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

CAVITY

Bandpass Filter

ZVBP-3100-S+

50Ω 3020 to 3180 MHz SMA-Female

FEATURES

- Low Insertion loss, 1.5dB typ.
- Good Return loss, 20dB typ.
- Great Rejection (40 to 100 dB typ.)
- Stopband up to 7000 MHz

Generic photo used for illustration purposes only

Model No.	ZVBP-3100-S+
Case Style	WZ3389
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

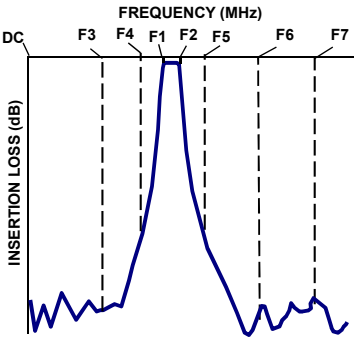
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	-	-	3100	-	MHz
	Insertion Loss	F1-F2	3020 - 3180	-	1.5	2.2	dB
	Return Loss	F1-F2	3020 - 3180	14	20	-	dB
Stop Band, Lower	Rejection	DC-F3	DC - 2975	40	44	-	dB
		F3-F4	2975 - 3000	14	18	-	dB
Stop Band, Upper	Rejection	F5-F6	3200 - 3220	15	20	-	dB
		F6-F7	3220 - 7000	40	44	-	dB

MAXIMUM RATINGS

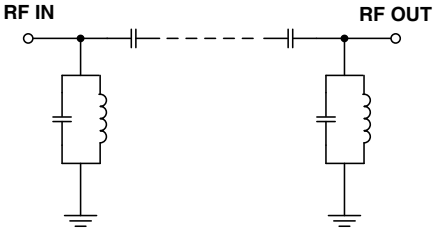
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	20W max. at 25°C

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



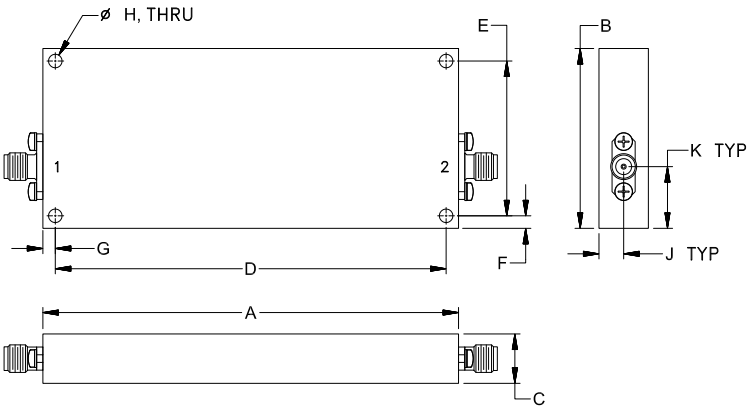
Bandpass Filter

ZVBP-3100-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	**1.73**	**.48**	**3.760**	**1.490**	**.12**
101.6	43.9	12.1	95.50	37.85	3.0
G	H	J	K		Wt.
.12	**.130**	**.24**	**.59**		grams
3.0	3.3	6.0	15.1		210

Note. Please refer to case style drawing for details

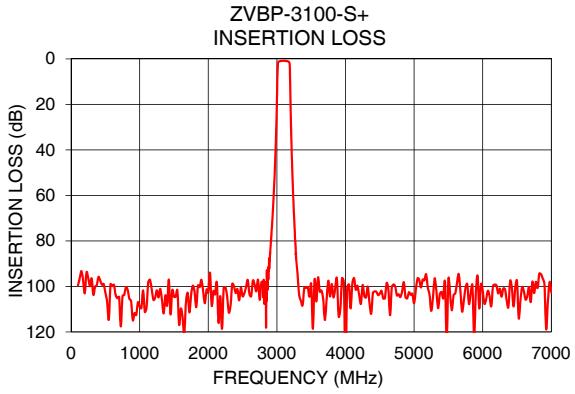
CAVITY

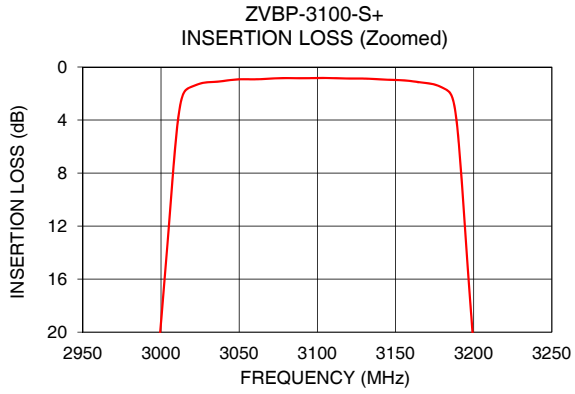
Bandpass Filter

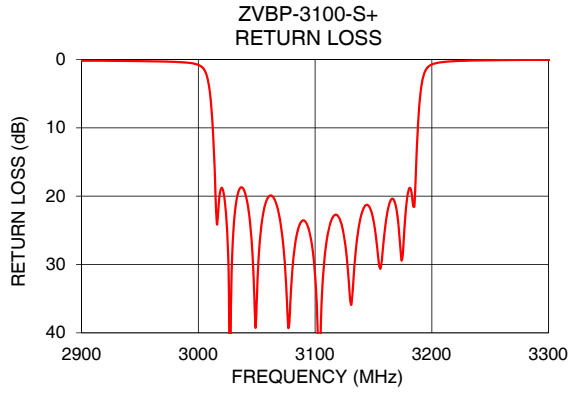
ZVBP-3100-S+

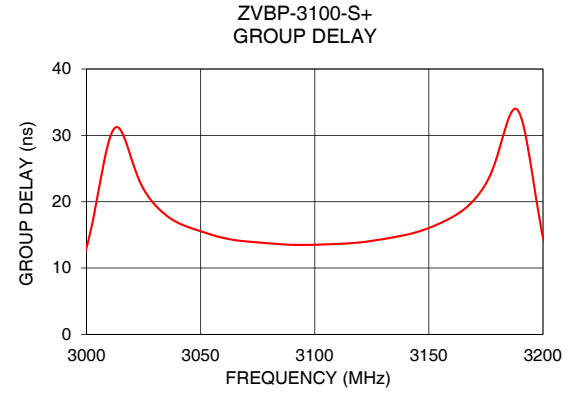
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	99.54	0.04	3020	26.13
1000	108.84	0.06	3030	19.51
2975	44.93	0.32	3040	16.83
2990	31.20	0.45	3050	15.54
3000	19.26	0.78	3060	14.53
3012	3.04	9.12	3070	14.01
3020	1.47	18.78	3080	13.72
3100	0.83	31.60	3090	13.49
3180	1.56	19.16	3100	13.50
3188	3.16	9.96	3110	13.63
3200	21.13	0.73	3120	13.87
3210	34.30	0.36	3130	14.36
3220	44.88	0.24	3140	15.00
5000	107.37	0.17	3150	16.03
7000	102.53	0.01	3180	26.93









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

Cavity Bandpass Filter ZVBP-3100-S+

Typical Performance Data

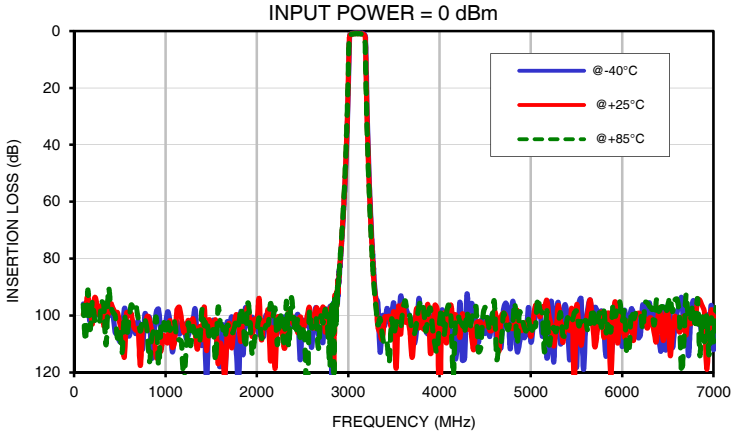
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	95.97	99.54	96.39	0.02	0.04	0.04	0.05	0.06	0.07
200	97.08	103.00	95.08	0.04	0.06	0.07	0.07	0.08	0.10
300	99.31	96.47	95.13	0.05	0.07	0.08	0.07	0.09	0.10
400	98.54	95.83	96.40	0.06	0.08	0.09	0.08	0.09	0.11
500	109.20	102.74	105.31	0.06	0.08	0.09	0.08	0.09	0.11
600	107.28	99.86	101.61	0.05	0.08	0.09	0.07	0.10	0.11
700	101.83	104.66	100.79	0.05	0.08	0.09	0.07	0.09	0.11
800	102.74	100.29	105.69	0.05	0.07	0.09	0.07	0.09	0.11
900	98.59	114.86	100.97	0.03	0.06	0.08	0.06	0.08	0.10
1000	103.07	108.84	105.15	0.02	0.06	0.07	0.05	0.08	0.10
1200	102.97	105.84	123.52	0.01	0.05	0.06	0.04	0.07	0.10
1400	110.48	108.42	97.95	0.00	0.04	0.06	0.03	0.07	0.09
1600	117.71	109.76	102.57	0.00	0.05	0.07	0.03	0.07	0.10
1800	124.18	102.31	103.34	0.00	0.05	0.07	0.03	0.08	0.11
2000	104.19	102.68	105.29	0.01	0.06	0.08	0.04	0.09	0.13
2200	105.28	118.61	97.62	0.02	0.07	0.10	0.05	0.10	0.14
2300	100.49	111.52	109.41	0.02	0.08	0.11	0.05	0.11	0.15
2400	103.49	102.90	99.47	0.03	0.09	0.12	0.06	0.12	0.17
2500	101.77	104.33	104.70	0.04	0.10	0.13	0.07	0.13	0.18
2600	111.23	103.40	104.37	0.05	0.11	0.14	0.07	0.13	0.18
2700	107.46	102.13	100.32	0.06	0.12	0.15	0.08	0.14	0.19
2800	102.36	100.96	117.89	0.07	0.13	0.17	0.10	0.16	0.21
2975	47.05	44.93	42.83	0.24	0.32	0.37	0.27	0.34	0.40
2990	33.98	31.20	28.38	0.35	0.45	0.55	0.37	0.48	0.58
3000	22.80	19.26	15.58	0.55	0.78	1.12	0.57	0.82	1.13
3005	15.98	11.99	8.10	0.87	1.49	2.76	0.89	1.55	2.77
3012	5.45	3.04	2.06	3.96	9.12	19.91	3.94	9.35	19.38
3020	1.40	1.47	1.44	19.68	18.78	20.68	19.25	18.38	20.15
3040	0.94	1.05	1.09	18.42	19.54	23.13	18.33	19.39	23.14
3060	0.78	0.93	1.00	21.65	20.10	20.31	21.79	20.24	20.33
3080	0.71	0.84	0.93	37.78	31.96	25.16	44.26	32.31	25.19
3100	0.71	0.83	0.92	26.45	31.60	47.58	25.62	29.92	34.10
3120	0.73	0.87	0.97	23.12	23.00	23.57	23.26	23.26	23.82
3140	0.78	0.93	1.06	25.69	22.47	21.43	25.66	22.65	21.83
3160	0.89	1.06	1.23	29.40	24.52	21.51	32.29	25.28	21.92
3180	1.24	1.56	1.95	22.65	19.16	19.89	23.45	19.67	21.77
3188	1.79	3.16	6.97	21.32	9.96	3.87	33.47	10.78	4.19
3193	5.09	9.69	15.26	4.88	2.27	1.29	5.24	2.46	1.44
3200	16.48	21.13	25.88	0.92	0.73	0.62	1.03	0.82	0.71
3210	30.67	34.30	38.09	0.34	0.36	0.37	0.40	0.42	0.44
3220	41.84	44.88	48.09	0.18	0.24	0.27	0.23	0.28	0.33
3400	103.62	100.56	110.54	0.04	0.03	0.08	0.01	0.07	0.14
3500	95.59	99.04	106.58	0.06	0.02	0.07	0.02	0.05	0.12
3600	97.64	96.01	97.77	0.06	0.01	0.06	0.03	0.04	0.11
3700	103.10	114.75	106.01	0.07	0.01	0.06	0.03	0.04	0.11
3800	100.76	98.96	94.81	0.07	0.00	0.05	0.04	0.03	0.10
3900	100.18	113.13	97.45	0.08	0.00	0.04	0.04	0.03	0.10
4000	112.73	132.72	102.33	0.08	0.00	0.05	0.04	0.03	0.10
4100	105.59	98.54	96.34	0.07	0.00	0.05	0.03	0.04	0.10
4200	108.85	103.96	99.92	0.06	0.01	0.06	0.02	0.05	0.11
4300	92.63	104.79	98.78	0.05	0.02	0.07	0.01	0.06	0.12
4400	102.73	102.82	96.93	0.03	0.04	0.08	0.00	0.07	0.13
4500	106.34	103.19	97.12	0.02	0.05	0.10	0.02	0.09	0.14
4600	100.33	98.44	95.18	0.01	0.08	0.11	0.05	0.11	0.16
4800	95.25	104.67	102.96	0.05	0.12	0.16	0.09	0.15	0.20
5000	109.31	107.37	106.54	0.11	0.17	0.21	0.14	0.20	0.25
5200	109.79	100.50	110.26	0.14	0.21	0.24	0.18	0.24	0.29
5500	118.27	96.92	98.50	0.18	0.24	0.27	0.21	0.27	0.31
6000	110.96	101.97	102.03	0.13	0.18	0.21	0.16	0.22	0.26
7000	112.02	102.53	109.29	0.05	0.01	0.03	0.01	0.07	0.09

Typical Performance Data

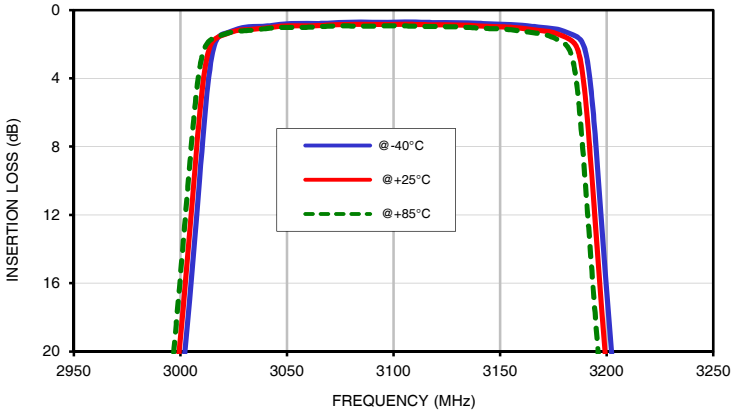
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
3020	29.33	26.13	23.61
3025	24.04	21.88	20.51
3030	20.74	19.51	18.64
3035	18.80	17.91	17.34
3040	17.39	16.83	16.47
3045	16.47	16.12	15.83
3050	15.85	15.54	15.26
3055	15.30	14.99	14.75
3060	14.79	14.53	14.38
3065	14.37	14.21	14.14
3070	14.10	14.01	13.97
3075	13.92	13.86	13.82
3080	13.79	13.72	13.67
3085	13.65	13.58	13.55
3090	13.53	13.49	13.51
3095	13.46	13.47	13.53
3100	13.46	13.50	13.59
3105	13.50	13.56	13.64
3110	13.57	13.63	13.71
3115	13.64	13.72	13.83
3120	13.75	13.87	14.03
3125	13.93	14.09	14.30
3130	14.17	14.36	14.59
3135	14.45	14.66	14.92
3140	14.77	15.00	15.31
3145	15.15	15.44	15.84
3150	15.64	16.03	16.52
3154	16.14	16.61	17.16
3156	16.42	16.92	17.51
3158	16.73	17.26	17.90
3160	17.05	17.62	18.33
3162	17.40	18.02	18.83
3164	17.78	18.48	19.41
3166	18.20	19.01	20.08
3168	18.70	19.63	20.86
3170	19.27	20.35	21.78
3172	19.93	21.18	22.88
3174	20.70	22.16	24.27
3176	21.59	23.37	26.07
3178	22.66	24.92	28.29
3180	24.01	26.93	30.65

Typical Performance Curves

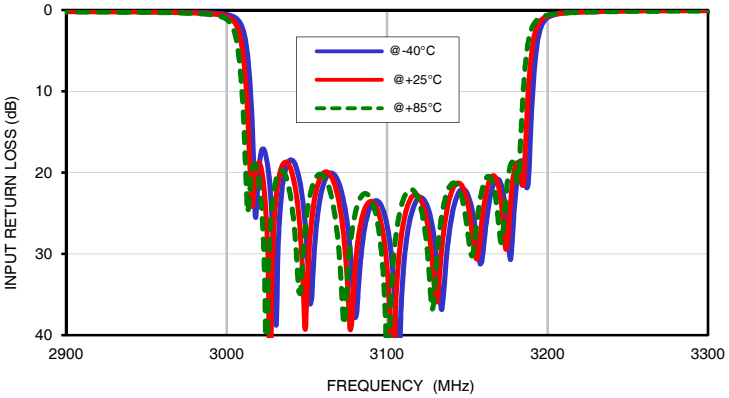
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



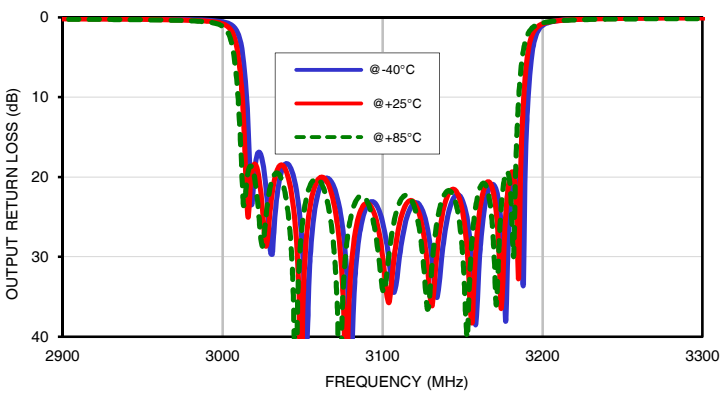
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



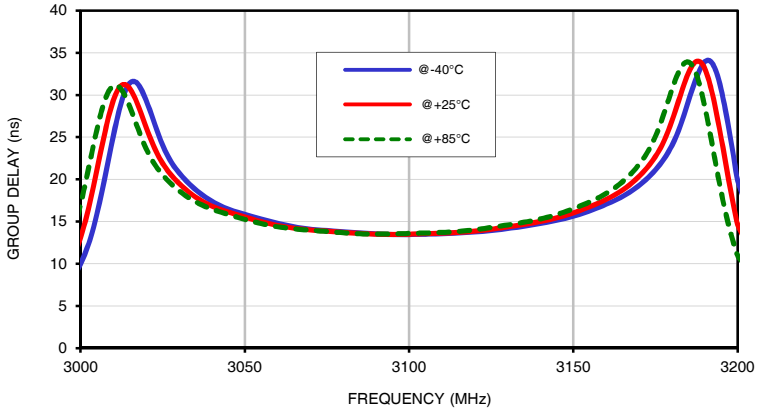
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



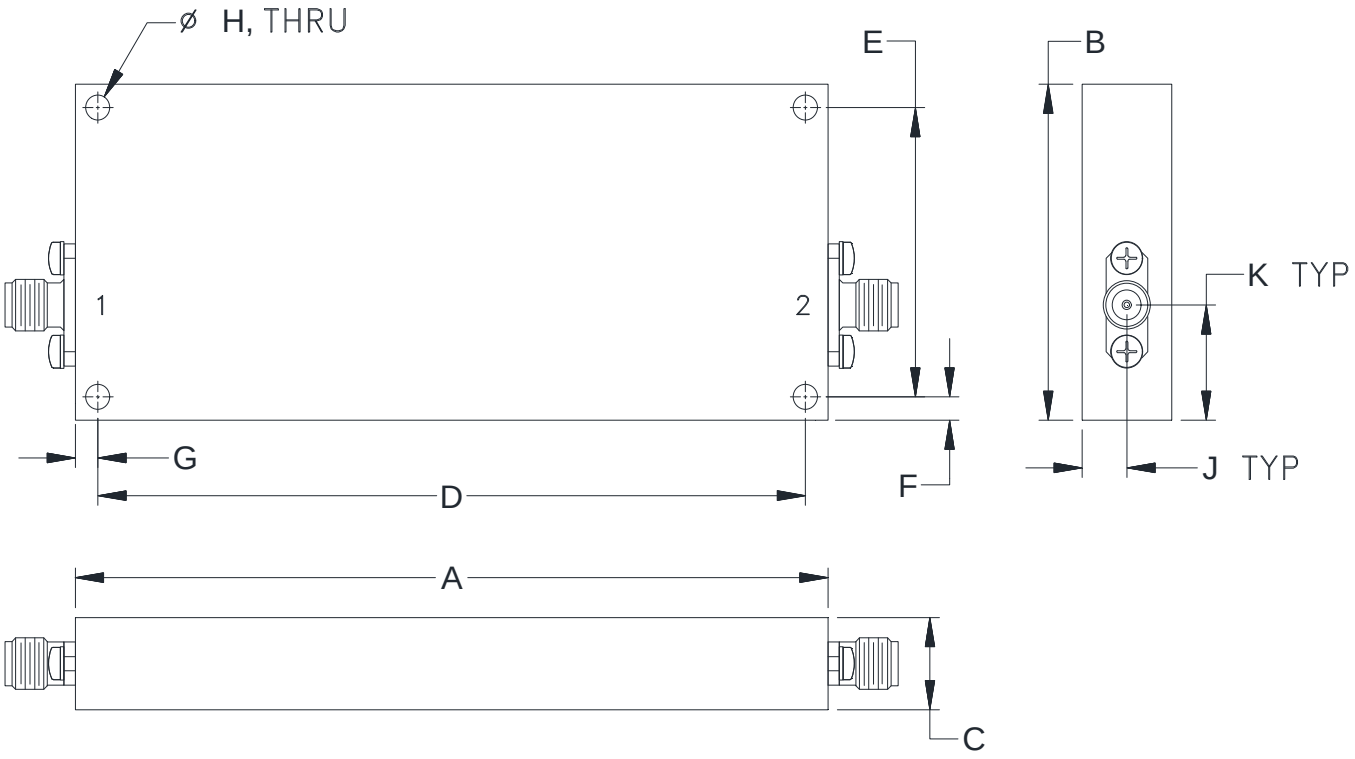
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style WZ

Outline Dimensions

WZ3389



CASE#	A	B	C	D	E	F
WE3389	4.00 (101.6)	1.73 (43.9)	.48 (12.1)	3.760 (95.50)	1.490 (37.85)	.12 (3.0)

CASE#	G	H	J	K	WT. GRAMS
WE3389	.12 (3.0)	.130 (3.30)	.24 (6.0)	.59 (15.1)	210

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .100; 3 Pl. ± .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.

Mini-Circuits

Environmental Specifications ENV46

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, Condintion 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