

# Cavity Bandpass Filters

50Ω DC to 50 GHz



## The Big Deal

- Very low insertion loss with excellent power handling
- Very fast roll-off with wide stopband
- Passbands up to 36 GHz
- Stopbands up to 50 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 1% 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.

Mini-Circuits' 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. Excellent repeatability across units is achieved through precise tuning and process control.

## Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitter
Fast 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

### 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)



# Bandpass Filter

## ZVBP-K34R5G+

50Ω 33000 to 36000 MHz



Generic photo used for illustration purposes only

CASE STYLE: WL3322  
Connectors Model  
2.92mm - F ZVBP-K34R5G+

### Features

- Low Insertion loss, 2dB typ.
- High Rejection, 70dB typ.
- Sharp roll-off
- Good VSWR 1.3:1 typ.
- Wide Stopband performance upto 50 GHz

### Applications

- Radar
- Fixed satellite applications

### Electrical Specifications at 25°C

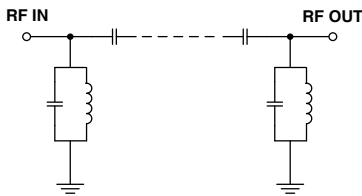
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Center Frequency	-	-	34500	-	MHz	
	Insertion Loss	F1-F2	33000 - 36000	-	2.0	2.5	dB
	VSWR	F1-F2	33000 - 36000	-	1.3	1.7	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 32000	65	73	-	dB
		F3-F4	32000 - 32400	55	61	-	dB
Stop Band, Upper	Insertion Loss	F5-F6	36400 - 37000	30	36	-	dB
		F6-F7	37000 - 43500	65	70	-	dB
		F7-F8	43500 - 50000	-	70	-	dB

### Maximum Ratings

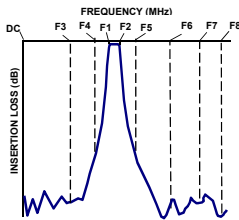
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	5W max. @ 25°C

Permanent damage may occur if any of these limits are exceeded.  
Input and output ports are DC short to ground.

### Functional Schematic



### Typical Frequency Response

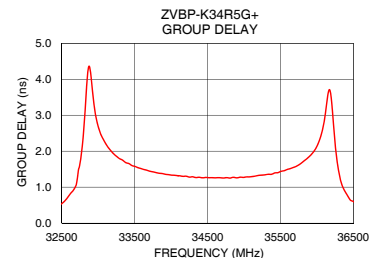
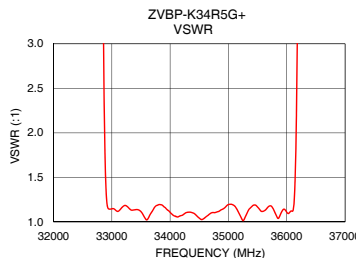
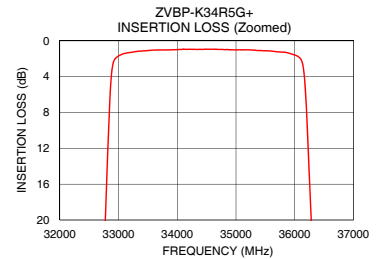
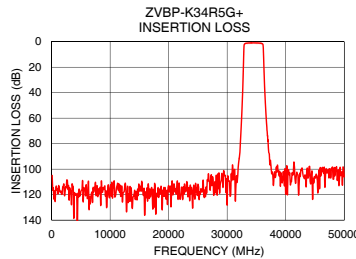


### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
100	104.96	475.69	33000	2.70
1000	115.73	139.21	33150	2.08
10000	115.03	128.40	33300	1.79
32000	93.79	73.98	33450	1.62
32400	66.41	63.20	33600	1.51
32715	29.92	23.17	33750	1.43
32775	19.92	14.17	33900	1.37
32890	3.13	1.58	34050	1.33
33000	1.68	1.15	34200	1.31
34000	0.97	1.11	34350	1.27
34500	0.93	1.04	34500	1.27
35000	1.00	1.20	34650	1.26
36000	1.58	1.11	34800	1.25
36150	3.17	1.64	34950	1.28
36280	19.83	15.04	35100	1.29
36400	35.18	23.36	35250	1.33
37000	79.39	36.18	35400	1.38
40000	119.54	24.60	35550	1.46
43500	113.82	22.83	35700	1.57
50000	106.08	4.34	36000	2.14

### +RoHS Compliant

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



### Notes

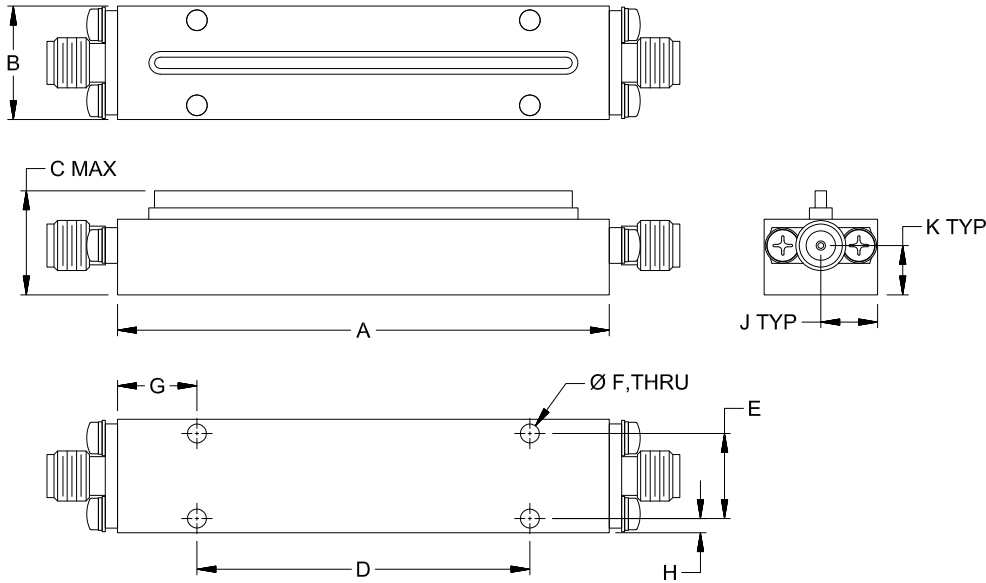
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## Coaxial Connections

PORT-1	2.92mm (K) FEMALE
PORT-2	2.92mm (K) FEMALE

## Outline Drawing



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

A	B	C	D	E	F
2.60	.60	.60	1.760	.450	.100
60.0	15.2	15.2	44.70	11.43	2.54
G	H	J	K		Wt.
.42	.08	.30	.26		grams
10.7	1.9	7.6	6.6		78

Note: Please refer to case style drawing for details

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# Cavity Bandpass Filter

# ZVBP-K34R5G+

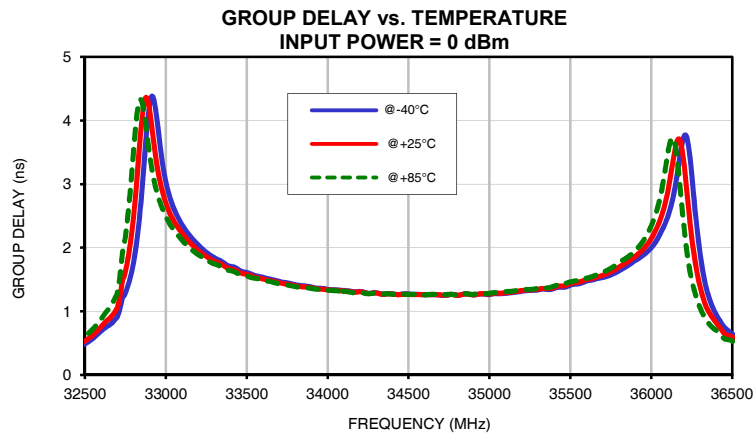
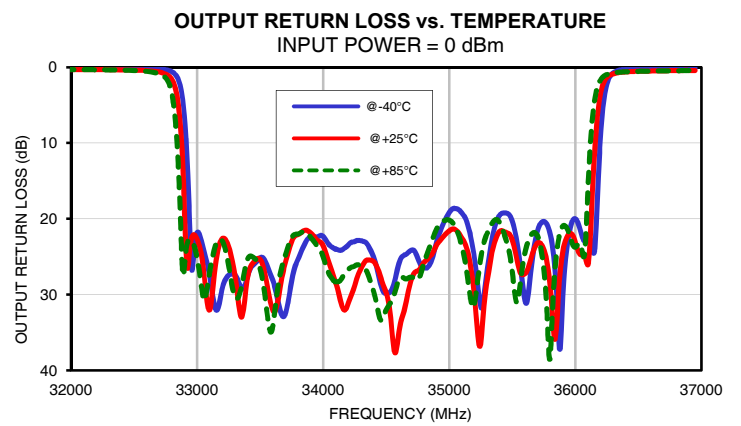
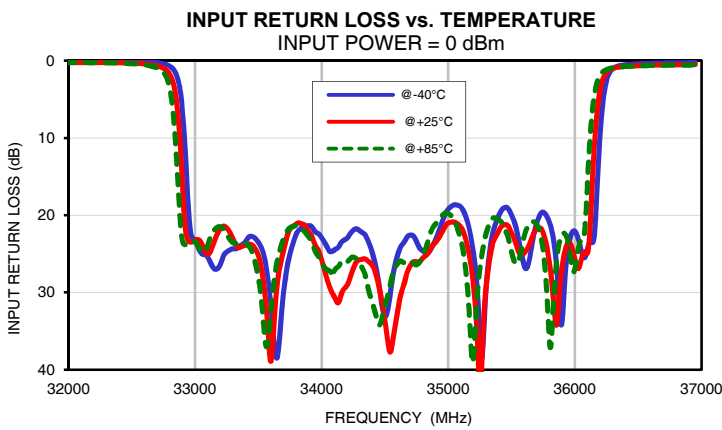
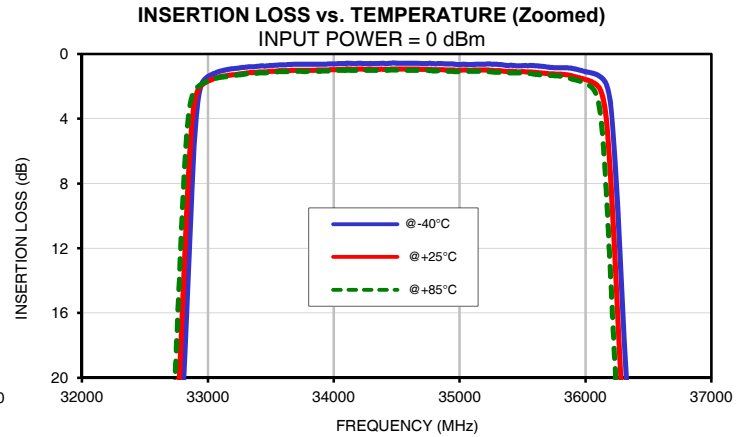
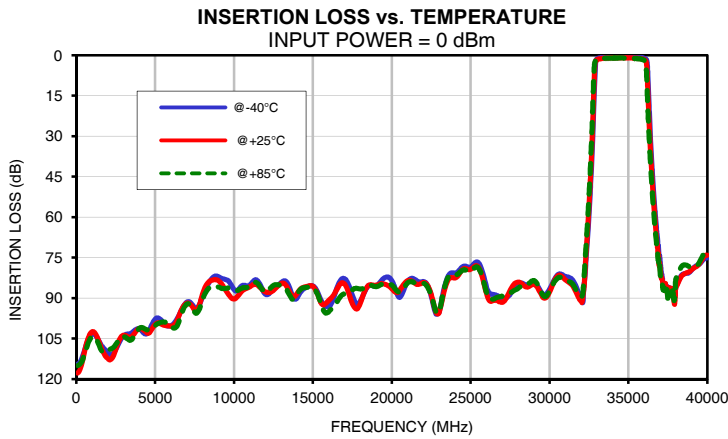
## Typical Performance Data

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	114.47	117.78	115.00	0.07	0.09	0.08	0.06	0.10	0.10
500	109.74	110.59	111.22	0.09	0.13	0.12	0.08	0.12	0.12
1000	103.31	102.49	104.34	0.11	0.16	0.15	0.09	0.15	0.15
2000	110.27	112.41	109.52	0.10	0.17	0.16	0.08	0.16	0.16
3000	104.01	103.78	104.19	0.08	0.15	0.14	0.04	0.13	0.13
4000	101.44	101.31	101.20	0.04	0.12	0.11	0.01	0.10	0.10
5000	97.87	99.82	100.17	0.08	0.17	0.15	0.02	0.12	0.12
6000	100.22	100.43	100.20	0.16	0.25	0.22	0.03	0.15	0.14
7000	91.56	91.88	92.26	0.17	0.27	0.23	0.00	0.13	0.13
8000	89.53	88.75	90.81	0.09	0.20	0.17	0.03	0.11	0.11
9000	82.00	83.50	85.89	0.02	0.13	0.11	0.04	0.11	0.11
10000	86.80	90.34	87.23	0.02	0.10	0.09	0.05	0.11	0.11
11000	85.24	85.81	85.57	0.01	0.13	0.12	0.02	0.14	0.14
12000	88.59	87.72	87.74	0.06	0.20	0.20	0.03	0.20	0.20
13000	84.24	84.52	85.23	0.04	0.17	0.18	0.02	0.14	0.15
15000	85.46	85.63	86.12	0.04	0.10	0.10	0.08	0.12	0.12
20000	83.46	86.51	85.17	0.04	0.23	0.24	0.02	0.25	0.26
25000	78.52	79.36	80.03	0.15	0.07	0.08	0.20	0.08	0.08
30000	86.74	87.87	87.42	0.00	0.28	0.29	0.02	0.31	0.32
32000	89.59	91.11	89.13	0.01	0.24	0.24	0.01	0.33	0.33
32400	69.18	66.41	63.36	0.02	0.27	0.32	0.04	0.35	0.38
32735	31.80	26.67	20.84	0.35	0.86	1.28	0.30	0.81	1.18
32795	22.27	16.30	10.08	0.67	1.60	3.21	0.55	1.47	3.08
32850	12.44	6.81	3.56	1.70	4.90	11.75	1.57	4.87	12.65
32910	3.69	2.44	2.11	8.31	18.78	23.73	8.69	23.19	24.52
33000	1.40	1.68	1.67	23.28	23.28	23.44	21.81	22.66	25.16
33300	0.82	1.19	1.23	24.35	23.11	23.57	27.38	27.43	30.28
33600	0.66	1.02	1.09	31.83	38.92	32.34	28.07	32.03	34.22
34000	0.62	0.97	1.03	22.93	25.84	26.06	22.31	23.53	24.97
34200	0.58	0.93	1.00	22.99	29.10	26.01	23.44	31.15	26.68
34500	0.57	0.93	1.00	33.11	33.56	31.68	29.83	29.68	32.00
34700	0.59	0.95	1.03	22.57	26.53	25.94	24.14	28.01	27.69
35000	0.65	1.00	1.08	19.21	21.01	19.76	19.18	21.60	20.16
35300	0.64	1.02	1.13	29.23	29.14	22.34	27.00	28.18	21.97
35600	0.73	1.13	1.26	26.58	24.91	22.76	30.65	27.25	24.56
36000	1.09	1.58	1.80	22.09	25.72	27.00	19.98	23.02	23.75
36180	2.24	5.36	10.78	15.18	6.03	2.59	15.46	5.78	2.42
36245	7.97	14.50	20.81	2.91	1.65	1.19	2.59	1.46	1.01
36305	17.31	23.40	28.89	0.96	0.98	0.90	0.70	0.86	0.77
36385	28.40	33.46	38.15	0.55	0.76	0.75	0.31	0.64	0.63
36400	30.25	35.18	39.73	0.52	0.74	0.74	0.29	0.62	0.61
36700	58.24	61.53	64.19	0.31	0.56	0.59	0.15	0.47	0.49
37000	75.40	78.04	79.38	0.23	0.50	0.53	0.10	0.41	0.43
37200	84.44	85.19	86.93	0.18	0.47	0.50	0.08	0.38	0.41
37400	86.58	87.48	88.04	0.14	0.44	0.47	0.05	0.35	0.39
37600	86.47	86.34	88.45	0.11	0.42	0.46	0.00	0.32	0.36
37800	87.55	89.21	87.29	0.07	0.38	0.42	0.05	0.29	0.33
38000	86.18	86.47	83.23	0.04	0.35	0.39	0.09	0.27	0.32
38200	83.34	83.71	80.14	0.03	0.34	0.38	0.12	0.25	0.30
38400	81.35	81.69	78.13	0.02	0.33	0.37	0.15	0.23	0.28
38600	80.94	80.86	77.72	0.01	0.32	0.36	0.19	0.21	0.25
38800	80.76	80.42	78.13	0.01	0.30	0.34	0.21	0.19	0.23
39000	79.61	79.54	78.42	0.03	0.28	0.32	0.22	0.19	0.23
39100	78.99	79.06	78.45	0.04	0.27	0.31	0.23	0.19	0.22
39200	78.43	78.66	78.32	0.04	0.26	0.30	0.23	0.19	0.22
39300	78.09	78.37	78.16	0.04	0.26	0.30	0.23	0.19	0.22
39400	77.79	77.96	77.65	0.04	0.26	0.30	0.23	0.19	0.21
39500	77.37	77.29	76.75	0.03	0.26	0.30	0.23	0.19	0.21
39800	75.47	74.62	73.53	0.01	0.27	0.31	0.24	0.18	0.20
40000	75.07	74.11	72.95	0.01	0.27	0.31	0.24	0.18	0.20

## Typical Performance Data

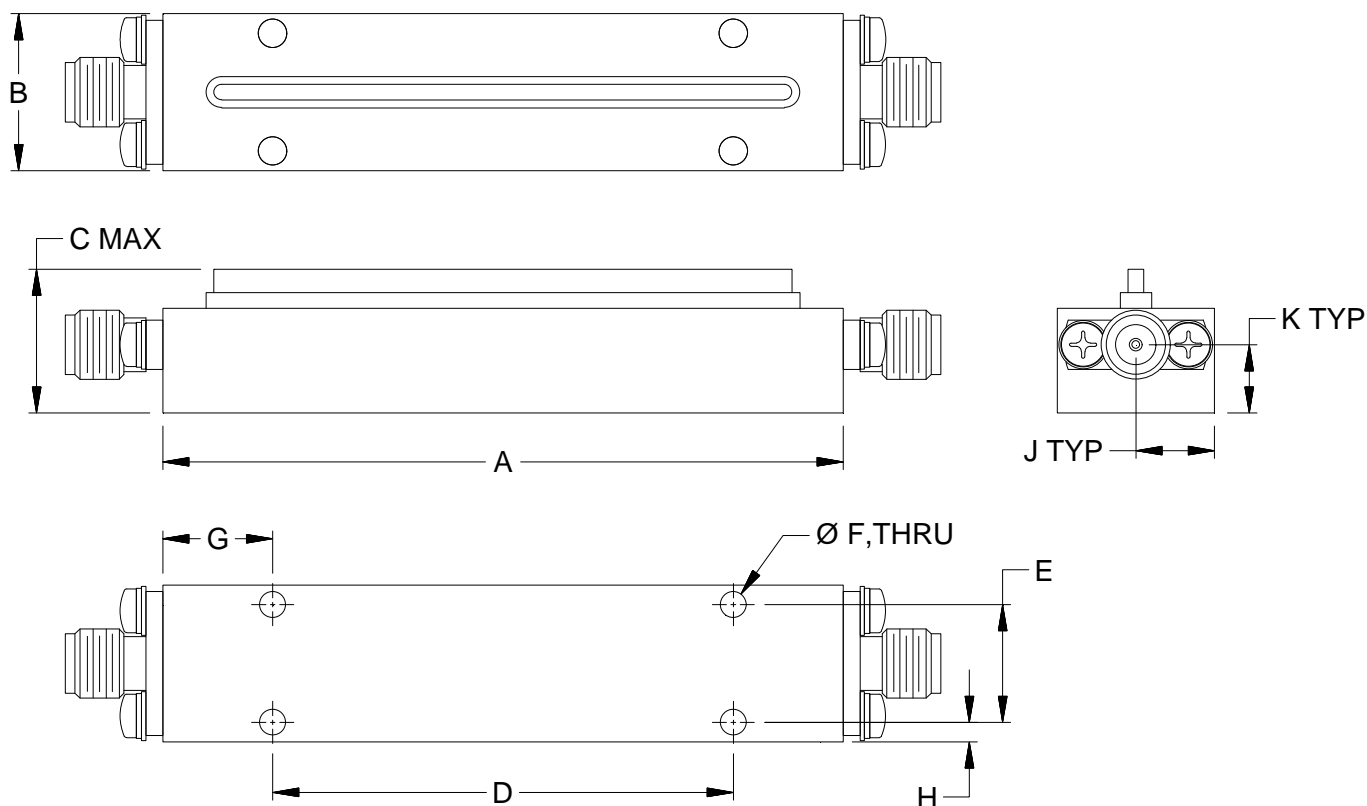
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
33000	3.04	2.70	2.49
33050	2.61	2.42	2.28
33100	2.36	2.23	2.12
33150	2.18	2.08	1.99
33200	2.04	1.96	1.89
33250	1.93	1.86	1.81
33300	1.84	1.79	1.75
33350	1.78	1.73	1.69
33400	1.71	1.67	1.64
33450	1.65	1.62	1.59
33500	1.61	1.58	1.56
33550	1.56	1.54	1.52
33600	1.53	1.51	1.49
33650	1.50	1.48	1.47
33700	1.47	1.45	1.43
33750	1.45	1.43	1.41
33800	1.42	1.40	1.39
33850	1.40	1.38	1.38
33900	1.38	1.37	1.36
33950	1.36	1.35	1.34
34000	1.35	1.34	1.33
34050	1.34	1.33	1.32
34100	1.33	1.32	1.31
34150	1.31	1.30	1.30
34200	1.31	1.31	1.30
34250	1.28	1.28	1.28
34300	1.29	1.29	1.28
34500	1.27	1.27	1.27
34600	1.26	1.26	1.26
34700	1.25	1.26	1.26
34800	1.25	1.25	1.26
34900	1.26	1.26	1.27
35000	1.26	1.27	1.28
35100	1.28	1.29	1.31
35200	1.32	1.33	1.34
35300	1.34	1.35	1.36
35400	1.36	1.38	1.40
35500	1.41	1.44	1.46
35600	1.48	1.50	1.52
35700	1.53	1.57	1.61
36000	2.00	2.14	2.34

## Typical Performance Curves



## Outline Dimensions

WL3322



CASE#	A	B	C	D	E	F
WL3322	2.60 (60.0)	.60 (15.2)	.60 (15.2)	1.760 (44.70)	.450 (11.43)	.100 (2.54)

CASE#	G	H	J	K	WT. GRAMS
WL3322	.42 (10.7)	.08 (1.9)	.30 (7.6)	.26 (6.6)	78

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

### Notes:

1. Case material: Brass.
2. Case Finish: Powder coated.
3. Refer to the individual model data sheet for the type of connectors available.

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

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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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-40° to 85° C Ambient Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet