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 end. 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-3100A-S+

50Ω 3020 to 3180 MHz SMA-Female

FEATURES

- Low Insertion Loss of 1.0dB Typ.
- Good Return Loss of 20dB Typ.
- High Rejection
- Sharp Roll-Off

Generic photo used for illustration purposes only

Model No.	ZVBP-3100A-S+
Case Style	YK3431
Connectors	SMA-FEMALE

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

APPLICATIONS

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

ELECTRICAL SPECIFICATIONS AT 25°C

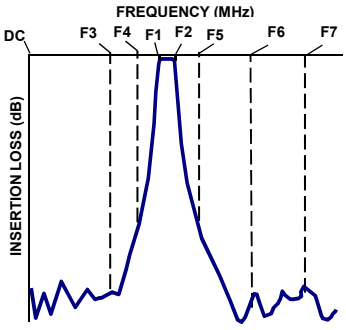
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	—	—	3100	—	MHz
	Insertion Loss	F1-F2	3020 - 3180	—	1.0	1.5	dB
	Return Loss	F1-F2	3020 - 3180	14	20	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 2900	58	65	—	dB
		F3-F4	2900 - 2960	30	39	—	
Stop Band, Upper	Rejection	F5-F6	3198 - 3210	30	39	—	dB
		F6-F7	3210 - 6500	58	64	—	

ABSOLUTE MAXIMUM RATINGS

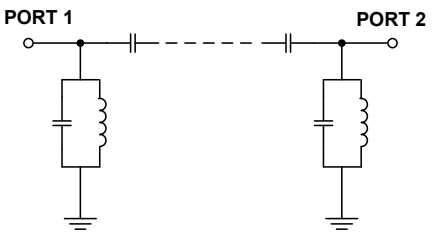
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	30W at 25°C

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



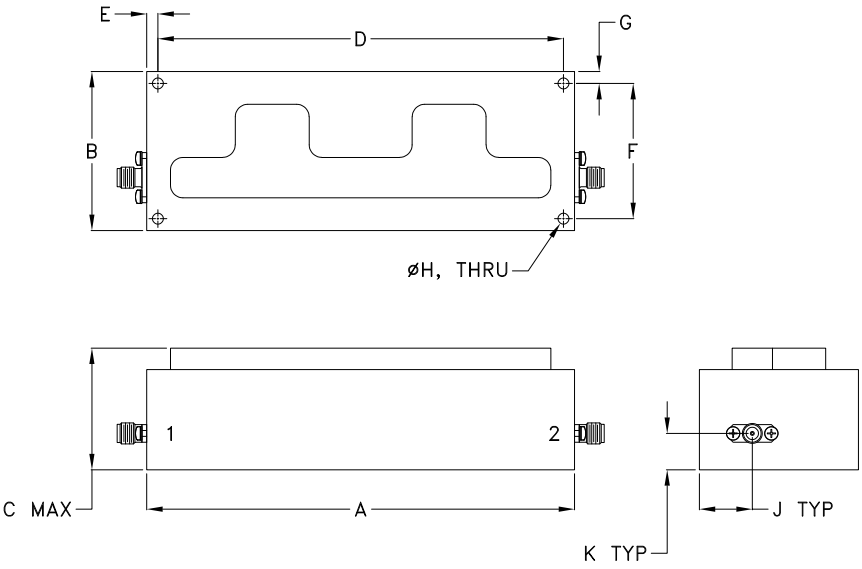
Bandpass Filter

ZVBP-3100A-S+

COAXIAL CONNECTIONS

PORT 1	SMA-Female
PORT 2	SMA-Female

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F
5.38	**2.00**	**1.53**	**5.100**	**.14**	**1.700**
136.7	50.8	38.9	129.54	3.6	43.18
G	H	J	K		Wt.
.15	**.140**	**.67**	**.46**		grams
3.8	3.55	16.9	11.6		483

Note. Please refer to case style drawing for details

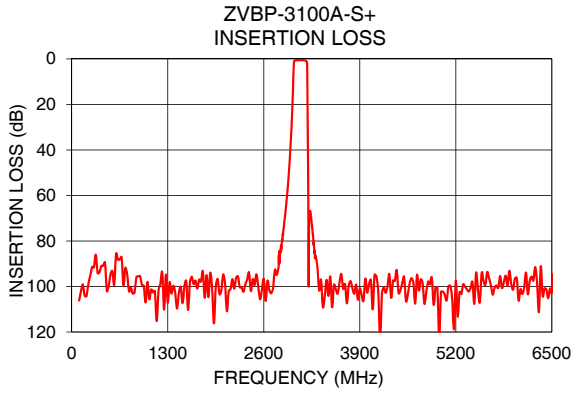
CAVITY

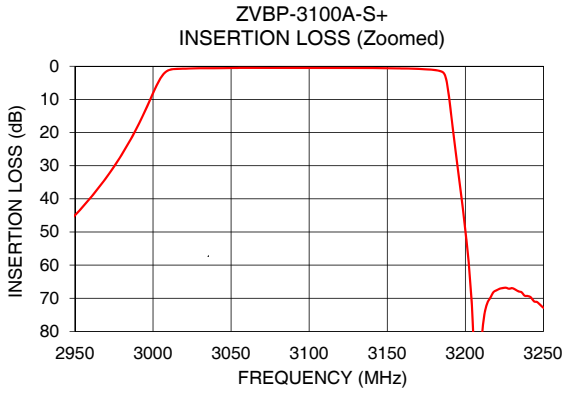
Bandpass Filter

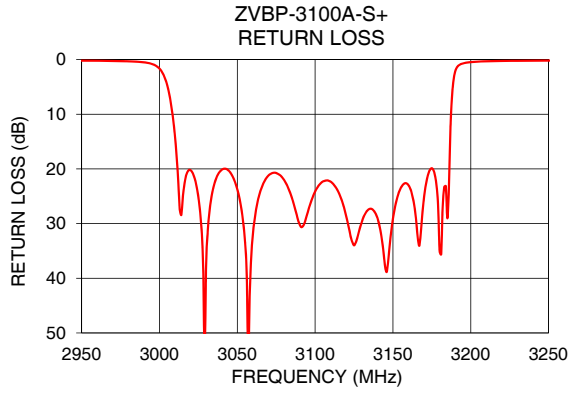
ZVBP-3100A-S+

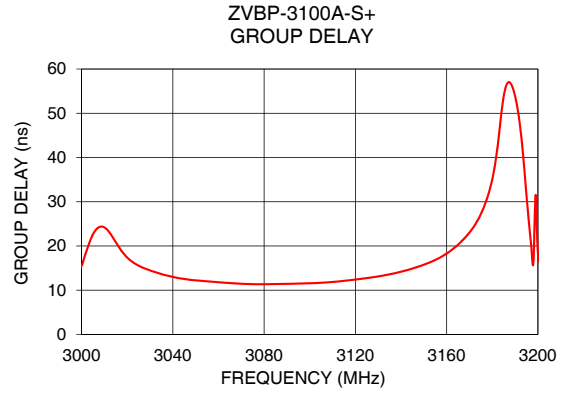
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	106.15	0.04	3020	17.36
2900	65.11	0.15	3030	14.47
2960	39.66	0.22	3040	12.98
2970	33.62	0.26	3050	12.22
2990	18.23	0.50	3060	11.80
3005	3.45	4.76	3070	11.45
3020	0.73	20.25	3080	11.35
3060	0.50	31.92	3090	11.44
3100	0.50	24.13	3100	11.56
3140	0.55	28.95	3110	11.85
3180	1.10	35.05	3120	12.40
3187	2.76	12.27	3130	13.11
3198	41.41	0.53	3140	14.17
3210	84.75	0.31	3150	15.76
6500	102.74	0.13	3180	35.09









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-3100A-S+

Typical Performance Data

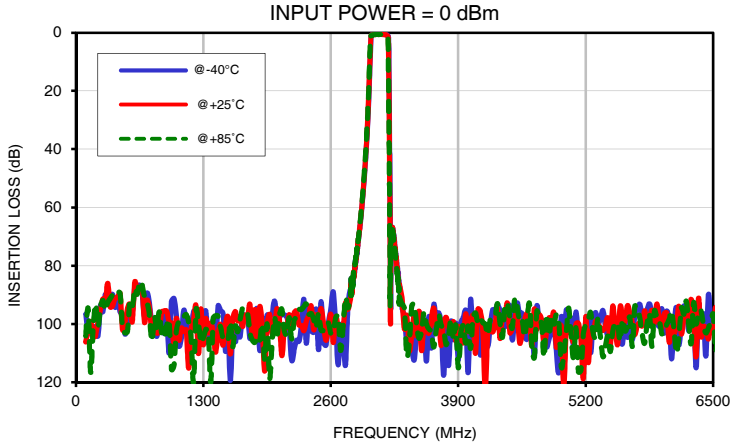
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	96.65	106.15	104.08	0.03	0.04	0.04	0.02	0.02	0.03
200	100.79	104.17	93.18	0.04	0.05	0.05	0.03	0.04	0.04
300	89.84	91.58	95.28	0.04	0.05	0.06	0.03	0.04	0.05
400	94.30	91.04	90.58	0.05	0.06	0.06	0.03	0.04	0.05
500	103.38	99.67	103.07	0.05	0.06	0.07	0.04	0.05	0.06
600	87.45	85.63	87.93	0.06	0.07	0.08	0.04	0.06	0.07
700	97.39	99.49	90.70	0.06	0.08	0.09	0.05	0.07	0.08
800	101.26	100.60	97.54	0.06	0.08	0.09	0.05	0.07	0.08
900	103.26	95.54	104.78	0.06	0.08	0.09	0.05	0.07	0.09
1000	91.20	107.00	114.36	0.06	0.08	0.09	0.05	0.07	0.09
1100	95.34	102.58	97.57	0.05	0.07	0.09	0.04	0.06	0.08
1200	95.65	98.87	120.16	0.04	0.07	0.08	0.04	0.07	0.09
1300	96.81	107.12	104.60	0.04	0.07	0.09	0.04	0.07	0.09
1400	98.66	102.61	98.02	0.04	0.06	0.09	0.03	0.06	0.09
1500	96.34	107.29	104.80	0.04	0.06	0.09	0.03	0.07	0.09
1600	102.75	98.11	107.80	0.04	0.07	0.09	0.03	0.07	0.10
1700	96.81	100.90	94.54	0.04	0.07	0.10	0.03	0.07	0.10
1800	100.14	104.93	105.54	0.03	0.06	0.09	0.03	0.07	0.10
1900	98.00	100.71	100.12	0.03	0.07	0.10	0.03	0.07	0.10
2000	96.70	103.40	107.18	0.03	0.07	0.10	0.03	0.07	0.11
2100	96.62	110.85	94.92	0.03	0.07	0.11	0.02	0.07	0.11
2200	112.41	100.96	105.12	0.03	0.07	0.10	0.02	0.07	0.11
2300	100.08	100.45	95.01	0.03	0.07	0.11	0.02	0.07	0.12
2400	102.11	93.82	96.39	0.05	0.09	0.13	0.03	0.08	0.13
2500	92.35	94.65	102.13	0.04	0.09	0.13	0.03	0.08	0.13
2600	94.82	96.68	103.29	0.05	0.09	0.13	0.03	0.08	0.13
2900	65.70	65.11	64.60	0.11	0.15	0.19	0.07	0.12	0.17
2960	40.69	39.66	38.29	0.18	0.22	0.26	0.14	0.19	0.23
2974	32.30	30.96	29.19	0.23	0.28	0.33	0.19	0.24	0.29
2990	20.21	18.23	15.66	0.40	0.50	0.67	0.36	0.46	0.62
2998	12.64	10.23	7.26	0.81	1.19	2.04	0.77	1.14	2.00
3005	5.51	3.45	1.83	2.67	4.76	9.56	2.63	4.73	9.59
3020	0.69	0.73	0.76	21.47	20.25	21.84	21.69	20.06	21.23
3040	0.52	0.59	0.67	23.59	20.15	18.49	23.52	20.19	18.51
3060	0.44	0.50	0.57	45.07	31.92	25.77	41.55	30.85	25.25
3080	0.44	0.51	0.58	23.52	22.01	21.31	23.86	22.19	21.36
3100	0.44	0.50	0.57	24.56	24.13	23.48	24.88	24.38	23.75
3120	0.44	0.51	0.58	29.96	28.69	27.82	30.11	28.76	27.80
3140	0.48	0.55	0.62	25.43	28.95	34.43	26.02	29.70	34.77
3150	0.51	0.59	0.68	32.71	29.10	28.11	29.73	27.74	27.49
3170	0.67	0.79	0.97	33.15	25.16	20.67	38.87	25.38	20.48
3180	0.93	1.10	1.51	20.16	35.05	21.61	19.98	30.99	21.02
3187	1.42	2.76	11.63	25.18	12.27	2.16	23.63	11.41	2.02
3190	3.08	10.98	23.14	9.81	2.18	0.97	9.26	2.03	0.90
3193	12.29	22.63	34.27	1.78	0.92	0.69	1.66	0.85	0.65
3195	20.18	30.15	41.78	0.97	0.70	0.59	0.89	0.65	0.56
3198	31.56	41.41	54.12	0.61	0.53	0.50	0.57	0.50	0.48
3210	94.91	84.75	73.27	0.29	0.31	0.34	0.28	0.31	0.35
3300	86.56	86.54	90.75	0.10	0.15	0.21	0.09	0.16	0.22
3400	100.12	109.04	106.41	0.09	0.14	0.20	0.07	0.13	0.20
3500	95.80	95.61	104.93	0.10	0.15	0.20	0.07	0.14	0.20
3600	97.43	103.14	101.69	0.09	0.15	0.20	0.06	0.13	0.20
3700	96.15	99.04	96.88	0.09	0.15	0.20	0.06	0.12	0.19
3800	114.27	100.83	103.92	0.09	0.14	0.20	0.06	0.12	0.19
3900	112.21	100.80	115.06	0.10	0.15	0.20	0.06	0.12	0.18
4000	116.73	102.68	100.67	0.10	0.16	0.21	0.06	0.12	0.18
4500	92.74	95.86	93.96	0.11	0.16	0.21	0.05	0.11	0.17
5000	95.28	102.39	103.14	0.12	0.17	0.22	0.04	0.11	0.17
5500	101.94	101.56	99.73	0.11	0.16	0.20	0.01	0.06	0.12
6500	100.55	102.74	96.72	0.07	0.13	0.18	0.10	0.02	0.05

Typical Performance Data

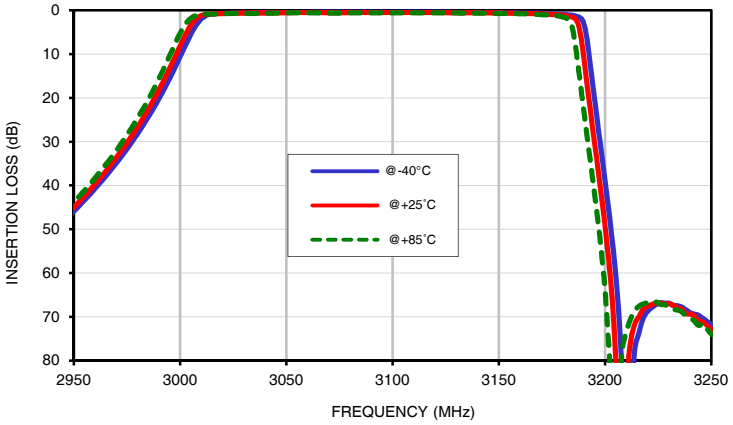
FREQ.	GROUP DELAY		
	(nsec)		
(MHz)	@-40°C	@+25°C	@+85°C
3020	18.43	17.36	15.98
3024	16.40	15.82	15.01
3028	15.22	14.86	14.24
3032	14.41	14.12	13.57
3036	13.75	13.49	13.02
3040	13.20	12.98	12.62
3044	12.75	12.59	12.35
3048	12.44	12.33	12.17
3052	12.20	12.13	12.02
3056	12.01	11.96	11.86
3060	11.85	11.80	11.70
3064	11.69	11.64	11.53
3068	11.55	11.50	11.40
3072	11.44	11.40	11.33
3076	11.37	11.35	11.32
3080	11.35	11.35	11.35
3084	11.36	11.37	11.42
3088	11.39	11.41	11.48
3092	11.42	11.46	11.54
3096	11.46	11.51	11.60
3100	11.51	11.56	11.67
3104	11.59	11.65	11.77
3108	11.71	11.78	11.92
3112	11.87	11.95	12.12
3116	12.05	12.15	12.36
3120	12.28	12.40	12.63
3124	12.53	12.66	12.94
3128	12.80	12.96	13.28
3132	13.11	13.29	13.68
3136	13.47	13.69	14.14
3140	13.92	14.17	14.70
3144	14.45	14.73	15.34
3148	15.07	15.39	16.10
3152	15.78	16.16	17.04
3156	16.59	17.08	18.22
3160	17.63	18.27	19.74
3164	19.00	19.83	21.68
3168	20.80	21.83	24.24
3172	23.08	24.44	28.12
3176	26.21	28.37	34.63
3180	31.27	35.09	49.05

Typical Performance Curves

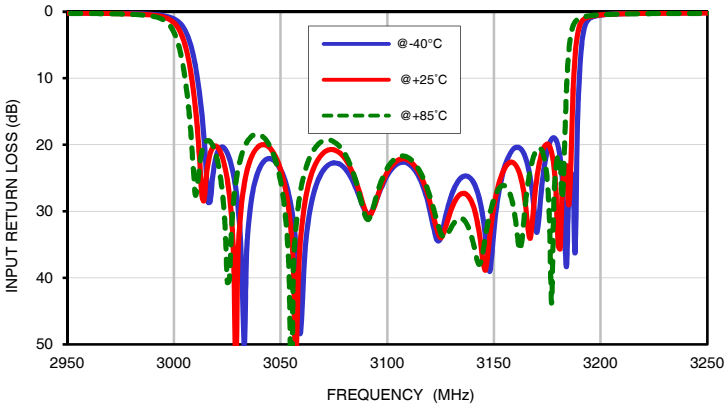
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



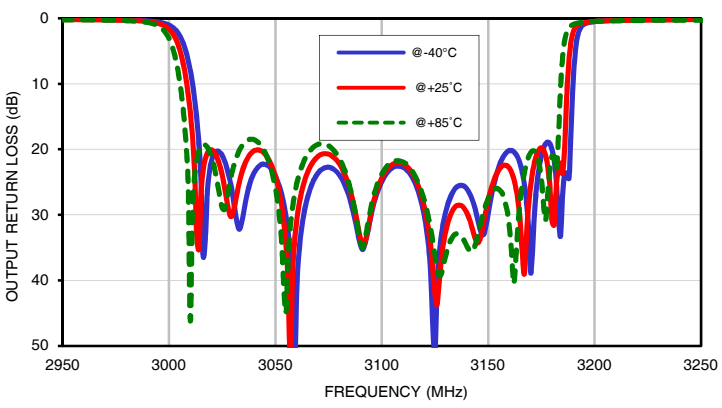
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



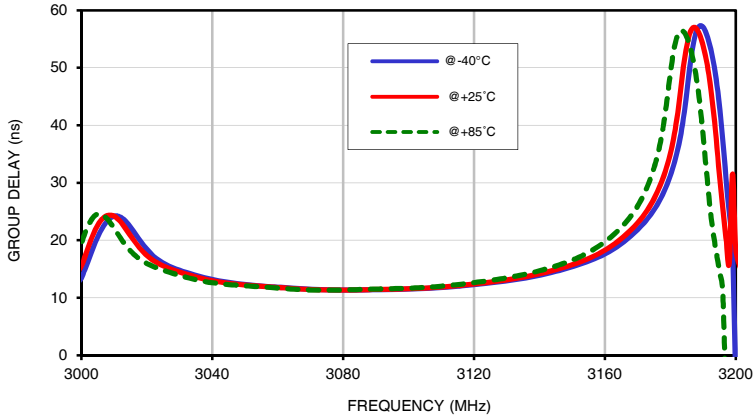
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



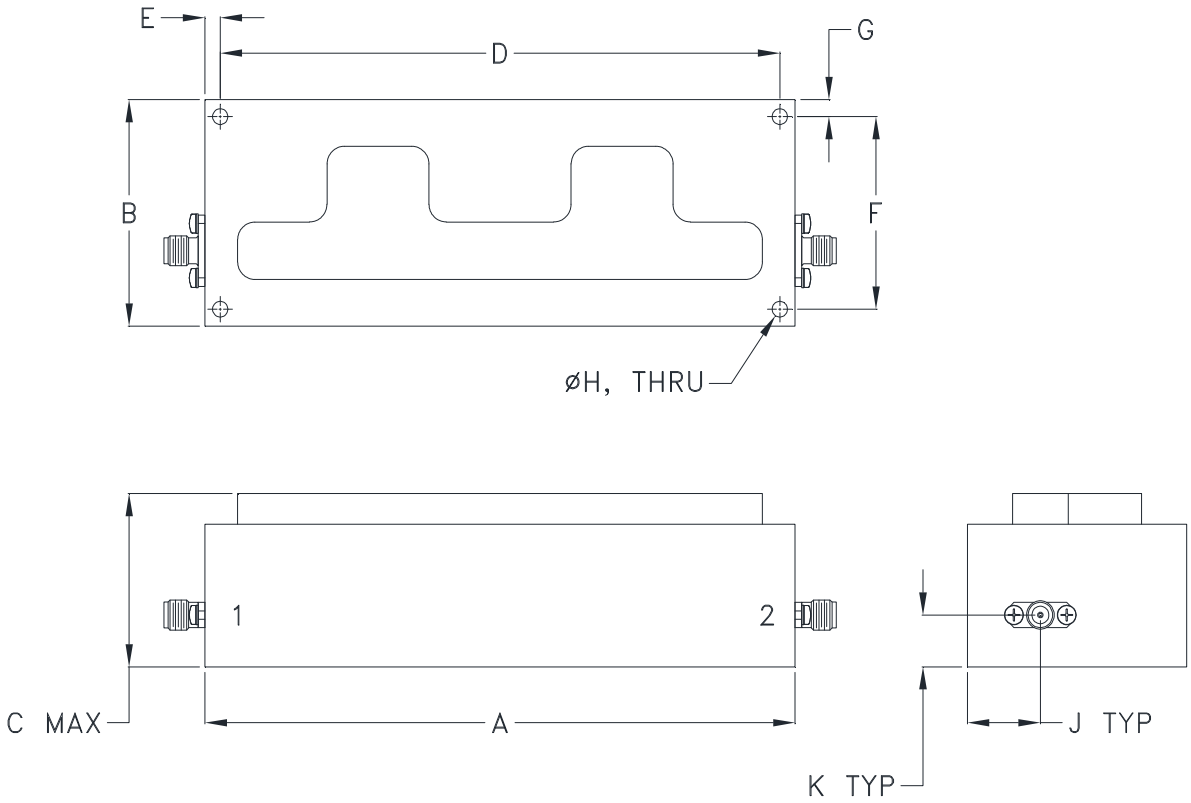
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style YK

Outline Dimensions

YK3431



CASE#	A	B	C	D	E	F
YK3431	5.38 (136.7)	2.00 (50.8)	1.53 (38.9)	5.100 (129.54)	.14 (3.6)	1.700 (43.18)

CASE#	G	H	J	K	WT. GRAMS
YK3431	.15 (3.8)	.140 (3.55)	.67 (16.9)	.46 (11.6)	483

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

Notes:

1. Case material: Aluminum
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