

# Coaxial Bandpass Filter

## SBP-101+

50Ω 94 to 108 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FF99

### The Big Deal

- Flat group delay over passband
- Narrow bandwidth
- Good VSWR (1.2:1 typical)
- Fast roll-off
- High rejection

### Product Overview

SBP-101+ is a 50Ω bandpass filter in a connectorized package. The bandpass filter covers from 94 to 108 MHz, and offers good matching within the passband with high out of band rejection. The filter uses 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
Flat group delay over passband	The model has group delay over passband around 45 ns
Good VSWR, 1.2:1 typical over passband	This provides well matched input and output ports.
High rejection	This enables the filter to attenuate spurious signals and reject harmonics for broad frequency band.
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.  
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](http://www.minicircuits.com/MCLStore/terms.jsp)



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Connectors SMA Model SBP-101+

## Features

- Flat group delay over passband
- Good VSWR, 1.2:1 typical in passband
- High rejection, 60 dB typ
- Rugged shielded case
- Connectorized package
- Fast roll-off

## Applications

- Test equipment
- Harmonic rejection
- Transmitters / Receivers
- Military

## Electrical Specifications at 25°C

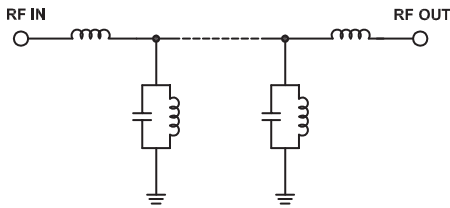
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Center frequency	-	-	101	-	MHz	
	Insertion Loss	F1-F2	94 - 108	-	2.3	3.5	dB
	VSWR	F1-F2	94 - 108	-	1.2	1.6	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 50	50	65	-	dB
	VSWR	F3-F4	50 - 80	20	29	-	dB
		DC-F4	DC - 80	-	20	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	130 - 200	20	28	-	dB
		F6-F7	200 - 680	50	60	-	dB
	VSWR	F7-F8	680 - 2000	-	40	-	dB
		F8-F9	2000 - 3300	-	30	-	dB
		F5-F9	130 - 3300	-	20	-	:1

## Maximum Ratings

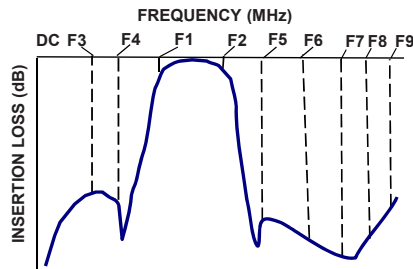
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.25 W max.

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

## Functional Schematic



## Typical Frequency Response

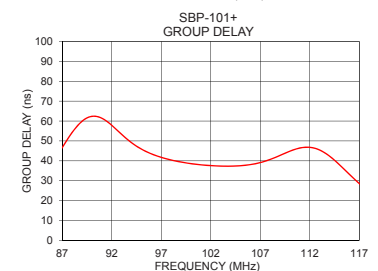
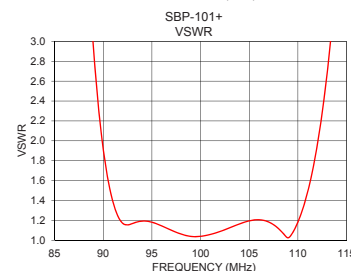
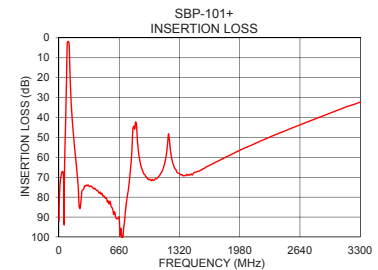
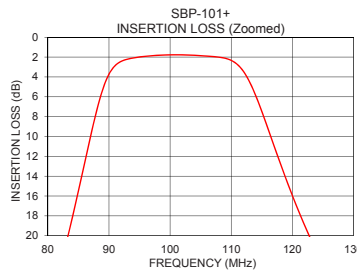


## Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1	92.02	172.45	94.0	49.09
10	75.11	73.77	94.5	47.36
30	67.68	52.02	95.0	45.87
50	69.79	49.32	95.5	44.60
79	30.15	34.97	96.0	43.50
80	27.94	32.13	96.5	42.56
83	20.79	21.57	97.0	41.75
90	3.72	1.91	97.5	41.03
94	2.08	1.19	98.0	40.41
101	1.77	1.06	98.5	39.86
108	2.01	1.12	99.0	39.38
123	20.34	17.31	99.5	38.95
130	28.55	25.50	100.0	38.58
132	30.50	27.51	100.5	38.26
145	40.67	38.61	101.0	38.00
200	68.68	72.62	101.5	37.77
680	95.68	210.10	102.0	37.59
1000	71.29	177.70	106.0	38.10
2000	56.00	83.90	107.0	39.12
3300	32.25	36.96	108.0	40.70

### +RoHS Compliant

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



### Notes

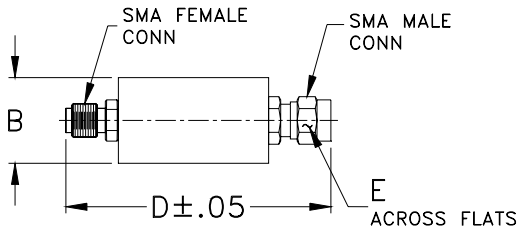
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**Coaxial Connections**

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*

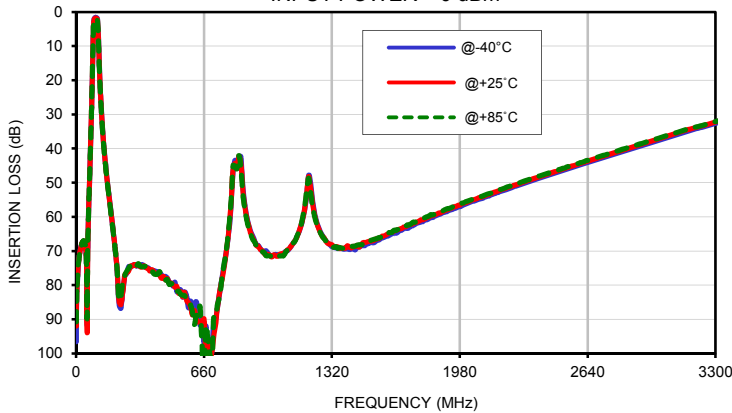
FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	96.55	92.02	90.78	0.05	0.10	0.14	0.06	0.11	0.15
5	79.68	81.54	81.33	0.15	0.20	0.24	0.14	0.19	0.23
10	75.92	75.11	74.31	0.19	0.24	0.27	0.18	0.22	0.26
20	70.39	70.04	69.93	0.26	0.29	0.33	0.26	0.31	0.34
30	67.73	67.68	68.10	0.30	0.33	0.36	0.30	0.34	0.37
40	67.27	67.34	67.29	0.32	0.36	0.39	0.31	0.35	0.38
42	67.54	67.14	67.34	0.32	0.36	0.39	0.31	0.35	0.38
50	69.58	69.79	69.85	0.32	0.35	0.38	0.30	0.34	0.36
60	69.98	69.70	69.34	0.31	0.34	0.37	0.29	0.33	0.35
79	30.42	30.15	29.88	0.43	0.50	0.55	0.42	0.49	0.55
80	28.23	27.94	27.66	0.46	0.54	0.60	0.46	0.54	0.60
83	21.12	20.79	20.45	0.68	0.81	0.91	0.68	0.80	0.90
90	3.60	3.72	3.77	9.04	10.07	11.12	9.09	10.15	11.30
94	1.86	2.08	2.25	20.38	21.11	21.56	20.47	20.99	21.23
95	1.77	1.99	2.15	20.46	21.59	22.53	19.90	20.73	21.31
96	1.70	1.92	2.08	21.91	23.40	24.83	20.52	21.48	22.26
97	1.65	1.86	2.02	24.45	26.36	28.46	21.71	22.69	23.52
100	1.57	1.78	1.94	33.05	34.21	36.50	25.09	25.93	27.00
101	1.56	1.77	1.93	31.06	30.91	31.63	25.74	26.51	27.68
108	1.75	2.01	2.21	24.95	25.06	25.79	22.68	22.36	22.34
120	15.38	15.95	16.43	1.28	1.35	1.39	1.21	1.30	1.35
123	19.85	20.34	20.77	0.94	1.00	1.05	0.89	0.97	1.02
130	28.18	28.55	28.88	0.63	0.68	0.72	0.59	0.66	0.70
132	30.16	30.50	30.81	0.58	0.63	0.67	0.55	0.61	0.65
140	36.90	37.18	37.42	0.46	0.50	0.53	0.43	0.49	0.52
150	43.61	43.82	44.02	0.37	0.41	0.44	0.35	0.40	0.43
200	68.59	68.68	68.78	0.20	0.24	0.26	0.19	0.23	0.25
201	69.11	69.19	69.29	0.20	0.24	0.26	0.19	0.23	0.25
221	85.41	84.55	84.38	0.17	0.20	0.23	0.16	0.20	0.22
331	74.48	74.66	74.46	0.08	0.12	0.14	0.08	0.12	0.13
431	76.37	77.21	76.08	0.06	0.10	0.12	0.05	0.09	0.10
520	81.97	80.42	81.85	0.04	0.09	0.11	0.04	0.08	0.09
600	85.77	88.70	87.74	0.03	0.08	0.11	0.03	0.08	0.09
680	98.26	95.68	95.68	0.02	0.08	0.12	0.03	0.07	0.09
800	56.37	55.81	54.84	0.02	0.10	0.14	0.04	0.09	0.11
900	64.13	64.63	64.69	0.02	0.10	0.14	0.02	0.08	0.10
1000	71.32	71.29	71.45	0.02	0.10	0.15	0.02	0.08	0.10
1100	69.38	69.29	69.34	0.02	0.10	0.16	0.03	0.09	0.11
1200	47.86	48.21	48.65	0.06	0.15	0.20	0.06	0.13	0.15
1300	67.73	67.83	67.51	0.04	0.13	0.19	0.04	0.10	0.13
1400	69.36	68.48	69.06	0.04	0.13	0.20	0.05	0.12	0.14
1500	67.88	67.40	67.28	0.05	0.15	0.21	0.05	0.12	0.15
1600	65.67	65.27	65.03	0.06	0.16	0.23	0.06	0.14	0.17
1700	63.34	62.92	62.83	0.07	0.17	0.24	0.06	0.14	0.18
1800	60.94	60.58	60.24	0.07	0.18	0.25	0.08	0.16	0.20
1900	58.69	58.24	57.98	0.08	0.19	0.26	0.09	0.17	0.21
2000	56.51	56.00	55.89	0.08	0.21	0.28	0.10	0.19	0.23
2100	54.50	54.08	53.84	0.09	0.22	0.30	0.12	0.21	0.25
2200	52.40	51.94	51.78	0.09	0.23	0.32	0.12	0.22	0.27
2300	50.39	50.04	49.78	0.10	0.25	0.35	0.13	0.24	0.28
2400	48.47	48.13	47.86	0.11	0.26	0.37	0.14	0.26	0.31
2500	46.63	46.26	46.05	0.12	0.28	0.39	0.15	0.28	0.32
2600	44.80	44.42	44.16	0.13	0.30	0.42	0.17	0.30	0.35
2700	43.01	42.60	42.37	0.14	0.32	0.43	0.18	0.32	0.37
2800	41.26	40.81	40.60	0.15	0.34	0.46	0.18	0.33	0.40
2900	39.48	39.03	38.83	0.17	0.36	0.48	0.20	0.36	0.42
3000	37.71	37.26	37.07	0.18	0.38	0.50	0.22	0.38	0.45
3100	35.92	35.49	35.30	0.20	0.41	0.53	0.24	0.41	0.49
3200	34.20	33.81	33.66	0.23	0.45	0.57	0.27	0.45	0.53
3300	32.63	32.25	32.08	0.25	0.47	0.60	0.29	0.46	0.56

## Typical Performance Data

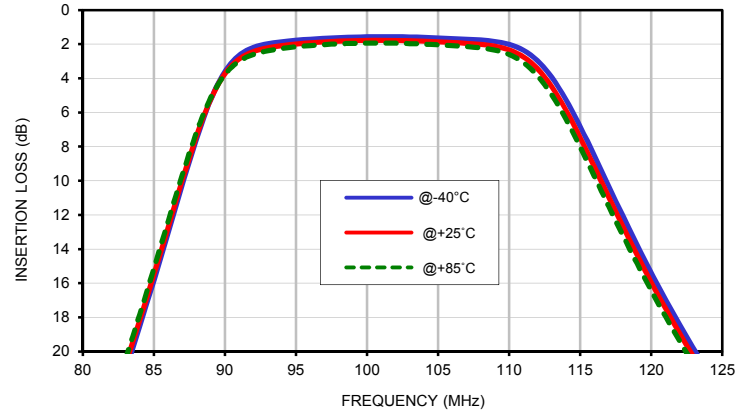
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
90.0	62.98	62.38	61.98
90.5	63.21	62.29	61.58
91.0	62.55	61.40	60.48
91.5	61.15	59.86	58.80
92.0	59.16	57.85	56.74
92.5	56.82	55.58	54.52
93.0	54.38	53.28	52.32
93.5	52.02	51.09	50.25
94.0	49.86	49.09	48.40
94.5	47.97	47.36	46.80
95.0	46.36	45.87	45.40
95.5	44.98	44.60	44.21
96.0	43.82	43.50	43.18
96.5	42.82	42.56	42.30
97.0	41.97	41.75	41.52
97.5	41.22	41.03	40.84
98.0	40.57	40.41	40.25
98.5	40.00	39.86	39.72
99.0	39.49	39.38	39.26
99.5	39.04	38.95	38.85
100.0	38.65	38.58	38.50
100.5	38.32	38.26	38.21
101.0	38.03	38.00	37.96
101.5	37.80	37.77	37.76
102.0	37.60	37.59	37.59
102.5	37.46	37.46	37.48
103.0	37.34	37.36	37.40
103.5	37.28	37.31	37.37
104.0	37.28	37.33	37.41
104.5	37.33	37.40	37.50
105.0	37.44	37.54	37.66
105.5	37.63	37.77	37.92
106.0	37.92	38.10	38.29
106.5	38.33	38.54	38.78
107.0	38.86	39.12	39.40
107.5	39.53	39.85	40.17
108.0	40.34	40.70	41.05
108.5	41.28	41.67	42.04
109.0	42.33	42.73	43.09
109.5	43.45	43.81	44.14
110.0	44.56	44.86	45.11

## Typical Performance Curves

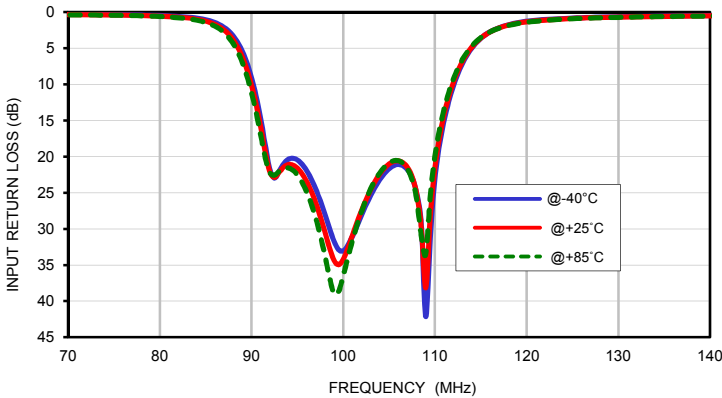
**INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



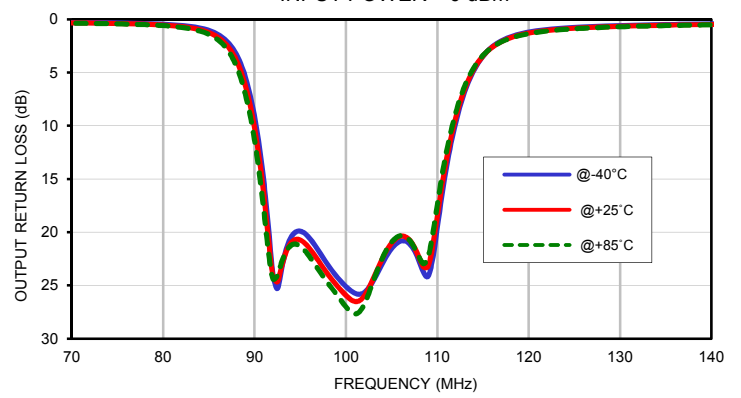
**INSERTION LOSS vs. TEMPERATURE (Zoomed)**  
INPUT POWER = 0 dBm



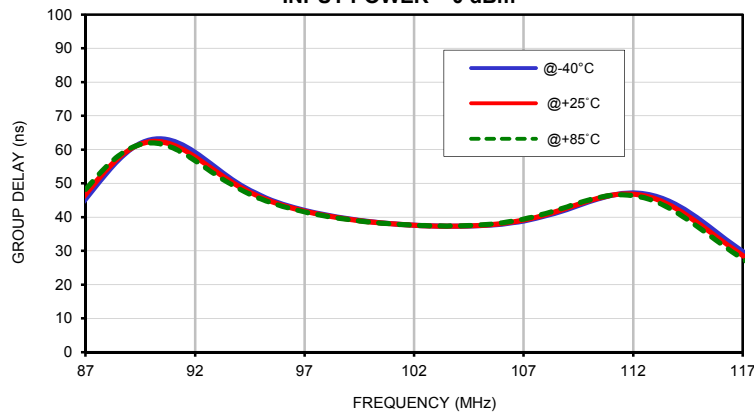
**INPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**OUTPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm

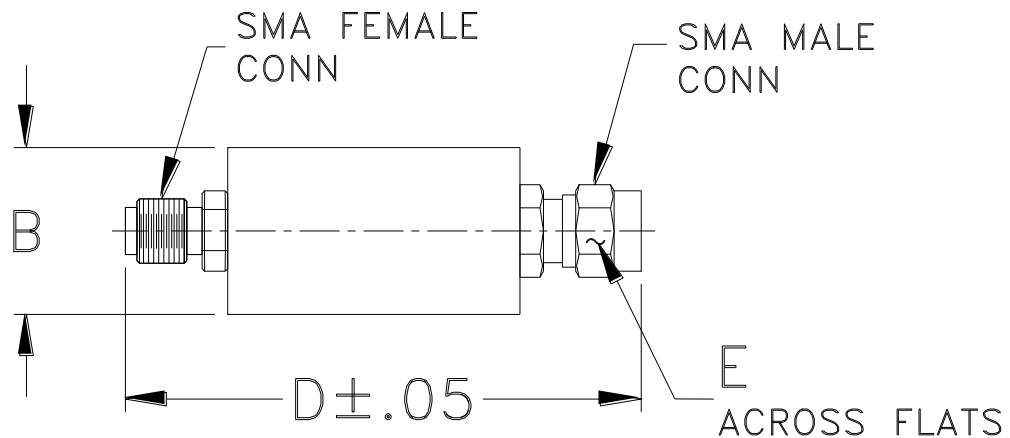


**GROUP DELAY vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**FF56**  
**FF99**

## Outline Dimensions



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