



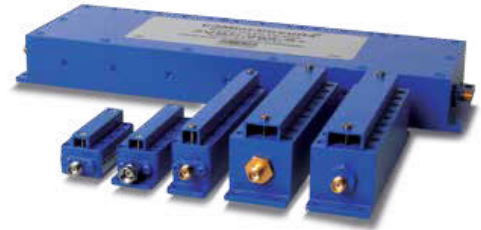
CAVITY

# Bandpass Filter ZVBP MODEL SERIES

50Ω DC to 57 GHz

## THE BIG DEAL

- Very low insertion loss with excellent power handling
- Fast roll-off with wide stopband
- Passbands upto 36 GHz
- Stopband 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 0.5% 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





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# Bandpass Filter

## ZVBP-3300-S+

Mini-Circuits

50Ω 3100 to 3500 MHz SMA-Female

### FEATURES

- Low Insertion loss, 0.6dB typ.
- Good Return loss, 20dB typ.
- Great Rejection (40 to 100 dB typ.)
- Stopband up to 8000 MHz



Generic photo used for illustration purposes only

Model No.	ZVBP-3300-S+
Case Style	YB3391
Connectors	SMA-FEMALE

### APPLICATIONS

- Test & Measurement Equipment
- Radar, EW, and ECM Defense Systems

**+RoHS Compliant**

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

### ELECTRICAL SPECIFICATIONS AT 25°C

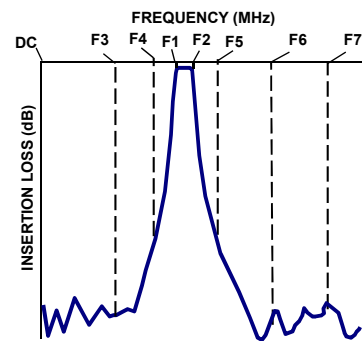
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Center Frequency	Fc	-	-	3300	-	MHz
Passband	Insertion Loss	F1-F2	3100 - 3500	1.7	2.2	dB
	Return Loss	F1-F2	3100 - 3500	14	20	dB
Stop Band, Lower	Rejection	DC-F3	DC - 2985	60	69	dB
		F3-F4	2985 - 3050	33	38	dB
Stop Band, Upper	Rejection	F5-F6	3550 - 3585	40	45	dB
		F6-F7	3585 - 8000	60	70	dB

### MAXIMUM RATINGS

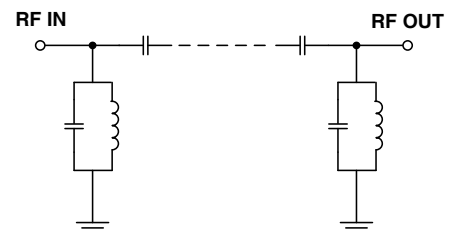
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	20W max. at 25°C

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

### TYPICAL FREQUENCY RESPONSE



### FUNCTIONAL SCHEMATIC



Mini-Circuits



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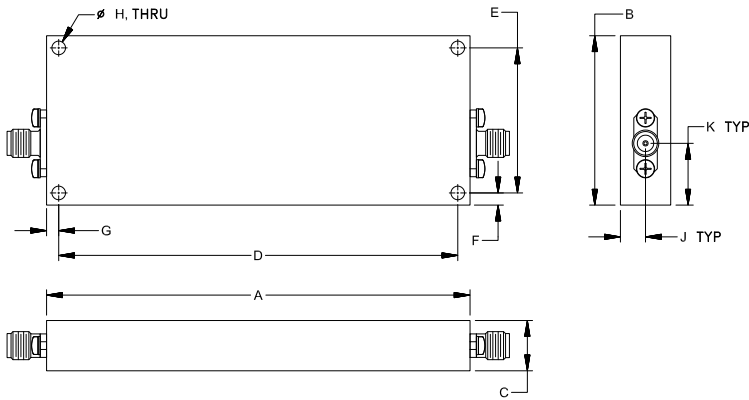
# Bandpass Filter

## ZVBP-3300-S+

### COAXIAL CONNECTIONS

PORT 1	SMA-Female
PORT 2	SMA-Female

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F
4.00	1.60	.48	3.770	1.370	.12
101.6	40.6	12.1	95.76	34.80	2.9
G	H	J	K		Wt.
.12	.130	.24	.58		grams
2.9	3.30	6.0	14.8		210

Note. Please refer to case style drawing for details



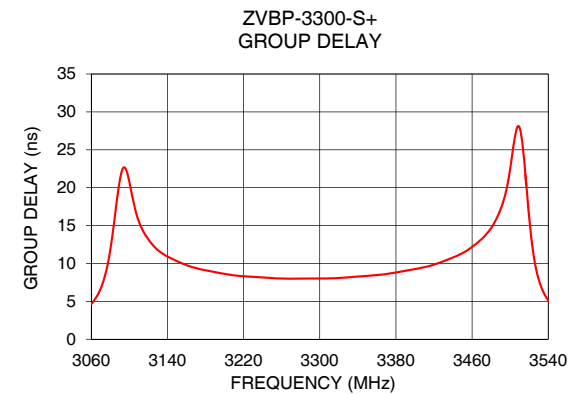
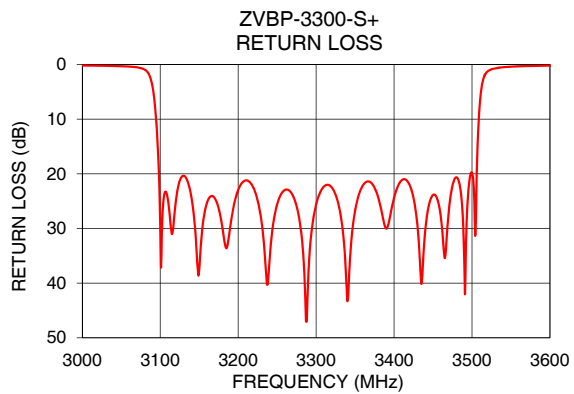
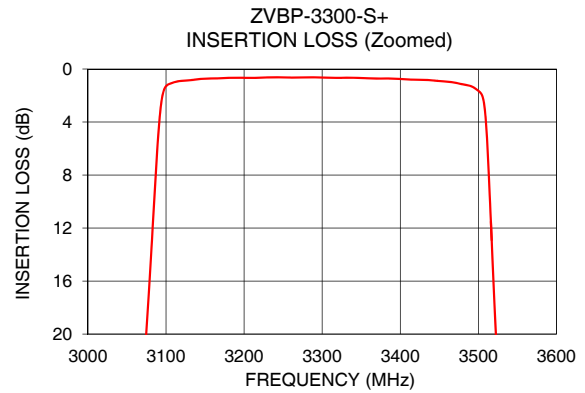
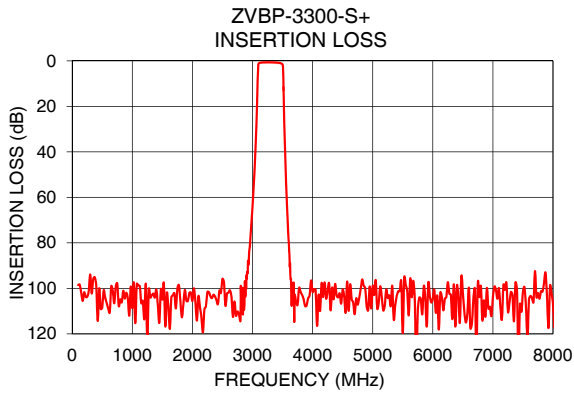
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# Bandpass Filter

## ZVBP-3300-S+

### TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	98.57	0.02	3100	20.78
1000	108.65	0.10	3120	13.16
2985	70.27	0.17	3180	9.10
3050	38.68	0.32	3200	8.62
3075	19.72	0.65	3240	8.16
3093	3.01	7.17	3260	8.01
3100	1.29	29.25	3280	8.00
3300	0.64	25.61	3300	8.02
3500	1.65	19.81	3320	8.08
3508	2.93	11.86	3340	8.28
3525	23.14	0.88	3360	8.47
3535	33.78	0.58	3380	8.81
3550	46.83	0.40	3400	9.26
3585	70.32	0.24	3420	9.85
8000	106.99	0.21	3500	22.51



- 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)



## Typical Performance Data

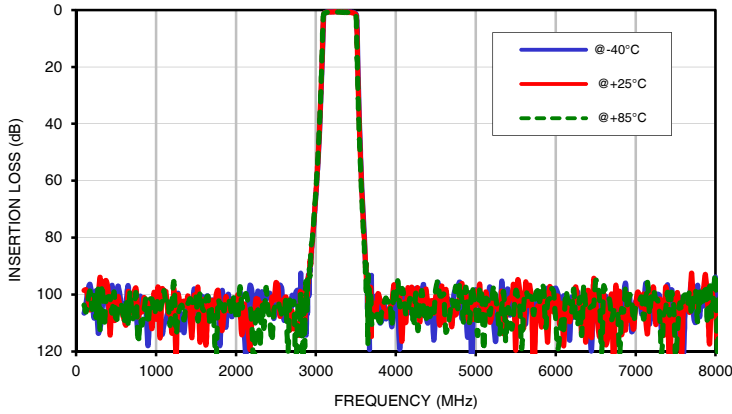
FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	106.57	98.57	103.75	0.02	0.02	0.03	0.00	0.01	0.02
200	101.44	101.74	105.27	0.04	0.05	0.06	0.02	0.03	0.05
300	112.14	93.93	112.36	0.06	0.06	0.08	0.04	0.05	0.07
400	104.88	98.43	100.80	0.07	0.08	0.09	0.06	0.07	0.08
500	100.48	108.45	110.20	0.07	0.08	0.10	0.06	0.08	0.10
600	103.70	108.93	109.99	0.08	0.09	0.11	0.07	0.09	0.11
700	104.04	106.54	108.56	0.08	0.09	0.11	0.07	0.10	0.12
800	100.75	104.86	109.07	0.08	0.10	0.12	0.08	0.10	0.13
1000	103.64	108.65	104.67	0.08	0.10	0.12	0.08	0.11	0.14
1200	106.68	113.51	102.34	0.07	0.09	0.11	0.07	0.11	0.14
1400	105.74	100.52	103.17	0.06	0.08	0.11	0.06	0.10	0.14
1600	108.92	108.13	105.60	0.05	0.08	0.10	0.05	0.10	0.14
1800	118.01	105.48	104.51	0.04	0.07	0.09	0.04	0.09	0.15
2000	102.58	105.55	107.86	0.03	0.06	0.09	0.02	0.08	0.15
2200	98.46	109.24	112.00	0.02	0.06	0.09	0.01	0.08	0.16
2400	101.14	105.18	105.02	0.01	0.06	0.09	0.00	0.08	0.17
2500	103.58	95.81	103.96	0.01	0.06	0.10	0.00	0.08	0.18
2600	109.03	101.91	107.63	0.01	0.06	0.11	0.01	0.09	0.19
2700	100.49	105.79	103.61	0.02	0.07	0.12	0.02	0.10	0.20
2800	106.31	114.15	108.71	0.03	0.09	0.13	0.03	0.12	0.22
2985	71.28	70.27	69.28	0.11	0.17	0.21	0.14	0.22	0.30
3050	40.43	38.68	37.05	0.25	0.32	0.37	0.30	0.39	0.46
3060	33.90	31.90	30.01	0.30	0.38	0.45	0.37	0.46	0.54
3075	22.29	19.72	17.23	0.49	0.65	0.83	0.56	0.73	0.91
3085	12.77	9.83	7.18	1.03	1.67	2.69	1.10	1.73	2.77
3093	4.85	3.01	2.05	3.79	7.17	12.14	3.83	7.13	12.15
3100	1.43	1.29	1.27	15.49	29.25	30.02	15.10	25.23	28.06
3150	0.62	0.73	0.81	34.58	37.59	29.54	35.41	35.73	28.78
3200	0.55	0.67	0.76	24.41	22.95	21.83	23.96	22.77	22.00
3250	0.52	0.64	0.73	27.57	25.57	24.48	26.82	24.99	24.56
3300	0.53	0.64	0.74	27.87	25.61	24.49	26.46	24.90	24.37
3350	0.56	0.68	0.78	30.13	26.71	25.68	26.49	25.03	24.96
3400	0.62	0.75	0.86	26.30	24.38	23.72	28.87	25.57	24.42
3450	0.76	0.91	1.04	24.59	23.86	24.93	24.65	23.92	25.10
3500	1.30	1.65	2.08	21.68	19.81	29.00	21.34	19.48	22.68
3508	1.70	2.93	6.27	34.87	11.86	4.84	24.15	11.09	4.62
3515	5.25	10.16	15.42	5.00	2.41	1.54	4.76	2.33	1.52
3525	18.48	23.14	27.45	1.02	0.88	0.80	1.01	0.89	0.84
3535	29.97	33.78	37.35	0.59	0.58	0.57	0.60	0.62	0.64
3550	43.73	46.83	49.75	0.37	0.40	0.42	0.40	0.45	0.50
3585	67.82	70.32	72.75	0.19	0.24	0.28	0.21	0.29	0.37
3700	101.62	103.06	110.80	0.06	0.12	0.17	0.06	0.16	0.28
3800	109.93	101.59	111.30	0.03	0.10	0.15	0.03	0.13	0.27
4000	100.35	101.54	101.48	0.02	0.09	0.15	0.02	0.13	0.28
4200	100.34	97.39	104.94	0.03	0.10	0.16	0.03	0.14	0.29
4400	110.07	103.23	104.18	0.04	0.11	0.17	0.05	0.16	0.31
4600	98.88	109.86	99.93	0.05	0.12	0.19	0.07	0.18	0.33
4800	95.77	100.39	96.16	0.07	0.14	0.20	0.09	0.20	0.34
5000	98.30	98.93	105.63	0.08	0.15	0.21	0.12	0.22	0.36
5200	102.56	107.84	102.47	0.10	0.16	0.22	0.14	0.25	0.37
5400	98.08	103.37	104.90	0.11	0.18	0.23	0.17	0.27	0.38
5600	104.50	111.84	103.35	0.13	0.19	0.24	0.19	0.29	0.39
5800	105.74	104.61	102.49	0.14	0.20	0.25	0.21	0.30	0.40
6000	97.74	104.41	108.97	0.15	0.20	0.25	0.24	0.32	0.41
6200	100.97	104.57	106.24	0.16	0.21	0.25	0.26	0.34	0.42
6400	105.80	98.98	105.63	0.16	0.21	0.25	0.28	0.35	0.43
6600	114.29	99.77	97.12	0.17	0.22	0.26	0.29	0.37	0.44
7000	102.42	103.89	104.20	0.18	0.22	0.25	0.32	0.39	0.45
7500	104.03	101.33	121.90	0.17	0.22	0.24	0.34	0.41	0.46
8000	94.22	106.99	93.54	0.16	0.21	0.23	0.34	0.42	0.45

## Typical Performance Data

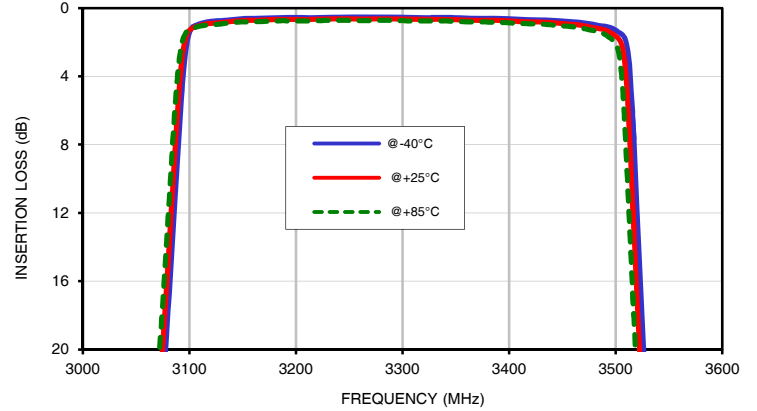
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
3100	22.36	20.78	19.09
3110	16.71	15.53	14.73
3120	13.72	13.16	12.72
3130	12.11	11.76	11.50
3140	11.12	10.92	10.76
3150	10.47	10.31	10.17
3160	9.92	9.78	9.67
3170	9.48	9.38	9.31
3180	9.16	9.10	9.05
3190	8.92	8.86	8.81
3200	8.68	8.62	8.58
3210	8.47	8.43	8.40
3220	8.33	8.31	8.30
3230	8.24	8.23	8.23
3240	8.17	8.16	8.16
3250	8.08	8.08	8.07
3260	8.01	8.01	8.01
3270	7.97	7.99	8.00
3280	7.98	8.00	8.02
3290	8.00	8.01	8.04
3300	8.01	8.02	8.04
3310	8.01	8.03	8.06
3320	8.05	8.08	8.12
3330	8.13	8.17	8.22
3340	8.23	8.28	8.33
3350	8.32	8.37	8.42
3360	8.41	8.47	8.53
3370	8.54	8.61	8.69
3380	8.72	8.81	8.90
3390	8.95	9.04	9.14
3400	9.16	9.26	9.37
3410	9.39	9.51	9.64
3420	9.70	9.85	10.02
3430	10.12	10.30	10.49
3440	10.59	10.79	11.00
3450	11.12	11.37	11.66
3460	11.84	12.18	12.55
3470	12.80	13.22	13.71
3480	14.02	14.67	15.48
3490	16.06	17.17	18.57
3500	19.85	22.51	25.67

## Typical Performance Curves

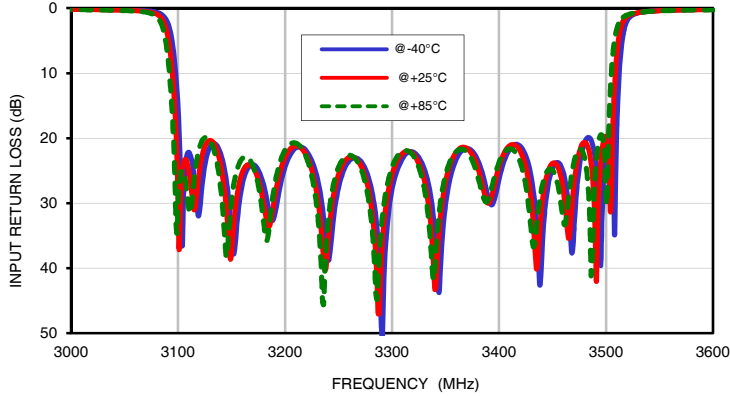
**INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



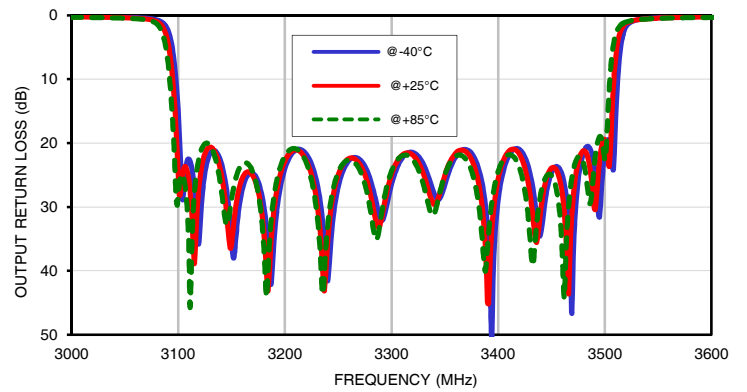
**INSERTION LOSS vs. TEMPERATURE (Zoomed)**  
INPUT POWER = 0 dBm



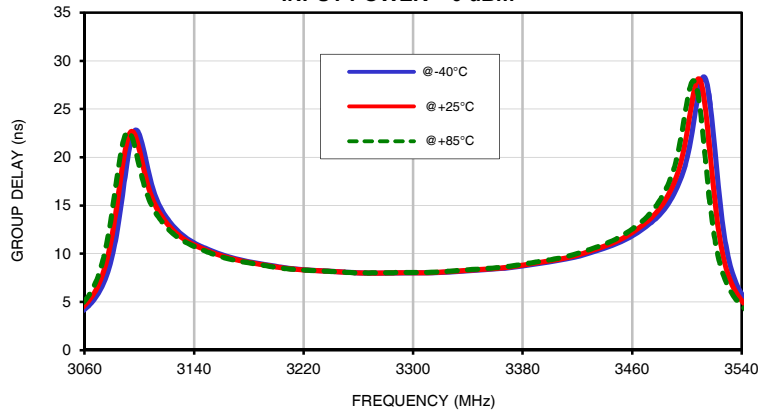
**INPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



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

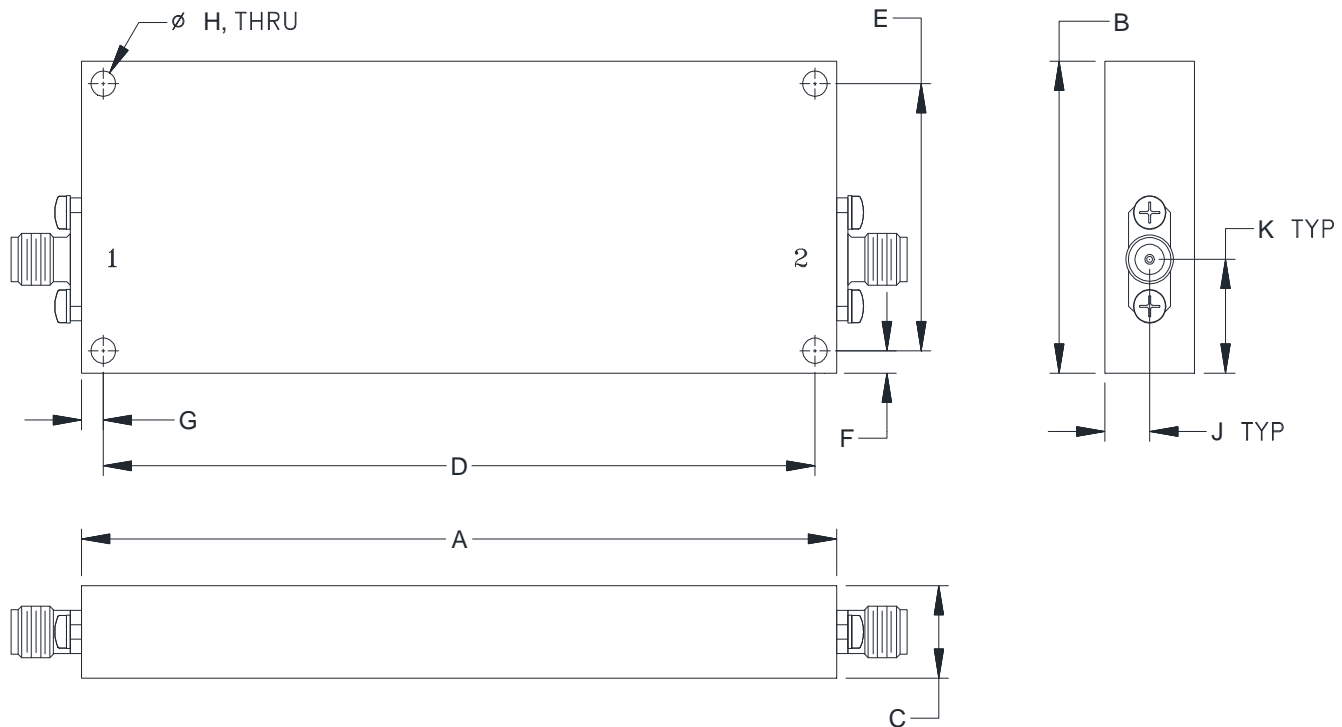


**GROUP DELAY vs. TEMPERATURE**  
INPUT POWER = 0 dBm



## Outline Dimensions

YB3391



CASE#	A	B	C	D	E	F
YB3391	4.00 (101.6)	1.60 (40.6)	.48 (12.1)	3.770 (95.76)	1.370 (34.80)	.12 (2.9)

CASE#	G	H	J	K	WT. GRAMS
YB3391	.12 (2.9)	.130 (3.30)	.24 (6.0)	.58 (14.8)	210

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

### Notes:

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



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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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