

# Cavity Bandpass Filters

## ZVBP Model Series

50Ω 24.25 to 43.5 GHz

### The Big Deal

- Very low insertion loss with excellent power handling
- Sharp roll-off with wide stopband
- Passbands from 24.25 to 43.5 GHz covering 5G bands\*.
- Stopbands up to 57 GHz



### Product Overview

Mini-Circuits' cavity filters are designed by implementing resonant structures with very high Q and are ideal for narrow-band, high-selectivity applications. These designs can provide bandwidths as narrow as 3% with very high selectivity and excellent low noise floor. Low insertion loss combined with excellent power handling makes them well-suited for transmitter and receiver front end. Advanced filter design and construction enables stopband width greater than 3x the center frequency.

### Key Features

Feature	Advantages
5G bands	Use in various 5G applications, covering n257, n258, n259, n260, and n261 bands.
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitter
Sharp roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide spur free band results in better receiver sensitivity
High power handling	Well suited for transmitter application
Protective assembly	Prevents accidental de-tuning of precisely tuned resonant circuit

\*High frequency models operating above 40 GHz are available with 2.4mm connectors.

# Cavity Bandpass Filter

## ZVBP-28000-K+

50Ω 26500 to 29500 MHz



Generic photo used for illustration purposes only

CASE STYLE: UH3128

Connectors	Model
2.92mm-F	ZVBP-28000-K+

### Features

- Low insertion loss, 0.5 dB typical
- Good return loss, 20 dB typical
- High rejection
- Broad stopband performance up to 31 GHz
- Sharp roll-off

### Applications

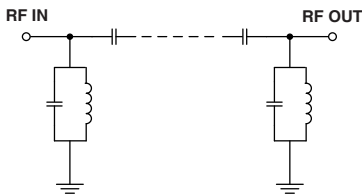
- 5G band n257

### Electrical Specifications<sup>1</sup> at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
<b>Pass Band</b>	Center Frequency	-	-	28000	-	MHz
	Insertion Loss	F1-F2	26500 - 29500	-	0.5	dB
	Return Loss	F1-F2	26500 - 29500	15	27	dB
<b>Stop Band, Lower</b>	Insertion Loss	DC-F3	DC - 25000	30	126	dB
	Return Loss	DC-F3	DC - 25000	-	0.16	dB
<b>Stop Band, Upper</b>	Insertion Loss	F4-F5	31000 - 48000	30	103	dB
	Return Loss	F4-F5	31000 - 48000	-	0.23	dB

1.Data measured after calibrating using 2.92mm cal kit.

### Simplified Functional Schematic



### Maximum Ratings

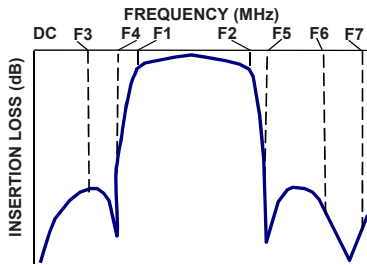
Operating Temperature	-30°C to 70°C
Storage Temperature	-30°C to 70°C
RF Power Input	2.5 W

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

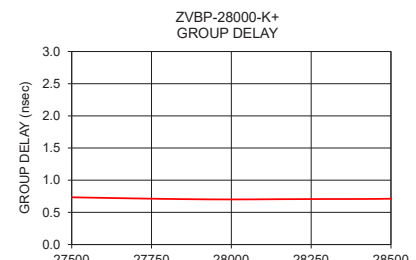
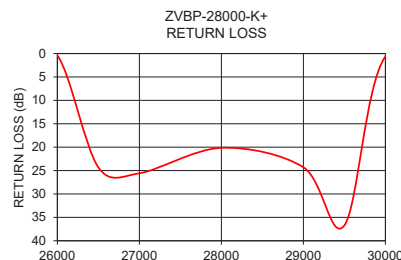
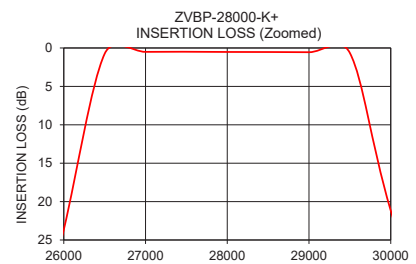
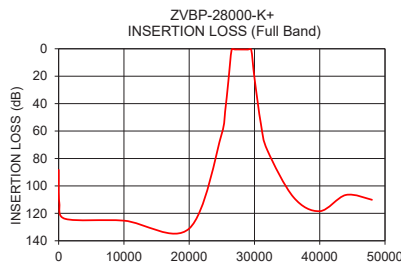
### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	Group Delay (nsec)
10	88.31	0.01	26500	1.24
100	112.16	0.02	26800	0.91
1000	123.99	0.08	26950	0.85
10000	125.32	0.17	27100	0.80
20000	131.08	0.26	27250	0.77
25000	61.74	0.27	27400	0.74
25500	46.01	0.29	27550	0.73
26000	23.66	0.39	27700	0.72
26500	0.75	24.31	27850	0.71
27000	0.51	25.59	28000	0.70
28000	0.52	20.15	28150	0.70
29000	0.55	24.30	28300	0.71
29500	0.65	36.71	28450	0.71
30000	21.18	0.63	28600	0.72
31000	55.17	0.41	28750	0.75
32000	74.25	0.24	28900	0.77
36000	108.36	0.07	29050	0.80
40000	118.41	0.21	29200	0.86
44000	106.59	0.03	29350	0.96
48000	110.11	0.01	29500	1.27

### Typical Frequency Response



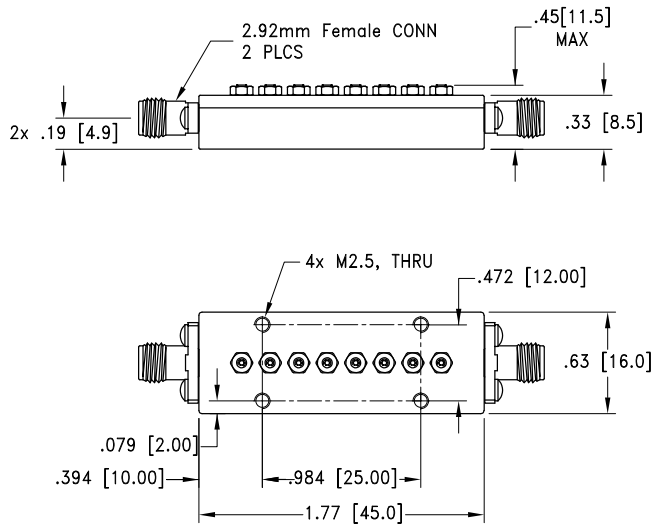
**+RoHS Compliant**  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



## Coaxial Connections

PORT 1	2.92mm-FEMALE
PORT 2	2.92mm-FEMALE

## Outline Drawing



Weight: 75 grams  $\pm$  5 grams;

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

## Additional Notes

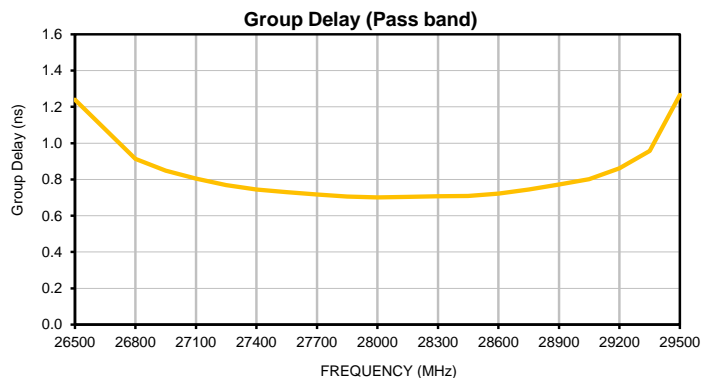
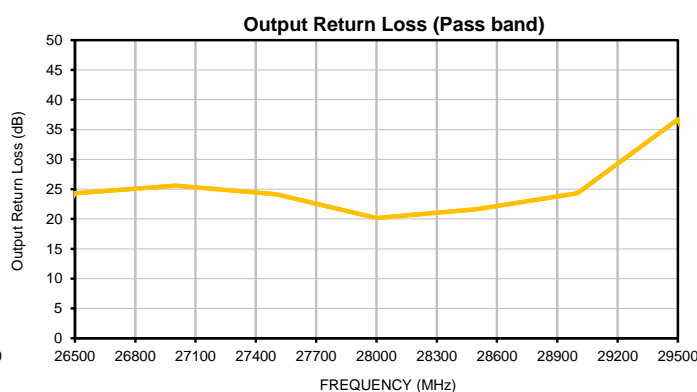
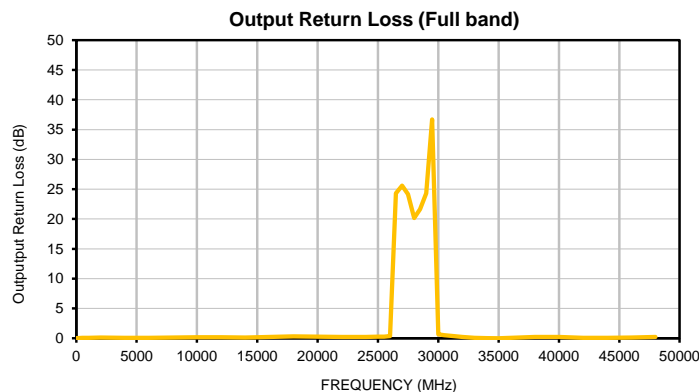
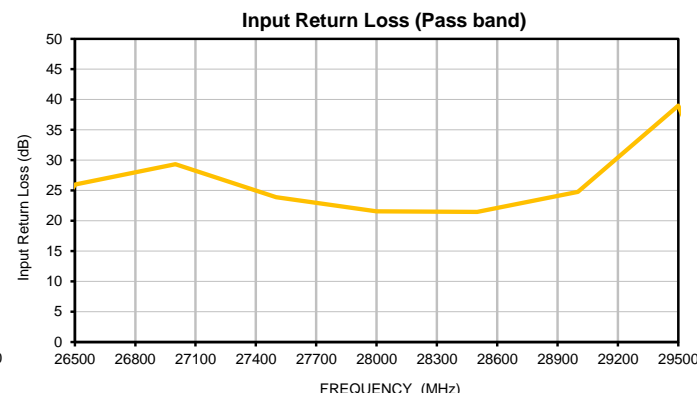
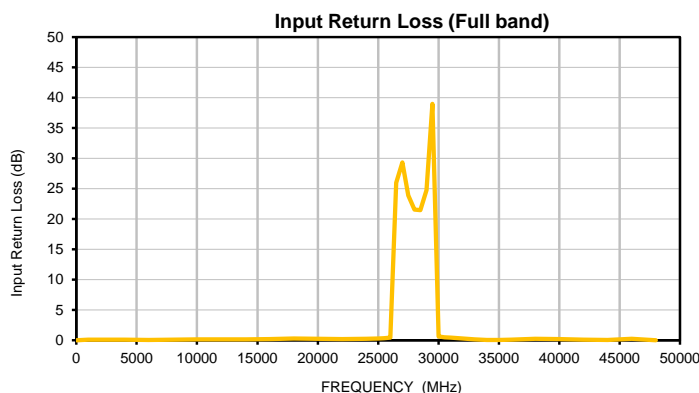
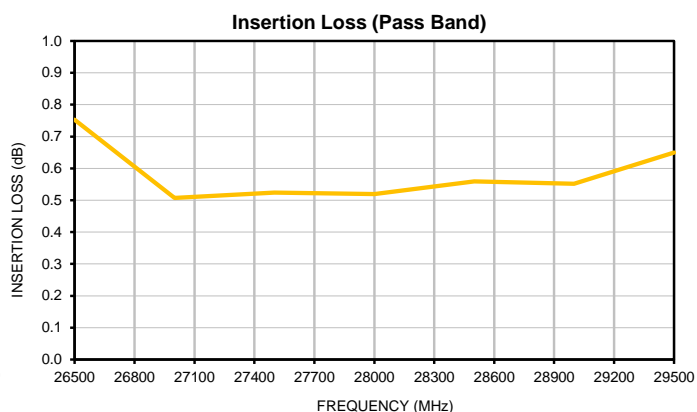
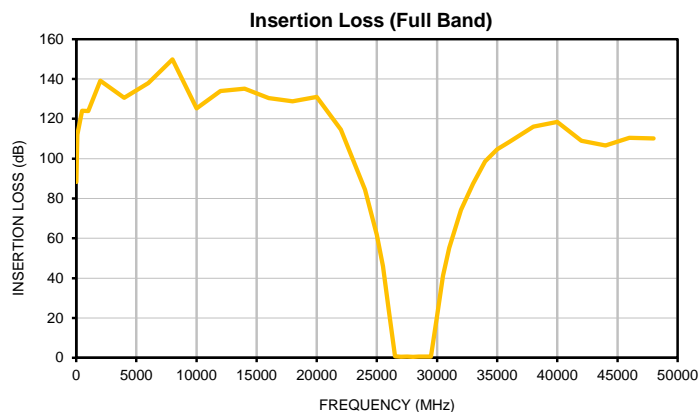
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## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	OUTPUT RETURN LOSS (dB)	FREQUENCY (MHz)	Group Delay (ns)
10	88.31	0.01	0.01	26500	1.24
100	112.16	0.02	0.02	26800	0.91
500	124.11	0.05	0.05	26950	0.85
1000	123.99	0.08	0.08	27100	0.80
2000	139.14	0.10	0.11	27250	0.77
4000	130.57	0.08	0.08	27400	0.74
6000	137.99	0.06	0.06	27550	0.73
8000	149.86	0.12	0.12	27700	0.72
10000	125.32	0.17	0.17	27850	0.71
12000	134.01	0.16	0.15	28000	0.70
14000	135.17	0.14	0.14	28150	0.70
16000	130.47	0.21	0.22	28300	0.71
18000	128.83	0.29	0.31	28450	0.71
20000	131.08	0.26	0.28	28600	0.72
22000	114.59	0.17	0.20	28750	0.75
24000	84.43	0.23	0.22	28900	0.77
25000	61.74	0.29	0.27	29050	0.80
25500	46.01	0.33	0.29	29200	0.86
26000	23.66	0.43	0.39	29350	0.96
26500	0.75	25.97	24.31	29500	1.27
27000	0.51	29.33	25.59		
27500	0.52	23.87	24.17		
28000	0.52	21.55	20.15		
28500	0.56	21.46	21.66		
29000	0.55	24.76	24.30		
29500	0.65	38.99	36.71		
30000	21.18	0.63	0.67		
30500	41.33	0.50	0.51		
31000	55.17	0.42	0.41		
32000	74.25	0.27	0.24		
33000	87.37	0.13	0.08		
34000	98.69	0.05	0.01		
35000	104.73	0.05	0.00		
36000	108.36	0.12	0.07		
38000	116.03	0.24	0.22		
40000	118.41	0.21	0.23		
42000	108.97	0.07	0.08		
44000	106.59	0.03	0.06		
46000	110.44	0.23	0.13		
48000	110.11	0.01	0.22		



## Typical Performance Curves

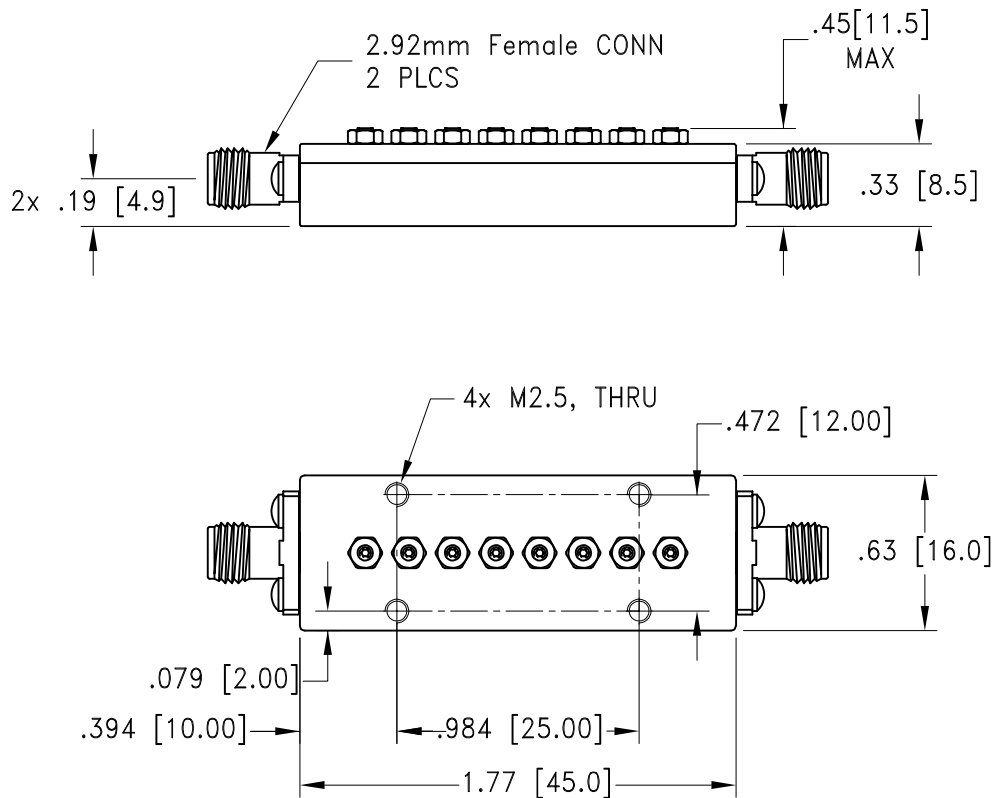


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IF/RF MICROWAVE COMPONENTS



Weight: 75 grams  $\pm$  5 grams;

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

### Notes:

1. Case material: H62 Copper Alloy
2. Case Finish: Black Painting

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RF/IF MICROWAVE COMPONENTS



## Environmental Specifications ENV77T1

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	-30° to 70°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-30° to 70° 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