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-2780-S+

50Ω 2700 to 2860 MHz SMA-Female

FEATURES

- Low Insertion loss, 1.4dB typ.
- Good Return loss, 20dB typ.
- Great Rejection (40 to 100 dB typ.)
- Stopband up to 6000 MHz

Generic photo used for illustration purposes only

Model No.	ZVBP-2780-S+
Case Style	YC3392
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

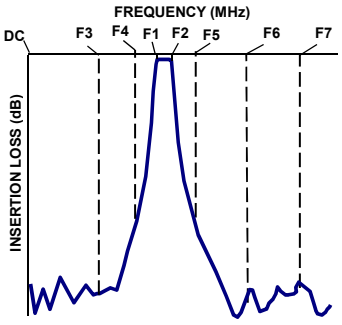
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	-	-	2780	-	MHz
	Insertion Loss	F1-F2	2700 - 2860	-	1.4	2.0	dB
	Return Loss	F1-F2	2700 - 2860	14	20	-	dB
Stop Band, Lower	Rejection	DC-F3	DC - 2655	40	43		dB
		F3-F4	2655 - 2680	14	19	-	dB
Stop Band, Upper	Rejection	F5-F6	2880 - 2900	15	22		dB
		F6-F7	2900 - 6000	40	46	-	dB

MAXIMUM RATINGS

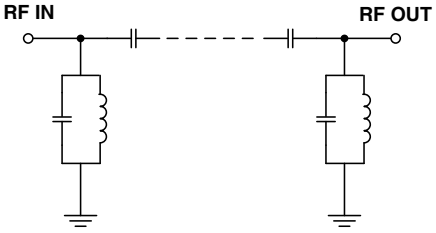
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	20W max. at 25°C

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



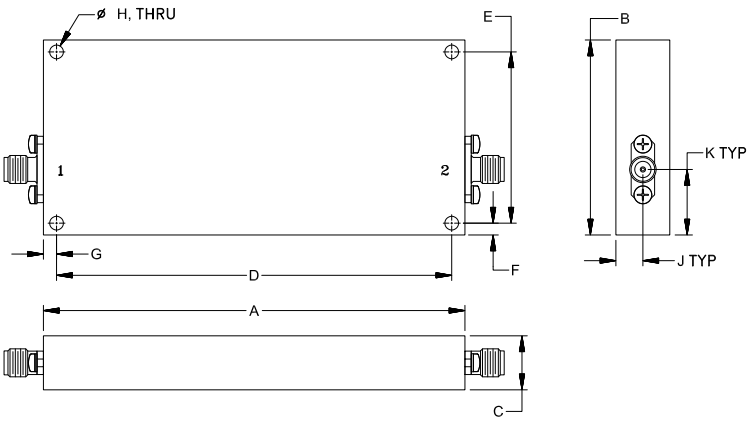
Bandpass Filter

ZVBP-2780-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	**1.85**	**.51**	**3.750**	**1.625**	**.11**
101.6	47.0	13.0	95.25	41.28	2.9
G	H	J	K		Wt.
.13	**.130**	**.26**	**.62**		grams
3.2	3.30	6.5	15.8		240

Note. Please refer to case style drawing for details

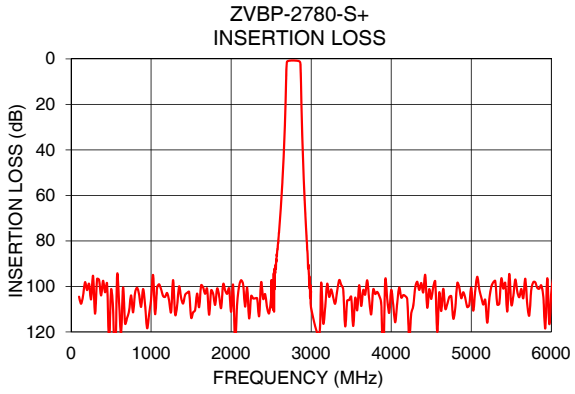
CAVITY

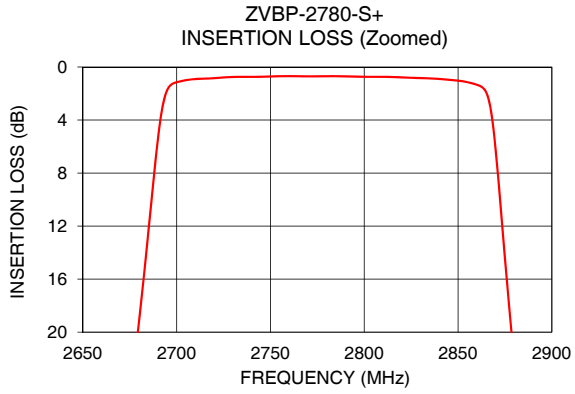
Bandpass Filter

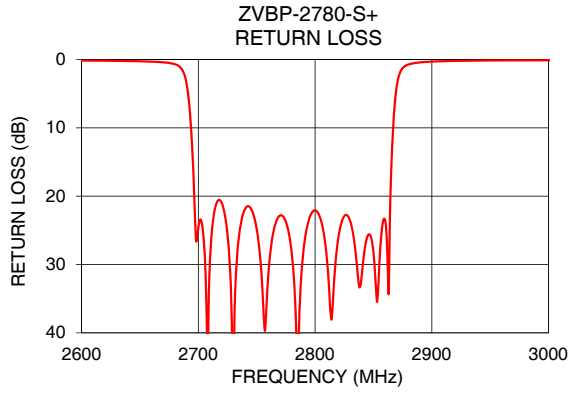
ZVBP-2780-S+

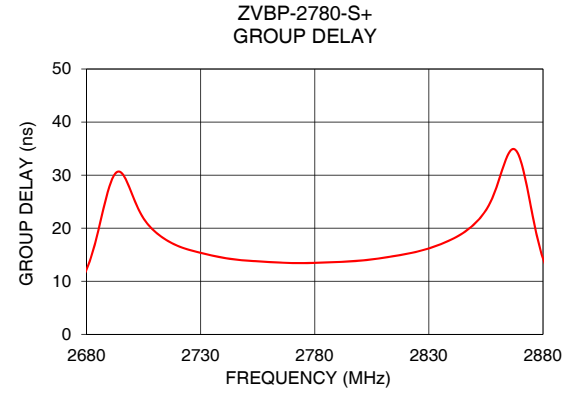
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	104.54	0.02	2700	26.36
1000	105.55	0.08	2710	19.35
2655	43.64	0.28	2750	13.91
2670	30.44	0.41	2760	13.63
2680	19.10	0.69	2770	13.44
2692	3.36	6.28	2780	13.48
2700	1.15	24.56	2790	13.64
2750	0.71	24.85	2800	13.89
2780	0.69	28.38	2810	14.43
2800	0.74	22.07	2820	15.14
2860	1.34	23.55	2830	16.19
2867	2.87	9.40	2840	17.90
2880	22.30	0.72	2845	19.11
2900	45.97	0.31	2850	20.81
6000	102.51	0.23	2860	28.18









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-2780-S+

Typical Performance Data

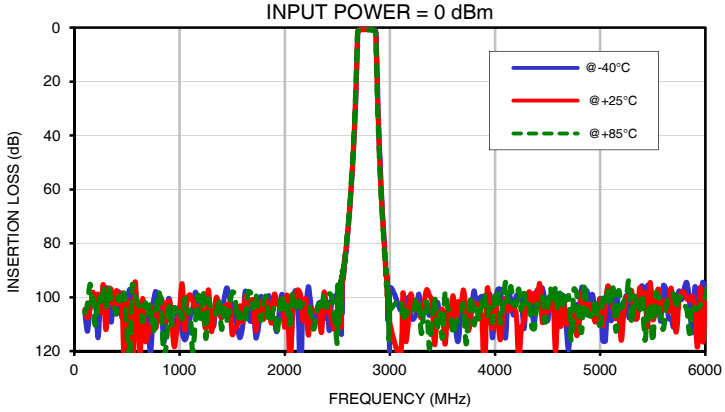
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	105.52	104.54	105.70	0.01	0.02	0.02	0.01	0.03	0.04
200	101.14	101.60	110.37	0.04	0.06	0.07	0.04	0.06	0.06
300	96.48	111.95	104.01	0.08	0.10	0.11	0.06	0.08	0.09
400	106.10	97.54	106.24	0.11	0.12	0.12	0.07	0.09	0.10
500	103.74	101.41	113.02	0.11	0.12	0.12	0.08	0.09	0.11
600	108.80	107.24	101.60	0.10	0.11	0.11	0.08	0.10	0.11
700	107.90	113.87	107.11	0.09	0.10	0.11	0.07	0.10	0.11
800	108.73	102.64	97.96	0.07	0.09	0.10	0.07	0.09	0.11
900	100.44	101.17	103.34	0.06	0.09	0.10	0.06	0.09	0.11
1000	103.81	105.55	105.10	0.05	0.08	0.09	0.06	0.08	0.10
1200	104.41	102.91	107.82	0.04	0.07	0.09	0.04	0.07	0.10
1400	107.63	107.50	111.91	0.03	0.06	0.08	0.03	0.07	0.09
1600	111.00	109.11	108.42	0.02	0.05	0.08	0.02	0.06	0.09
1800	105.64	108.10	101.48	0.01	0.05	0.08	0.01	0.06	0.09
1900	108.37	99.09	104.39	0.01	0.05	0.09	0.01	0.06	0.09
2000	105.40	111.14	105.46	0.01	0.06	0.09	0.01	0.06	0.10
2100	97.56	99.80	103.71	0.01	0.06	0.09	0.01	0.06	0.10
2200	103.89	100.50	102.06	0.01	0.06	0.10	0.01	0.06	0.11
2300	106.86	105.24	106.48	0.02	0.07	0.11	0.02	0.07	0.12
2400	101.59	105.46	103.74	0.03	0.08	0.12	0.02	0.08	0.13
2500	98.59	104.80	117.33	0.05	0.10	0.14	0.04	0.09	0.14
2600	76.31	75.27	74.25	0.10	0.15	0.20	0.09	0.14	0.19
2655	45.19	43.64	42.45	0.22	0.28	0.33	0.20	0.27	0.32
2670	32.49	30.44	28.83	0.33	0.41	0.47	0.30	0.39	0.46
2680	21.71	19.10	17.02	0.52	0.69	0.85	0.50	0.67	0.84
2686	13.84	10.88	8.61	0.94	1.46	2.13	0.93	1.45	2.14
2692	5.44	3.36	2.39	3.35	6.28	9.93	3.38	6.39	10.21
2700	1.11	1.15	1.19	26.67	24.56	24.12	41.90	25.66	24.29
2720	0.75	0.84	0.91	20.46	20.99	21.80	20.26	20.74	21.53
2740	0.64	0.74	0.83	23.22	21.85	20.98	23.22	21.82	20.91
2750	0.62	0.71	0.78	23.18	24.85	26.21	23.17	24.76	26.09
2780	0.60	0.69	0.77	26.02	28.38	30.15	25.79	27.76	29.30
2800	0.63	0.74	0.82	22.05	22.07	22.44	22.07	22.14	22.53
2810	0.64	0.74	0.83	25.59	28.99	32.31	25.84	29.29	32.72
2840	0.76	0.90	1.01	32.26	31.43	29.00	42.84	35.43	30.48
2860	1.08	1.34	1.58	24.56	23.55	28.54	24.81	23.50	26.86
2867	1.59	2.87	4.96	19.80	9.40	5.25	19.03	9.23	5.15
2873	6.75	11.03	14.48	3.12	1.80	1.34	3.07	1.75	1.31
2880	18.35	22.30	25.22	0.82	0.72	0.68	0.79	0.70	0.67
2885	25.74	29.21	31.80	0.53	0.53	0.53	0.51	0.51	0.53
2900	43.34	45.97	47.95	0.26	0.31	0.34	0.25	0.30	0.34
3000	96.88	109.59	104.60	0.05	0.11	0.16	0.05	0.11	0.18
3400	102.33	101.29	108.38	0.04	0.11	0.16	0.04	0.10	0.17
3600	105.40	99.49	113.79	0.05	0.12	0.17	0.05	0.12	0.18
3900	103.07	132.03	98.69	0.08	0.14	0.20	0.07	0.13	0.20
4000	102.76	101.57	99.49	0.08	0.15	0.20	0.07	0.14	0.21
4100	115.01	100.48	94.43	0.09	0.16	0.21	0.08	0.15	0.21
4200	99.55	105.58	102.91	0.10	0.16	0.21	0.09	0.15	0.22
4300	99.56	100.46	102.94	0.10	0.17	0.22	0.09	0.15	0.22
4400	97.44	102.63	101.52	0.11	0.18	0.22	0.09	0.16	0.22
4500	108.81	105.48	103.85	0.12	0.18	0.23	0.10	0.16	0.22
4600	98.63	102.70	104.98	0.12	0.19	0.23	0.11	0.17	0.23
4700	119.37	107.79	99.52	0.13	0.19	0.23	0.11	0.17	0.23
4800	104.01	109.61	108.00	0.14	0.20	0.24	0.11	0.18	0.23
4900	103.78	102.57	106.35	0.14	0.20	0.24	0.12	0.18	0.23
5000	100.75	100.60	110.30	0.15	0.20	0.24	0.12	0.18	0.23
5200	108.79	115.94	103.96	0.16	0.21	0.25	0.13	0.19	0.24
5400	95.77	100.96	99.07	0.17	0.22	0.25	0.14	0.19	0.23
5600	95.79	104.72	111.85	0.17	0.22	0.25	0.14	0.19	0.23
6000	101.87	102.51	100.21	0.18	0.23	0.25	0.14	0.19	0.23

Typical Performance Data

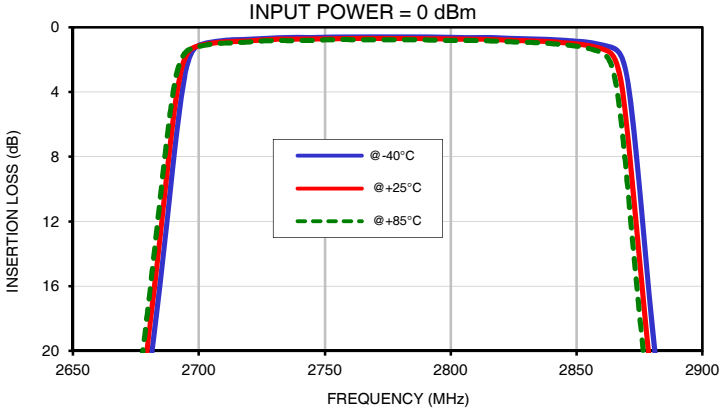
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
2700	28.72	26.36	24.61
2705	23.50	21.83	20.87
2710	20.24	19.35	18.77
2715	18.37	17.76	17.36
2720	17.07	16.66	16.41
2725	16.18	15.92	15.75
2730	15.57	15.36	15.21
2735	15.05	14.85	14.71
2740	14.58	14.42	14.32
2745	14.21	14.11	14.05
2750	13.96	13.91	13.88
2755	13.80	13.76	13.75
2760	13.67	13.63	13.62
2765	13.54	13.51	13.50
2770	13.44	13.44	13.45
2775	13.40	13.43	13.46
2780	13.42	13.48	13.53
2785	13.49	13.55	13.61
2790	13.57	13.64	13.70
2795	13.65	13.73	13.81
2800	13.78	13.89	13.99
2805	13.97	14.12	14.25
2810	14.25	14.43	14.58
2815	14.57	14.77	14.93
2820	14.92	15.14	15.33
2825	15.33	15.60	15.84
2830	15.85	16.19	16.50
2835	16.53	16.96	17.33
2836	16.69	17.13	17.52
2838	17.02	17.50	17.92
2840	17.38	17.90	18.36
2842	17.77	18.34	18.86
2844	18.20	18.84	19.43
2846	18.68	19.40	20.08
2848	19.22	20.05	20.83
2850	19.85	20.81	21.72
2852	20.58	21.70	22.78
2854	21.43	22.76	24.13
2856	22.44	24.11	25.89
2858	23.71	25.88	28.17
2860	25.36	28.18	30.76

Typical Performance Curves

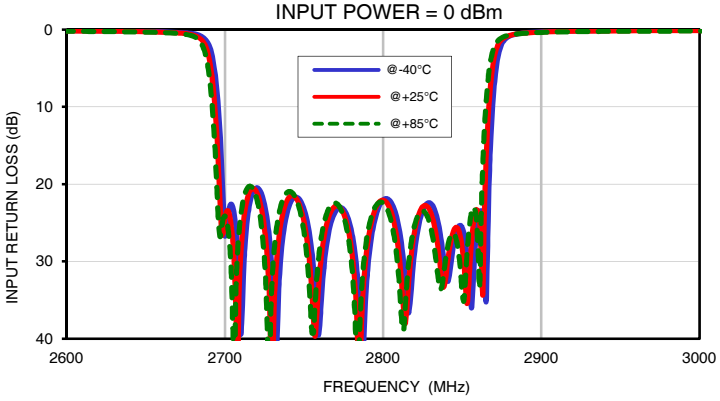
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



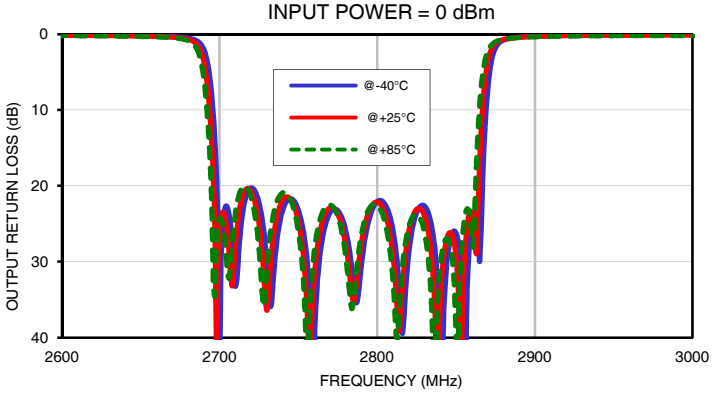
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



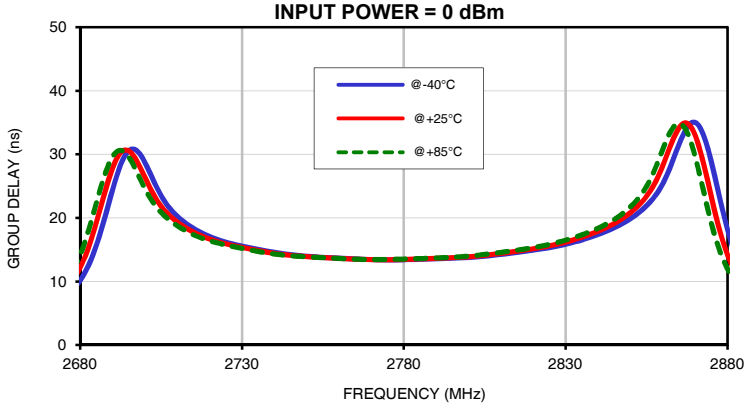
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



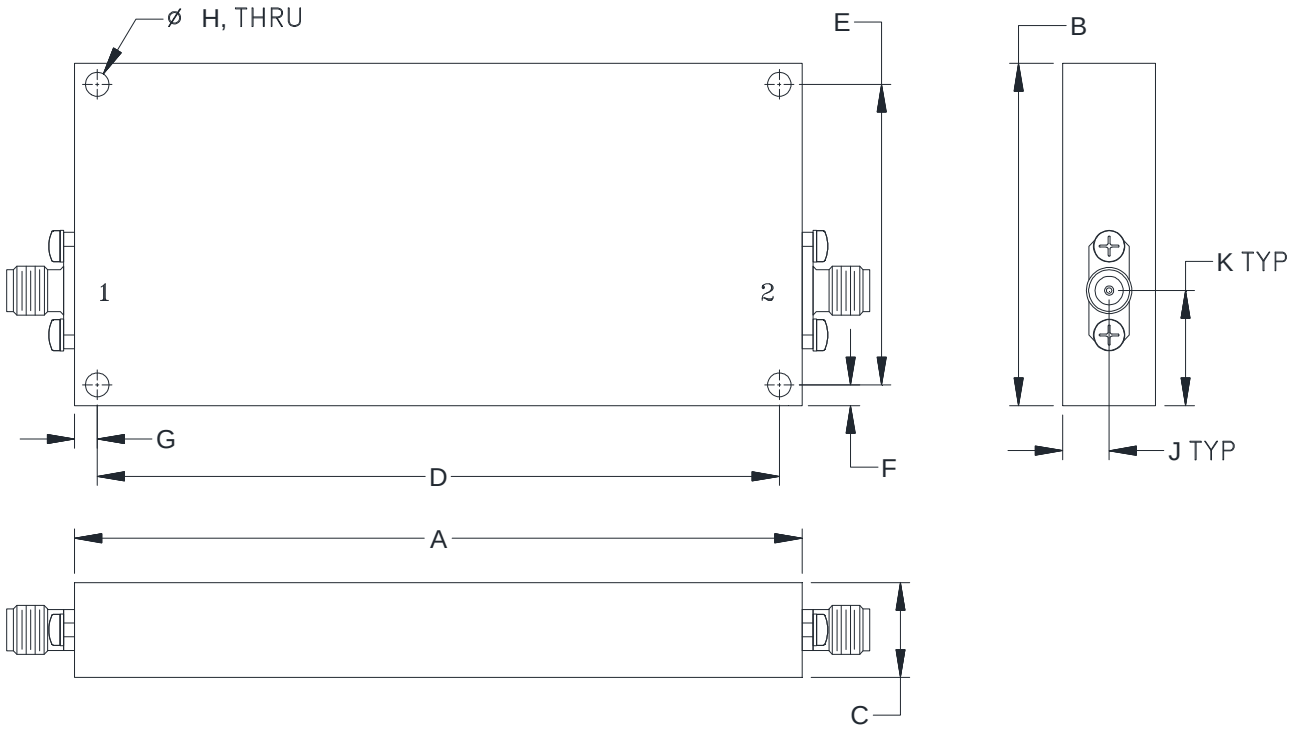
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style YC

Outline Dimensions

YC3392



CASE#	A	B	C	D	E	F
YC3392	4.00 (101.6)	1.85 (47.0)	.51 (13.0)	3.750 (95.25)	1.625 (41.28)	.11 (2.9)

CASE#	G	H	J	K	WT. GRAMS
YC3392	.13 (3.2)	.130 (3.30)	.26 (6.5)	.62 (15.8)	240

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

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