Cavity

Bandpass Filters

50Ω DC to 50 GHz

The Big Deal

- Very low insertion loss with excellent power handling
- Very fast roll-off with wide stopband
- Passbands up to 36 GHz
- Stopbands up to 50 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 1% 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-7100-S+

50Ω 7025 to 7175 MHz

Generic photo used for illustration purposes only

CASE STYLE: SK2596

Connectors	Model
SMA-F	ZVBP-7100-S+

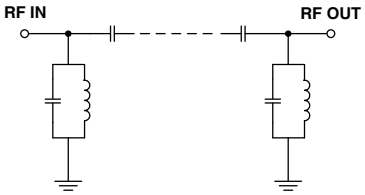
Features

- Narrow band width
- Good VSWR, 1.29:1 typical
- High rejection
- Broad stopband performance up to 14 GHz
- Fast roll-off

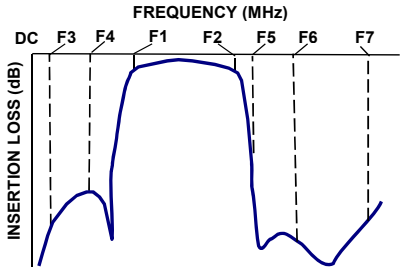
Applications

- Fixed and mobile communication network
- Satellite communication
- Test and measurements

Functional Schematic



Typical Frequency Response



+RoHS Compliant

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

Electrical Specifications at 25°C

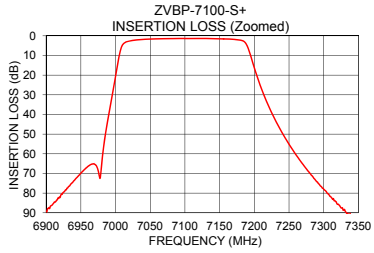
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	7100	-	MHz
	Insertion Loss	F1-F2	7025 - 7175	-	3.0	3.5	dB
	VSWR	F1-F2	7025 - 7175	-	1.29	1.5	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 6910	70	80	-	dB
		F3-F4	6910 - 6990	-	36	-	dB
	VSWR	DC-F4	DC - 6990	-	20	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	7224 - 7385	-	35	-	dB
		F6-F7	7385 - 14000	70	80	-	dB
	VSWR	F5-F7	7224 - 14000	-	20	-	:1

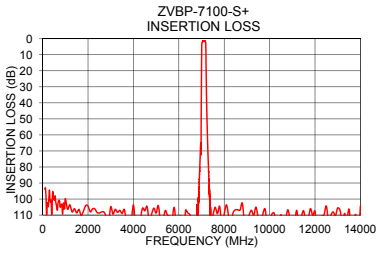
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	3W Max.

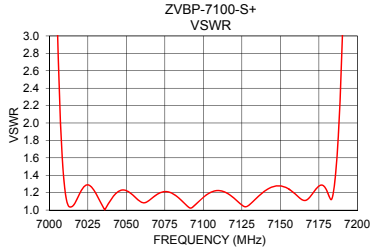
Permanent damage may occur if any of these limits are exceeded.
Input and output ports are DC short to ground.

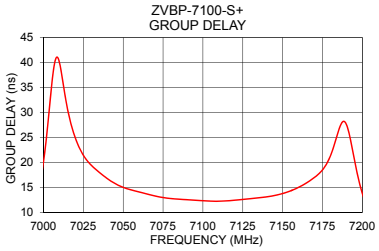
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
100	93.76	868.59	7025	21.47
2000	104.37	157.93	7040	16.81
6910	85.42	86.86	7030	19.46
6990	40.49	20.22	7040	16.81
6993	34.59	17.22	7050	15.05
6994	32.63	16.11	7060	14.13
6999	22.67	10.75	7100	12.38
7005	10.64	4.14	7080	12.81
7015	3.17	1.09	7090	12.58
7025	2.36	1.30	7100	12.38
7100	1.39	1.20	7110	12.28
7175	2.00	1.30	7120	12.48
7188	4.01	2.03	7130	12.80
7200	16.28	11.31	7140	13.16
7206	22.73	16.41	7150	13.82
7216	32.00	23.18	7160	15.05
7224	38.38	28.03	7165	15.94
7385	105.78	115.81	7168	16.57
10000	114.97	124.09	7170	17.04
14000	104.63	96.51	7175	18.54









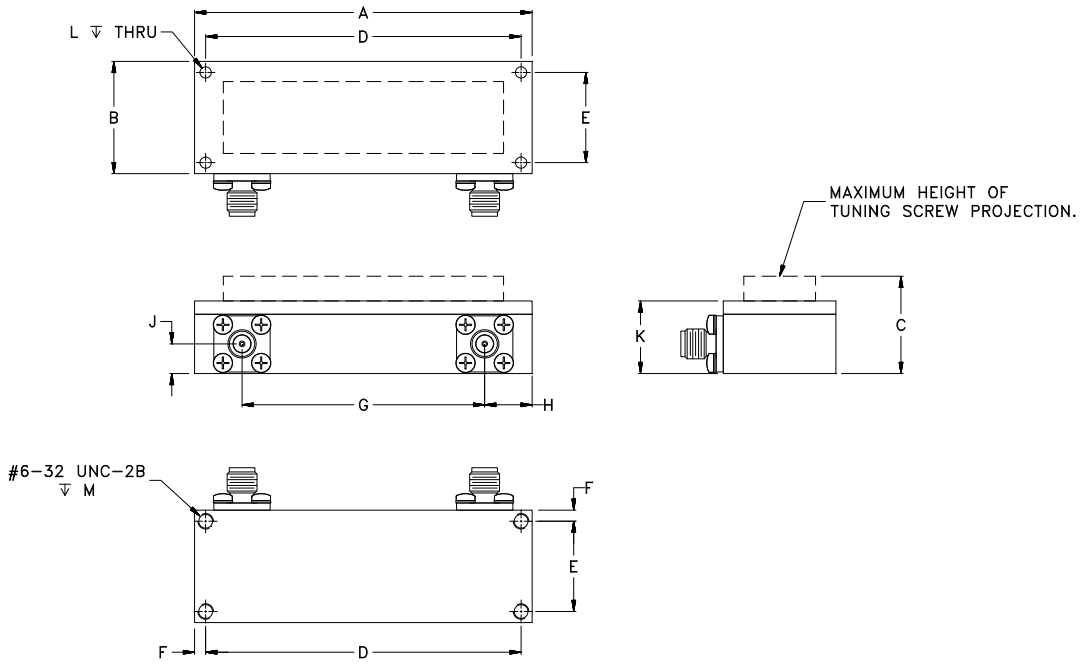
Notes

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

Coaxial Connections

PORT 1	SMA-FEMALE
PORT 2	SMA-FEMALE

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
3.00	**1.00**	**.87**	**2.803**	**.803**	**.10**	**2.16**
76.20	25.40	22.00	71.20	20.40	2.50	54.76

H	J	K	L	M		Wt.
.42	**.26**	**.67**	**.100**	**.276**		grams
10.72	6.70	17.00	2.54	7.00		250

Note: Please refer to case style drawing for details

Cavity Band Pass Filter ZVBP-7100-S+

Typical Performance Data

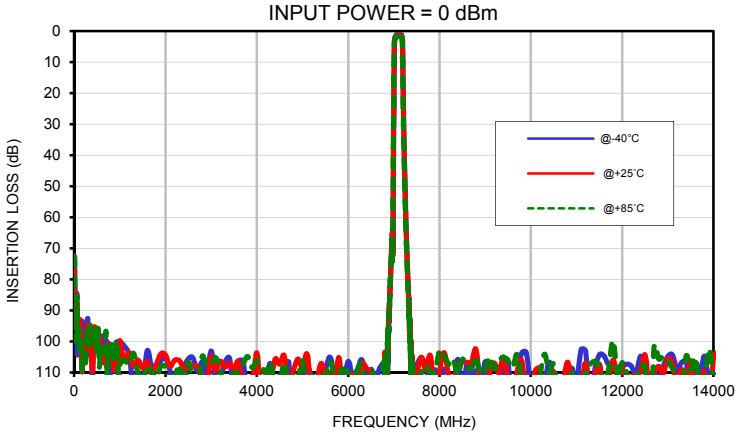
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100.0	97.39	93.76	95.55	0.03	0.00	0.03	0.02	0.02	0.03
150.0	100.21	99.20	99.54	0.02	0.02	0.02	0.02	0.03	0.03
200.0	102.80	102.32	104.55	0.01	0.04	0.02	0.05	0.05	0.05
250.0	97.27	104.76	107.61	0.09	0.10	0.10	0.06	0.06	0.06
300.0	92.85	94.40	101.16	0.02	0.06	0.03	0.07	0.08	0.08
500.0	101.72	99.29	101.00	0.06	0.10	0.09	0.08	0.10	0.11
750.0	100.75	101.67	104.29	0.06	0.11	0.11	0.09	0.12	0.13
1000.0	100.50	99.75	107.52	0.06	0.12	0.11	0.10	0.13	0.15
1500.0	114.44	108.67	113.46	0.04	0.11	0.12	0.08	0.12	0.14
2000.0	105.38	104.37	108.28	0.02	0.10	0.11	0.06	0.11	0.13
2500.0	105.60	108.74	106.80	0.01	0.08	0.10	0.03	0.10	0.13
3000.0	103.11	104.78	107.30	0.05	0.06	0.09	0.01	0.10	0.13
3500.0	116.08	108.94	110.47	0.07	0.05	0.10	0.00	0.09	0.15
4000.0	117.38	103.68	106.39	0.07	0.06	0.12	0.02	0.09	0.15
4500.0	111.27	107.37	115.07	0.06	0.08	0.14	0.00	0.11	0.17
5000.0	112.02	108.76	106.29	0.04	0.10	0.15	0.02	0.13	0.18
5200.0	111.08	115.56	111.41	0.03	0.11	0.16	0.02	0.12	0.18
5500.0	109.27	110.11	111.37	0.02	0.12	0.16	0.02	0.13	0.18
6000.0	106.48	111.15	110.60	0.00	0.13	0.16	0.04	0.13	0.16
6500.0	109.01	109.96	109.36	0.00	0.13	0.15	0.01	0.10	0.12
6900.0	90.10	89.29	89.39	0.05	0.21	0.24	0.07	0.18	0.22
6910.0	86.55	85.42	84.76	0.05	0.21	0.25	0.08	0.20	0.23
6990.0	51.28	40.49	33.15	0.54	0.97	1.35	0.53	0.86	1.21
6992.5	45.53	35.57	28.38	0.63	1.14	1.64	0.59	0.98	1.44
6993.0	44.45	34.59	27.41	0.65	1.18	1.71	0.61	1.01	1.49
6994.0	42.33	32.63	25.46	0.70	1.27	1.87	0.65	1.08	1.63
6999.0	32.19	22.67	15.47	1.03	2.02	3.54	0.89	1.62	2.97
7000.0	30.18	20.62	13.51	1.13	2.28	4.23	0.96	1.82	3.54
7005.0	19.94	10.64	6.02	2.04	5.48	13.63	1.64	4.28	10.96
7015.0	4.20	3.17	2.99	18.22	33.50	25.43	15.41	27.10	24.34
7025.0	2.37	2.36	2.39	18.85	17.96	20.76	17.68	17.64	19.22
7100.0	1.16	1.39	1.53	28.56	23.32	23.85	24.46	20.77	20.89
7175.0	1.59	2.00	2.37	21.06	18.35	18.52	18.91	17.64	17.35
7188.0	2.25	4.01	6.85	26.22	9.69	5.22	19.47	9.37	4.97
7200.0	10.55	16.28	20.22	2.14	1.37	1.22	2.27	1.54	1.38
7206.0	17.47	22.73	26.27	0.98	0.89	0.89	1.15	1.06	1.07
7216.0	27.61	32.00	35.00	0.49	0.59	0.64	0.65	0.75	0.82
7220.0	31.16	35.29	38.12	0.40	0.53	0.59	0.57	0.68	0.76
7224.0	34.48	38.38	41.07	0.34	0.48	0.54	0.50	0.62	0.70
7250.0	52.21	55.12	57.16	0.17	0.32	0.38	0.27	0.40	0.48
7300.0	75.98	78.02	79.70	0.08	0.22	0.25	0.13	0.25	0.30
7320.0	83.47	85.71	86.90	0.07	0.21	0.24	0.10	0.21	0.27
7350.0	93.85	96.16	96.64	0.03	0.18	0.21	0.07	0.18	0.22
7385.0	102.24	105.78	122.19	0.04	0.18	0.20	0.05	0.15	0.20
7400.0	123.16	115.75	107.08	0.03	0.16	0.19	0.03	0.14	0.19
7500.0	108.08	110.50	112.14	0.00	0.14	0.16	0.01	0.12	0.15
8000.0	112.96	109.47	103.04	0.06	0.10	0.12	0.03	0.09	0.11
8500.0	116.77	106.67	105.75	0.11	0.07	0.11	0.06	0.08	0.11
9000.0	106.57	118.08	109.28	0.14	0.06	0.11	0.05	0.09	0.14
9200.0	112.43	107.01	108.94	0.13	0.06	0.13	0.06	0.08	0.13
9500.0	106.34	112.17	106.32	0.15	0.07	0.16	0.04	0.11	0.18
10000.0	114.41	114.97	117.79	0.16	0.07	0.19	0.02	0.14	0.23
10500.0	112.15	109.75	107.40	0.16	0.10	0.23	0.00	0.17	0.28
11000.0	113.11	114.47	120.47	0.14	0.12	0.27	0.02	0.22	0.34
11500.0	104.32	107.36	108.38	0.16	0.12	0.29	0.03	0.24	0.37
12000.0	108.23	107.64	106.85	0.13	0.15	0.30	0.01	0.26	0.39
12500.0	108.87	104.36	108.26	0.13	0.15	0.29	0.02	0.25	0.39
13000.0	104.82	105.55	106.39	0.15	0.14	0.27	0.04	0.24	0.38
13500.0	117.11	106.33	109.26	0.16	0.11	0.24	0.06	0.21	0.36
14000.0	111.14	104.63	111.79	0.19	0.05	0.15	0.10	0.18	0.34

Typical Performance Data

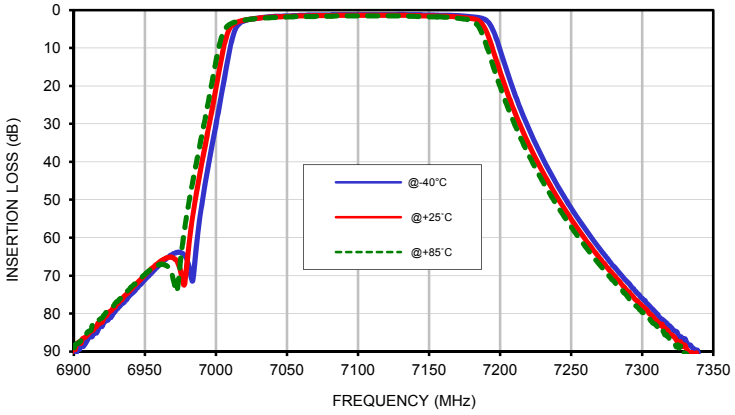
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
7025	24.70	21.47	19.91
7029	21.87	19.79	18.64
7033	20.09	18.58	17.58
7037	18.84	17.54	16.64
7041	17.75	16.59	15.84
7045	16.75	15.79	15.22
7049	15.89	15.18	14.77
7053	15.25	14.72	14.41
7057	14.79	14.37	14.09
7061	14.45	14.05	13.76
7065	14.12	13.72	13.43
7069	13.78	13.40	13.13
7073	13.46	13.12	12.91
7077	13.18	12.92	12.76
7081	12.96	12.78	12.67
7085	12.80	12.68	12.60
7089	12.70	12.60	12.53
7093	12.63	12.52	12.46
7097	12.55	12.44	12.39
7100	12.48	12.38	12.36
7105	12.36	12.30	12.33
7109	12.28	12.27	12.35
7113	12.26	12.32	12.43
7117	12.28	12.40	12.52
7121	12.36	12.51	12.63
7125	12.48	12.64	12.75
7129	12.62	12.77	12.87
7133	12.77	12.89	13.00
7137	12.88	13.03	13.17
7141	13.00	13.20	13.39
7145	13.16	13.43	13.69
7149	13.37	13.73	14.07
7153	13.66	14.12	14.56
7157	14.02	14.61	15.16
7161	14.49	15.22	15.88
7165	15.08	15.94	16.71
7169	15.79	16.80	17.72
7170	15.99	17.04	18.02
7173	16.62	17.85	19.18
7174	16.85	18.18	19.68
7175	17.09	18.54	20.26

Typical Performance Curves

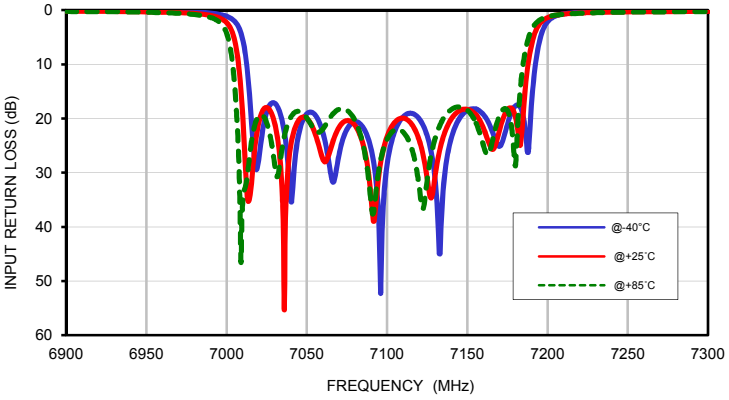
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



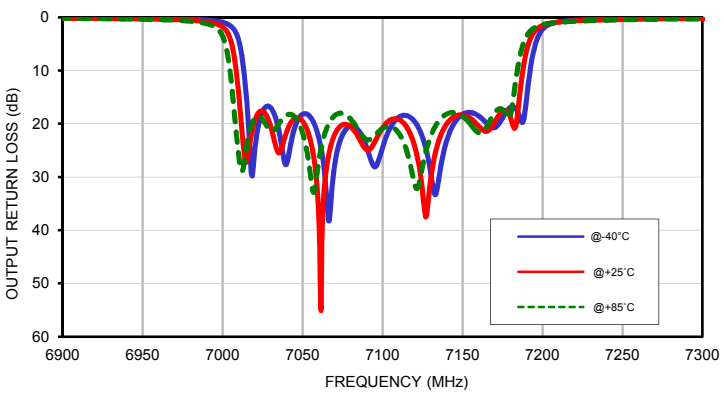
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



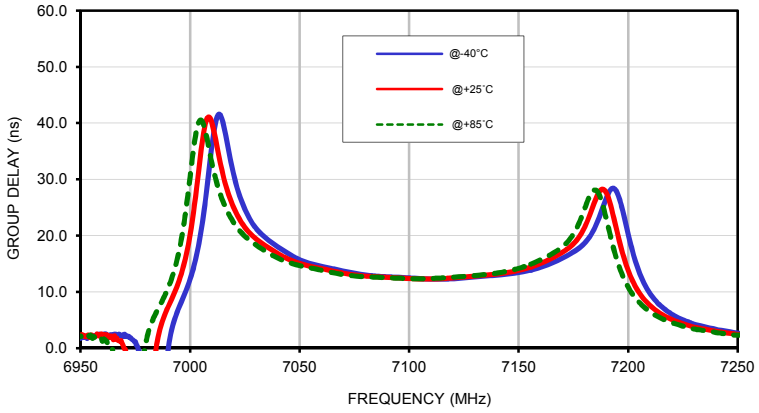
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



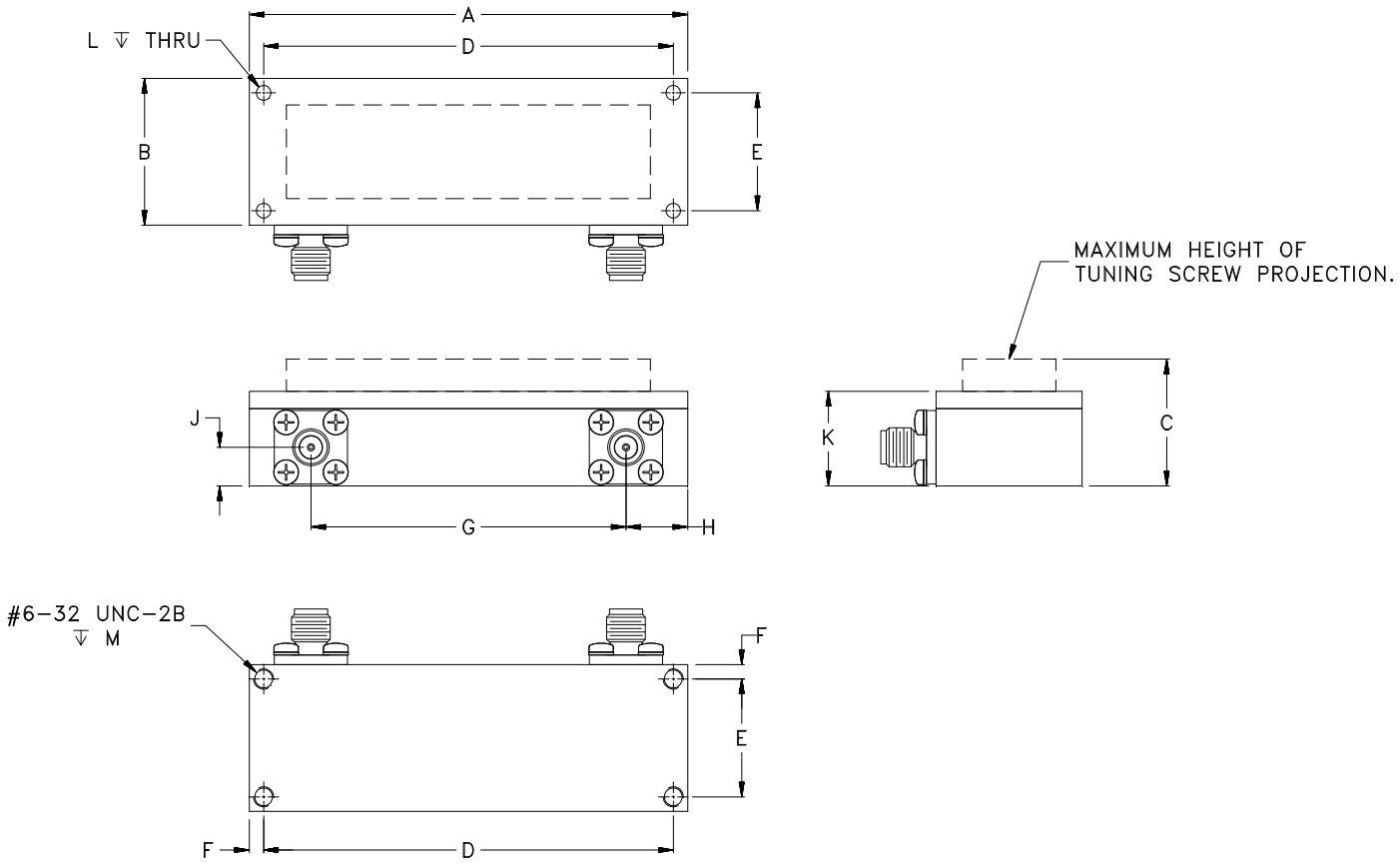
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style SK

Outline Dimensions

SK2596



CASE#	A	B	C (MAX)	D	E	F	G	H
SJ2566	3.00 (76.20)	1.00 (25.40)	.87 (22.00)	2.803 (71.20)	.803 (20.40)	.10 (2.50)	2.16 (54.76)	.42 (10.72)

CASE#	J	K	L	M	WT. GRAMS
SJ2566	.26 (6.70)	.67 (17.00)	.100 (2.54)	.276 (7.00)	250

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .10; 3 Pl. ± .015

Notes:

1. Case material: Brass & Aluminum alloy.
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