.33	202.26	244.0	48.97
1500	68.32	127.83	244.5	49.66
2000	55.90	85.62	245.0	50.53



### Notes

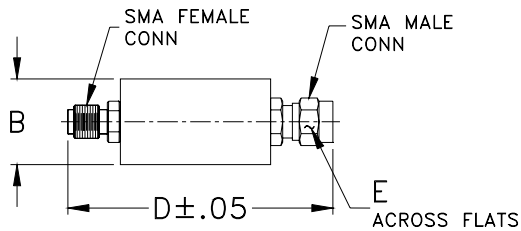
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**Coaxial Connections**

PORT - 1	SMA-Male
PORT - 2	SMA-Female

**Outline Drawing**



**Outline Dimensions (  $\frac{\text{inch}}$  /  $\frac{\text{mm}}$  )**

B	D	E	Wt.
.70	1.98	.312	grams
17.78	50.29	7.92	42.0

*Note: Please refer to case style drawing for details*

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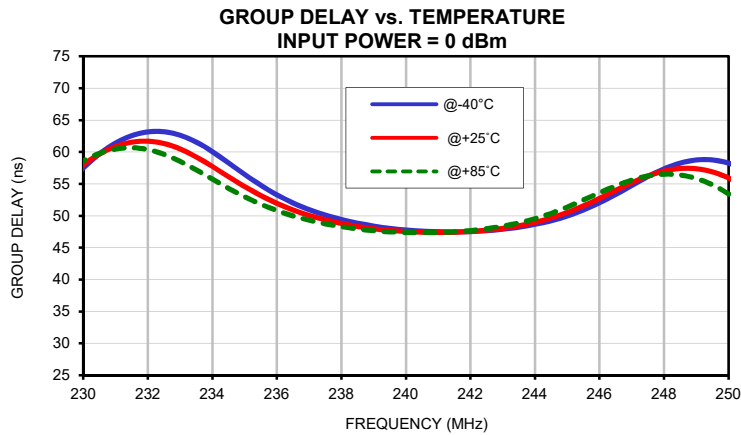
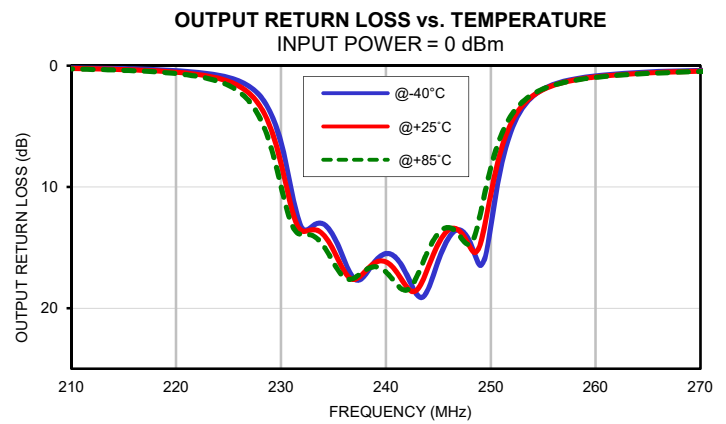
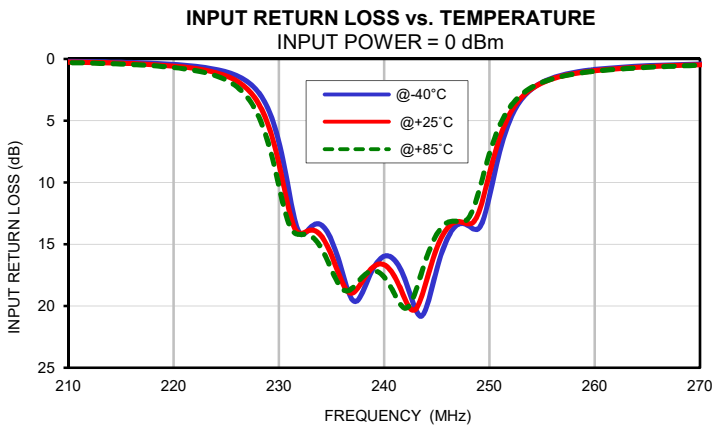
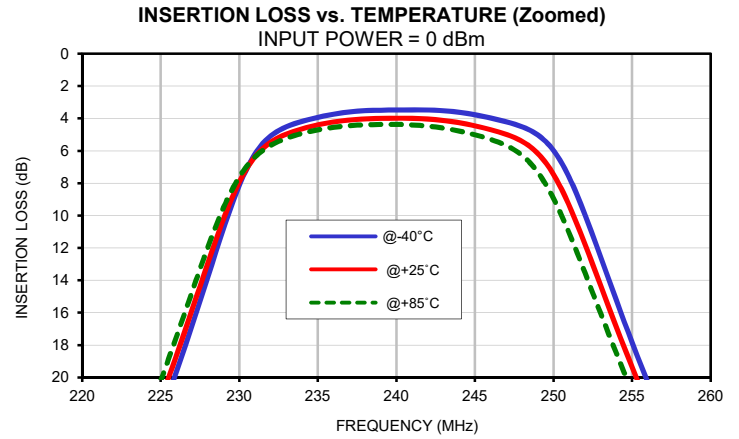
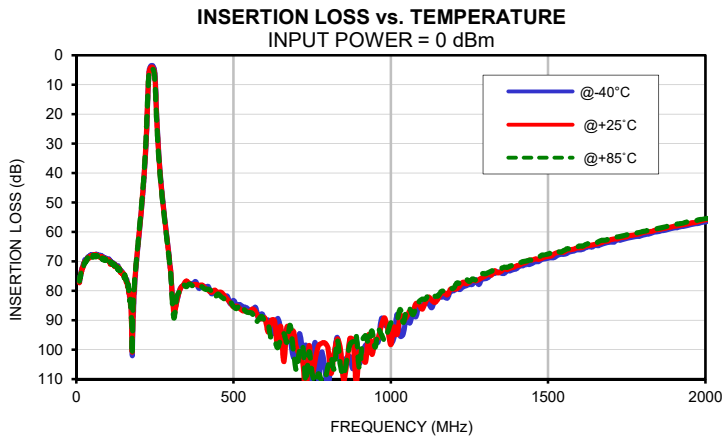
## Typical Performance Data

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
10.0	77.15	77.26	76.74	0.22	0.27	0.31	0.21	0.26	0.30
20.0	71.95	72.42	72.01	0.29	0.33	0.36	0.27	0.31	0.35
25.0	70.51	70.45	70.79	0.31	0.35	0.38	0.29	0.33	0.36
30.0	69.35	69.99	70.17	0.33	0.37	0.40	0.30	0.34	0.37
40.0	68.32	68.80	68.59	0.34	0.38	0.40	0.30	0.34	0.38
50.0	67.81	68.23	68.42	0.33	0.37	0.39	0.30	0.33	0.36
85.0	68.61	68.88	68.96	0.26	0.29	0.31	0.23	0.26	0.28
100.0	69.47	69.37	69.96	0.23	0.26	0.27	0.20	0.23	0.25
110.0	70.13	70.27	70.48	0.21	0.23	0.25	0.19	0.21	0.23
112.0	70.23	70.65	70.55	0.20	0.23	0.25	0.18	0.21	0.23
114.0	70.71	70.89	70.68	0.20	0.23	0.24	0.18	0.21	0.22
115.0	70.38	71.09	70.64	0.20	0.22	0.24	0.18	0.20	0.22
118.0	70.60	71.06	70.84	0.19	0.22	0.23	0.17	0.20	0.22
120.0	71.19	70.93	71.11	0.19	0.21	0.23	0.17	0.20	0.22
124.0	71.31	71.47	72.17	0.18	0.21	0.22	0.16	0.19	0.21
128.0	71.89	71.72	72.36	0.17	0.20	0.22	0.16	0.18	0.20
130.0	71.84	72.28	72.25	0.17	0.20	0.21	0.15	0.18	0.20
132.0	71.73	72.46	72.69	0.17	0.19	0.21	0.15	0.18	0.20
134.0	72.32	72.07	72.91	0.16	0.19	0.21	0.15	0.18	0.19
140.0	73.00	73.31	73.34	0.15	0.18	0.20	0.14	0.17	0.19
142.0	73.45	73.53	73.29	0.15	0.18	0.20	0.14	0.17	0.18
200.0	61.01	60.39	59.93	0.13	0.17	0.20	0.13	0.17	0.20
210.0	49.33	48.67	48.00	0.19	0.25	0.29	0.19	0.24	0.28
215.0	42.25	41.50	40.71	0.26	0.34	0.41	0.26	0.34	0.40
220.0	33.60	32.75	31.79	0.44	0.57	0.69	0.43	0.55	0.66
235.0	3.93	4.40	4.70	14.67	15.89	17.06	14.05	15.22	16.24
238.0	3.52	4.03	4.40	18.79	17.90	17.61	17.29	16.99	16.88
238.5	3.50	4.02	4.38	17.79	17.27	17.28	16.68	16.55	16.66
239.0	3.49	4.00	4.37	16.91	16.82	17.16	16.11	16.24	16.59
239.5	3.48	4.00	4.37	16.30	16.61	17.29	15.69	16.10	16.71
240.0	3.48	3.99	4.37	15.98	16.67	17.67	15.50	16.18	17.01
240.5	3.48	3.99	4.38	15.98	17.01	18.28	15.56	16.48	17.47
241.0	3.47	4.00	4.40	16.29	17.63	19.06	15.88	16.99	18.00
241.5	3.48	4.02	4.43	16.93	18.50	19.82	16.46	17.63	18.42
242.0	3.48	4.04	4.47	17.90	19.48	20.19	17.26	18.26	18.50
250.0	5.99	7.46	8.96	11.14	9.29	7.68	13.24	10.58	8.45
256.0	20.30	21.70	23.09	1.53	1.60	1.60	1.56	1.63	1.62
260.0	28.73	29.76	30.82	0.86	0.95	0.99	0.85	0.94	0.98
261.0	30.53	31.50	32.50	0.77	0.86	0.90	0.76	0.85	0.89
275.0	49.18	49.71	50.28	0.32	0.38	0.42	0.31	0.37	0.40
300.0	73.56	73.26	74.06	0.16	0.21	0.24	0.16	0.20	0.23
400.0	78.29	78.06	78.69	0.06	0.10	0.13	0.07	0.10	0.12
500.0	83.28	85.51	85.39	0.04	0.08	0.11	0.05	0.08	0.10
600.0	89.88	89.32	90.67	0.02	0.08	0.11	0.03	0.07	0.09
700.0	100.18	99.21	107.05	0.02	0.07	0.11	0.03	0.07	0.09
800.0	113.25	99.40	105.88	0.01	0.08	0.12	0.03	0.08	0.10
1000.0	97.80	98.33	90.95	0.01	0.09	0.14	0.03	0.09	0.11
1050.0	88.60	88.96	86.10	0.02	0.09	0.14	0.03	0.09	0.12
1100.0	85.70	86.26	82.85	0.02	0.10	0.15	0.03	0.10	0.13
1150.0	81.64	82.83	81.80	0.02	0.10	0.16	0.03	0.10	0.13
1200.0	80.02	79.47	79.10	0.02	0.10	0.16	0.04	0.10	0.14
1250.0	77.86	77.10	76.88	0.03	0.11	0.17	0.04	0.11	0.15
1300.0	75.95	75.07	74.25	0.03	0.11	0.17	0.04	0.11	0.15
1350.0	74.01	73.50	72.49	0.03	0.12	0.18	0.05	0.12	0.16
1400.0	72.51	71.53	70.56	0.04	0.12	0.18	0.05	0.13	0.17
1500.0	68.91	68.32	67.51	0.05	0.14	0.20	0.05	0.13	0.18
1600.0	66.13	65.44	64.78	0.05	0.15	0.21	0.07	0.15	0.20
1700.0	63.45	62.62	62.19	0.07	0.16	0.23	0.08	0.17	0.21
1800.0	61.20	60.31	59.91	0.08	0.18	0.25	0.09	0.18	0.23
2000.0	56.63	55.90	55.52	0.10	0.20	0.28	0.11	0.22	0.27

## Typical Performance Data

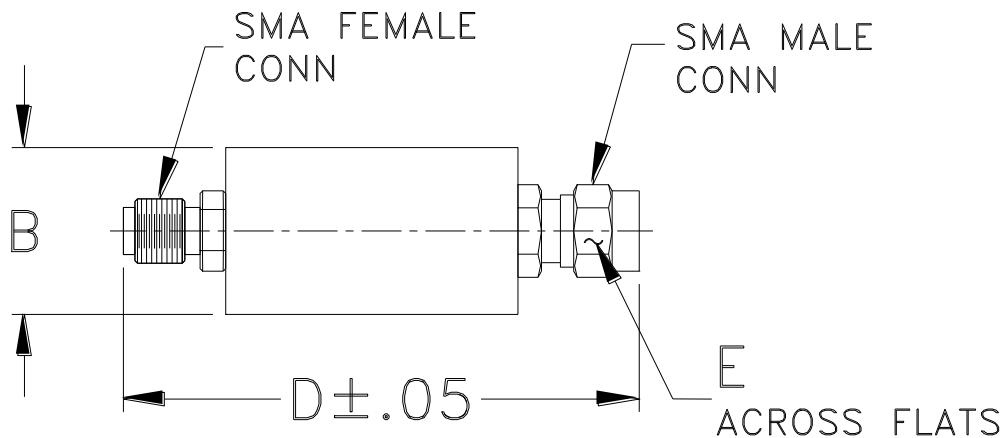
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
230.0	57.51	57.99	58.62
230.5	59.73	59.69	59.79
231.0	61.42	60.88	60.48
231.5	62.56	61.56	60.68
232.0	63.16	61.71	60.39
232.5	63.19	61.34	59.64
233.0	62.64	60.48	58.55
233.5	61.56	59.23	57.20
234.0	60.07	57.73	55.75
234.5	58.31	56.14	54.31
235.0	56.51	54.58	52.99
235.5	54.80	53.17	51.82
236.0	53.30	51.95	50.82
236.5	52.02	50.92	49.99
237.0	50.98	50.07	49.31
237.5	50.12	49.37	48.74
238.0	49.43	48.80	48.30
238.5	48.86	48.34	47.94
239.0	48.40	47.97	47.67
239.5	48.03	47.71	47.49
240.0	47.77	47.52	47.38
240.5	47.58	47.41	47.35
241.0	47.48	47.38	47.38
241.5	47.46	47.42	47.50
242.0	47.53	47.54	47.69
242.5	47.66	47.75	47.98
243.0	47.90	48.05	48.37
243.5	48.22	48.44	48.89
244.0	48.66	48.97	49.56
244.5	49.23	49.66	50.38
245.0	49.98	50.53	51.37
245.5	50.91	51.56	52.47
246.0	52.03	52.73	53.60
246.5	53.35	53.98	54.69
247.0	54.76	55.20	55.60
247.5	56.15	56.26	56.25
248.0	57.37	57.02	56.53
248.5	58.27	57.43	56.41
249.0	58.76	57.38	55.85
249.5	58.76	56.89	54.86
250.0	58.28	55.94	53.43

## Typical Performance Curves



## Outline Dimensions

**FF56**  
**FF99**



CASE #.	A	B	C	D	E	WT GRAMS
FF56	--	.46 (11.68)	--	1.70 (43.18)	.312 (7.92)	18.0
FF99	--	.70 (17.78)	--	1.98 (50.29)		42.0

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

### Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.



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	-40° to 85° 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, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C