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 Up to 36 GHz
- Stopband Up to 57 GHz

PRODUCT OVERVIEW

Mini-Circuits' coaxial 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 ends. Advanced filter design and construction enables stopband width greater than 3x the center frequency.

Mini-Circuits' coaxial 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.

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-3R25G-S+

50Ω 3000 to 3500 MHz SMA-Female

FEATURES

- Low Insertion Loss of 0.3dB Typ.
- Good Return Loss of 20dB Typ.
- Good Rejection
- Stopband up to 7800 MHz

Generic photo used for illustration purposes only

Model No.	ZVBP-3R25G-S+
Case Style	YM3241
Connectors	SMA-FEMALE

APPLICATIONS

- Test & Measurement Equipment
- R&D Lab, Production, and OTA Test Systems

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

ELECTRICAL SPECIFICATIONS AT 25°C

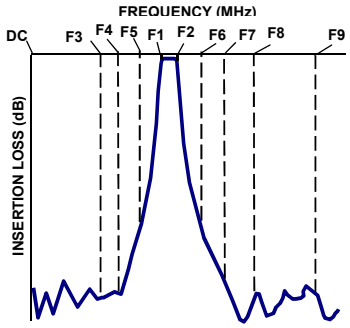
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	—	—	3250	—	MHz
	Insertion Loss	F1-F2	3000 - 3500	—	0.3	0.7	dB
	Return Loss	F1-F2	3000 - 3500	14	19	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 2200	55	61	—	dB
		F3-F4	2200 - 2600	35	40	—	
		F4-F5	2600 - 2850	10	16	—	
Stop Band, Upper	Rejection	F6-F7	3650 - 3800	10	16	—	dB
		F7-F8	3800 - 4100	25	32	—	
		F8-F9	4100 - 7800	45	51	—	

ABSOLUTE MAXIMUM RATINGS

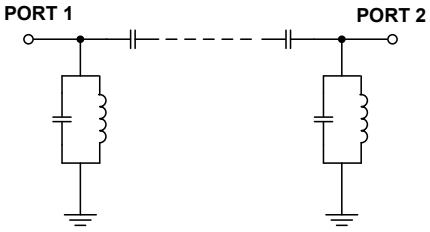
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	25W at 25°C

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL DIAGRAM



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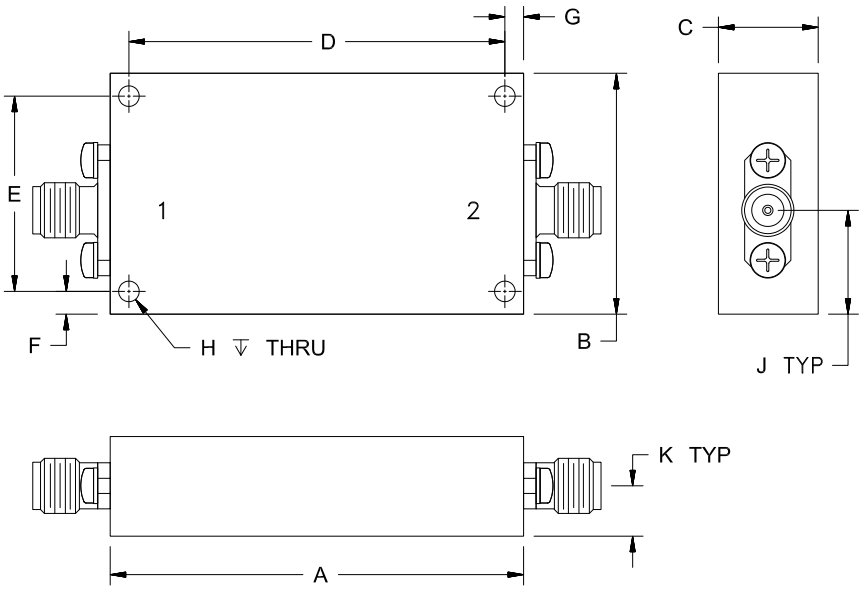
ZVBP-3R25G-S+

COAXIAL CONNECTIONS

PORT 1	SMA-Female
PORT 2	SMA-Female

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F
1.99	**1.16**	**.48**	**1.810**	**.940**	**.11**
50.5	29.5	12.2	45.97	23.88	2.8
G	H	J	K		Wt.
.09	**.100**	**.50**	**.24**		grams
2.3	2.54	12.7	6.2		87

Note. Please refer to case style drawing for details

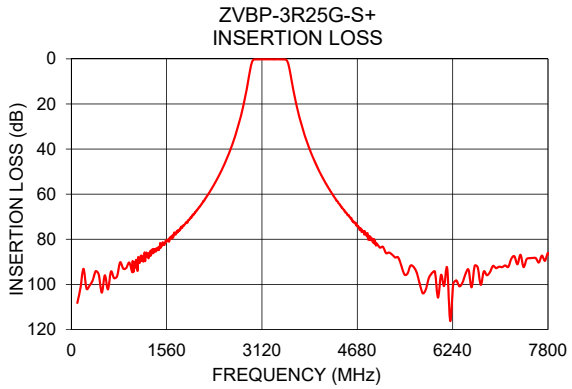
CAVITY

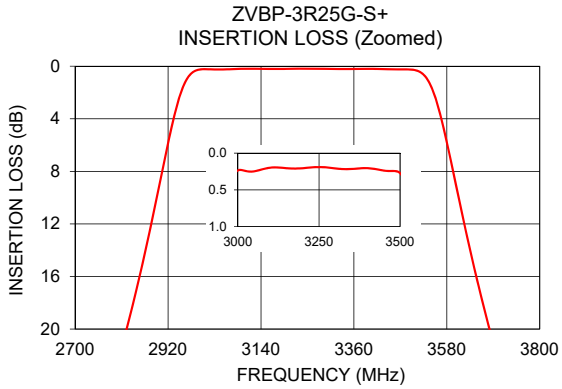
Bandpass Filter

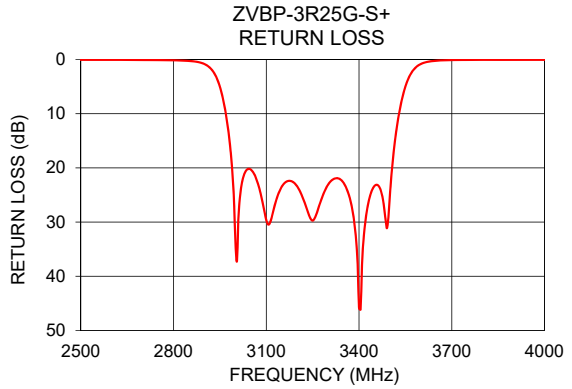
ZVBP-3R25G-S+

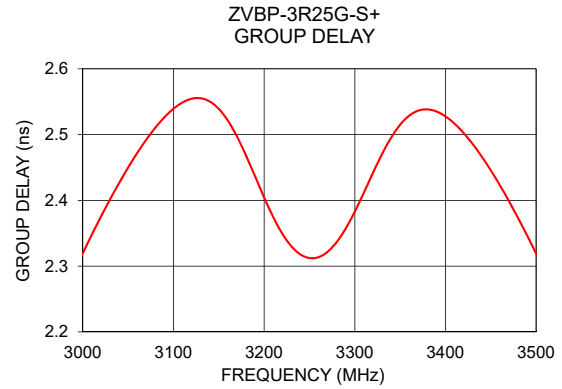
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	108.18	0.02	3000	2.32
2200	61.73	0.04	3030	2.40
2600	40.54	0.07	3060	2.47
2720	30.84	0.10	3090	2.53
2850	16.34	0.27	3120	2.55
2940	3.12	3.48	3150	2.54
3000	0.23	33.54	3180	2.47
3250	0.19	29.72	3210	2.37
3400	0.20	45.84	3250	2.31
3500	0.27	24.90	3270	2.32
3560	3.15	3.46	3300	2.38
3650	16.03	0.22	3350	2.52
3800	32.20	0.06	3400	2.53
4100	52.01	0.08	3450	2.45
7800	86.06	0.17	3500	2.32









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 Band Pass Filter ZVBP-3R25G-S+

Typical Performance Data

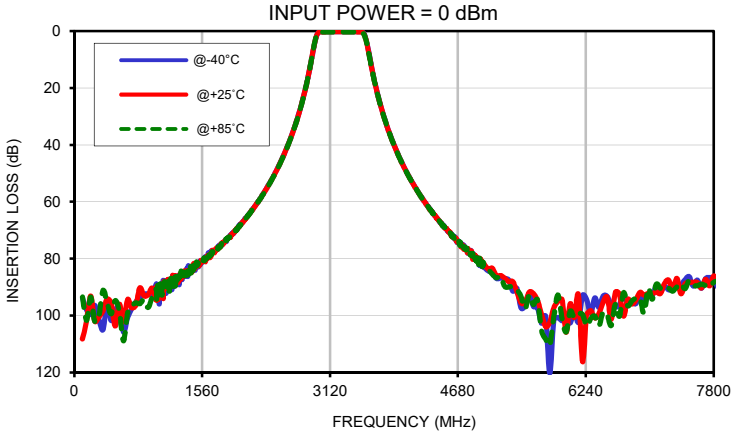
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	93.96	108.18	93.44	0.01	0.02	0.03	0.02	0.03	0.03
150	98.05	101.78	101.66	0.02	0.03	0.04	0.02	0.04	0.04
200	99.60	93.10	93.47	0.02	0.03	0.04	0.03	0.04	0.05
250	96.35	101.90	102.05	0.03	0.04	0.05	0.03	0.05	0.06
300	101.19	100.53	100.26	0.03	0.04	0.05	0.04	0.05	0.06
350	104.93	98.28	91.14	0.04	0.04	0.06	0.04	0.06	0.07
400	95.62	94.15	95.53	0.04	0.05	0.06	0.05	0.06	0.07
450	101.75	95.58	99.34	0.04	0.05	0.07	0.05	0.06	0.08
500	98.45	103.64	94.68	0.04	0.05	0.07	0.05	0.06	0.08
600	105.73	102.18	108.84	0.04	0.06	0.07	0.05	0.07	0.08
700	97.67	97.22	96.64	0.04	0.06	0.08	0.04	0.07	0.08
800	93.62	90.22	95.81	0.04	0.06	0.08	0.04	0.07	0.08
900	92.33	92.71	97.11	0.04	0.06	0.08	0.04	0.06	0.08
1000	88.88	94.58	90.72	0.03	0.06	0.08	0.03	0.06	0.08
1100	87.65	89.30	88.09	0.03	0.05	0.08	0.03	0.06	0.08
1200	85.99	85.85	87.08	0.03	0.05	0.08	0.02	0.05	0.07
1300	85.71	87.21	85.21	0.02	0.05	0.07	0.01	0.05	0.07
1400	83.73	84.23	84.18	0.02	0.05	0.07	0.01	0.04	0.07
1500	81.69	82.41	82.35	0.02	0.05	0.07	0.00	0.04	0.07
1800	74.80	74.48	74.47	0.00	0.04	0.07	0.01	0.03	0.07
2000	68.99	69.20	69.00	0.01	0.03	0.07	0.01	0.04	0.08
2100	65.51	65.65	65.50	0.01	0.03	0.08	0.01	0.04	0.08
2200	61.66	61.73	61.77	0.01	0.04	0.08	0.01	0.04	0.09
2300	57.31	57.42	57.48	0.01	0.04	0.09	0.01	0.04	0.10
2400	52.53	52.59	52.63	0.00	0.05	0.10	0.01	0.05	0.10
2500	46.98	47.05	47.13	0.00	0.06	0.11	0.00	0.06	0.11
2600	40.46	40.54	40.63	0.02	0.07	0.12	0.01	0.07	0.13
2720	30.79	30.84	30.92	0.04	0.10	0.15	0.03	0.09	0.15
2820	20.23	20.23	20.30	0.13	0.18	0.23	0.11	0.17	0.23
2850	16.37	16.34	16.39	0.22	0.27	0.31	0.20	0.26	0.31
2890	10.60	10.51	10.51	0.57	0.63	0.68	0.55	0.62	0.67
2940	3.26	3.12	3.04	3.22	3.48	3.66	3.19	3.46	3.65
3000	0.18	0.23	0.29	26.52	33.54	39.79	26.74	33.23	34.86
3050	0.18	0.25	0.32	21.31	20.31	19.07	21.09	20.15	18.94
3100	0.14	0.20	0.25	29.20	29.64	29.42	28.98	29.57	29.45
3150	0.14	0.21	0.26	24.29	23.46	22.57	25.09	23.94	22.87
3250	0.13	0.19	0.25	27.42	29.72	29.01	29.68	32.14	29.46
3300	0.15	0.21	0.25	21.29	23.06	25.98	21.52	23.26	26.05
3350	0.16	0.22	0.27	21.60	22.76	24.36	21.55	22.65	24.18
3400	0.14	0.20	0.26	44.45	45.84	43.33	35.71	34.91	35.42
3450	0.18	0.24	0.29	22.01	23.33	25.74	21.91	23.17	25.71
3500	0.19	0.27	0.35	28.42	24.90	21.68	29.29	25.60	22.14
3560	2.88	3.15	3.35	3.64	3.46	3.34	3.66	3.49	3.37
3610	10.05	10.30	10.41	0.57	0.61	0.65	0.58	0.62	0.67
3650	15.84	16.03	16.09	0.16	0.22	0.28	0.17	0.24	0.30
3690	20.92	21.08	21.11	0.05	0.12	0.18	0.06	0.13	0.20
3800	32.09	32.20	32.21	0.01	0.06	0.14	0.00	0.08	0.15
3900	39.93	40.03	40.05	0.01	0.07	0.14	0.01	0.07	0.15
4000	46.44	46.52	46.51	0.01	0.07	0.15	0.01	0.07	0.16
4100	51.93	52.01	52.08	0.00	0.08	0.16	0.01	0.08	0.16
4300	61.06	61.14	61.11	0.02	0.09	0.17	0.00	0.09	0.18
4500	68.24	68.27	68.39	0.03	0.10	0.18	0.01	0.10	0.19
4700	74.03	74.38	75.20	0.05	0.12	0.20	0.02	0.11	0.20
5000	82.90	81.88	82.73	0.07	0.14	0.22	0.04	0.13	0.21
5500	96.44	95.25	97.52	0.11	0.17	0.23	0.07	0.15	0.22
6000	100.67	105.84	105.70	0.13	0.19	0.24	0.10	0.17	0.23
6500	93.20	93.52	99.66	0.14	0.20	0.24	0.11	0.17	0.22
7000	93.22	92.16	90.36	0.14	0.19	0.23	0.11	0.17	0.21
7500	86.27	88.38	87.57	0.13	0.18	0.21	0.10	0.16	0.20
7800	87.07	86.06	88.30	0.12	0.17	0.21	0.09	0.16	0.19

Typical Performance Data

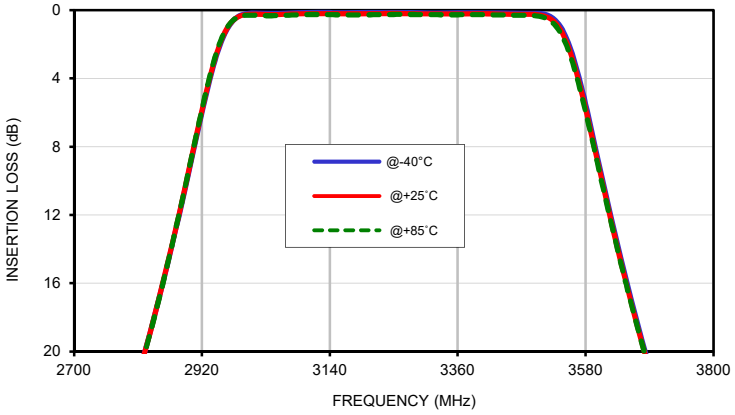
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
3000	2.32	2.32	2.32
3010	2.34	2.35	2.35
3020	2.37	2.38	2.38
3030	2.40	2.40	2.40
3040	2.42	2.43	2.43
3050	2.45	2.45	2.45
3060	2.47	2.47	2.48
3070	2.49	2.49	2.50
3080	2.51	2.51	2.51
3090	2.52	2.53	2.53
3100	2.53	2.54	2.54
3110	2.54	2.55	2.55
3120	2.55	2.55	2.56
3130	2.55	2.56	2.56
3140	2.55	2.55	2.55
3150	2.54	2.54	2.54
3160	2.52	2.52	2.52
3170	2.50	2.50	2.50
3180	2.47	2.47	2.47
3190	2.44	2.44	2.44
3200	2.41	2.40	2.40
3210	2.38	2.37	2.37
3220	2.35	2.35	2.35
3230	2.33	2.33	2.33
3240	2.32	2.32	2.32
3250	2.31	2.31	2.31
3260	2.31	2.31	2.32
3270	2.32	2.32	2.32
3280	2.33	2.34	2.34
3290	2.35	2.36	2.36
3300	2.38	2.38	2.39
3310	2.41	2.41	2.41
3320	2.44	2.44	2.44
3330	2.47	2.47	2.47
3340	2.49	2.50	2.49
3350	2.52	2.52	2.51
3360	2.53	2.53	2.53
3370	2.54	2.54	2.53
3400	2.53	2.53	2.52
3450	2.45	2.45	2.44
3500	2.32	2.32	2.32

Typical Performance Curves

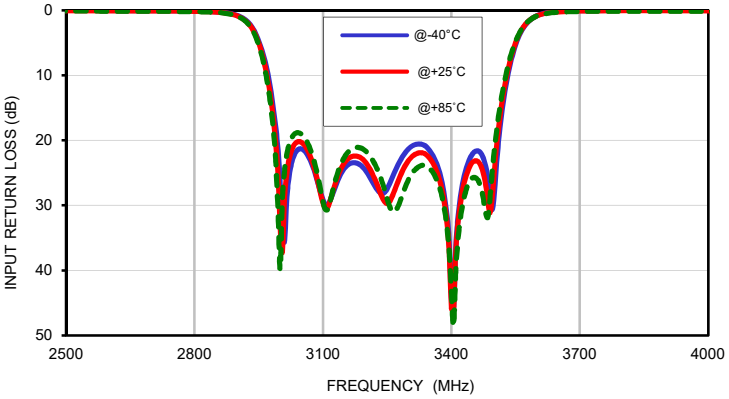
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



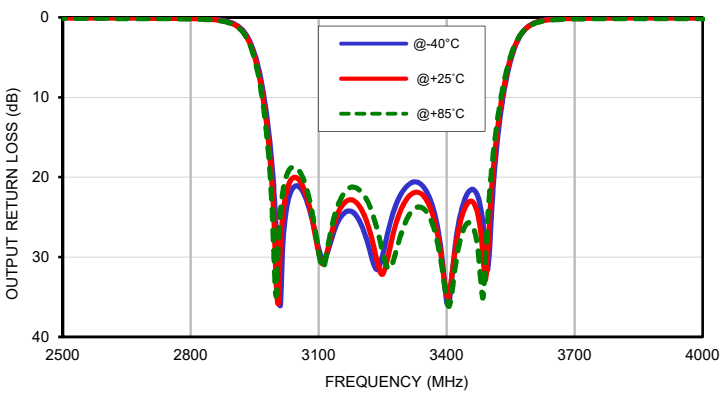
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



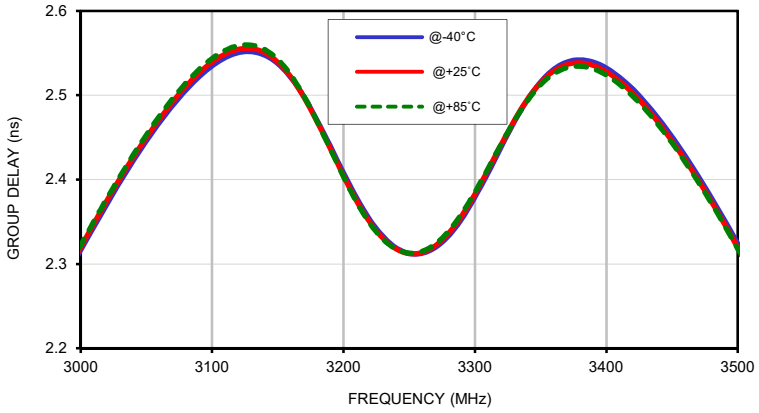
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



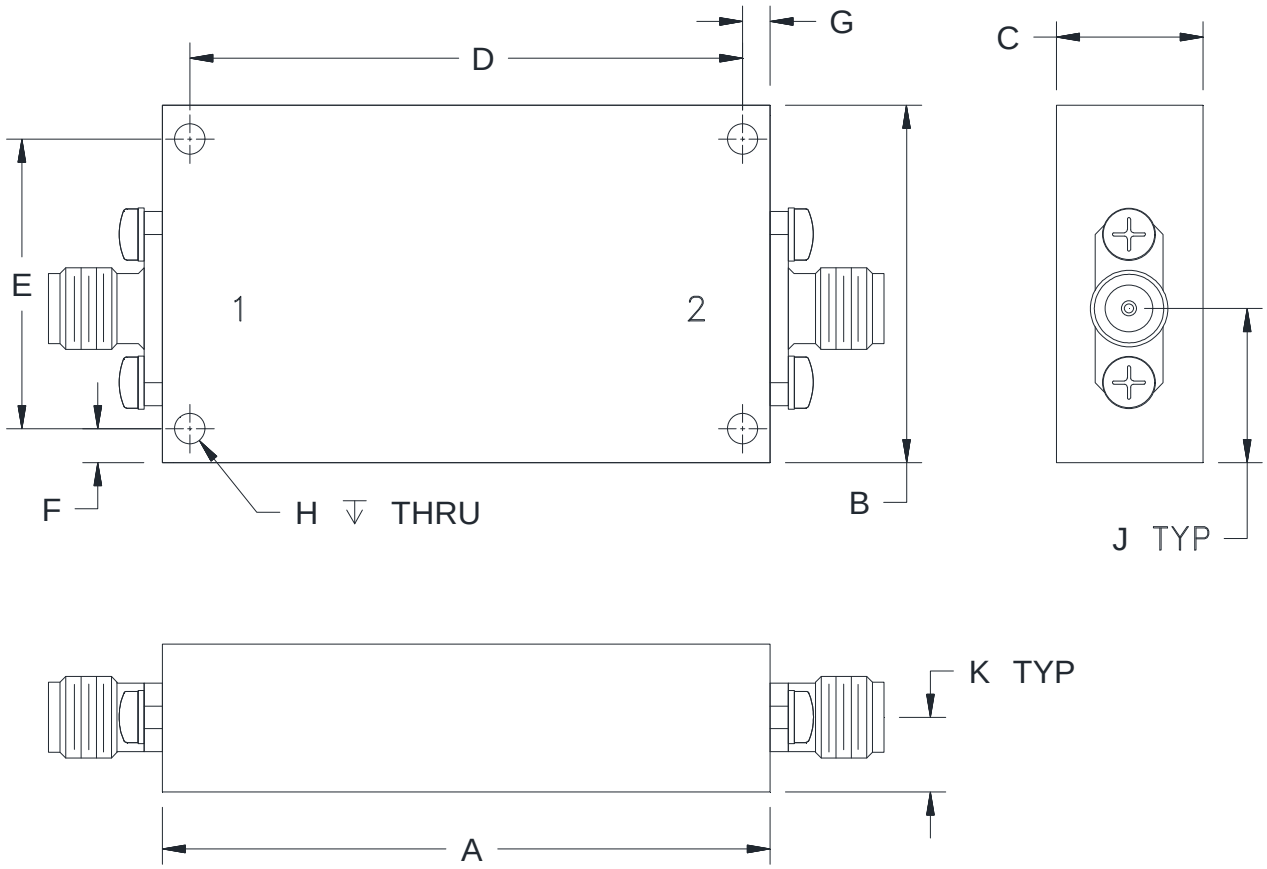
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style YM

Outline Dimensions

YM3241



CASE#	A	B	C	D	E	F
YM3241	1.99 (50.5)	1.16 (29.5)	.48 (12.2)	1.810 (45.97)	.940 (23.88)	.11 (2.8)

CASE#	G	H	J	K	WT. GRAMS
YM3241	.09 (2.3)	.100 (2.54)	.50 (12.7)	.24 (6.2)	87

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