Cavity

Bandpass Filters

50Ω DC to 27.125 GHz

The Big Deal

- Very low insertion loss with excellent power handling
- Very fast roll-off with wide stopband
- Passbands up to 27.125 GHz
- Stopbands up to 37 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

Notes
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Cavity

Bandpass Filter

ZVBP-7558R7-S+

50Ω 7517.5 to 7600 MHz

Generic photo used for illustration purposes only

CASE STYLE: WE3301

Connectors	Model
SMA-F	ZVBP-7558R7-S+

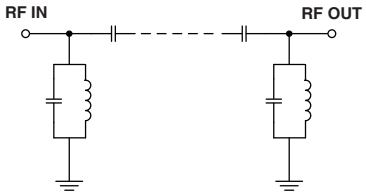
Features

- Low insertion loss,1.2 dB typ.
- Good VSWR, 1.2:1 typ.
- High rejection, 90dB typ.

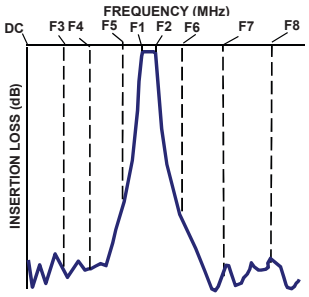
Applications

- Satellite communication
- Mobile communication
- Test and measurement

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	Fc	-	-	7558.7	-	MHz
	Insertion Loss	F1-F2	7517.5 - 7600	-	1.2	1.6	dB
	VSWR	F1-F2	7517.5 - 7600	-	1.18	1.43	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 6882	85	91	-	dB
		F4-F5	7000 - 7400	40	49	-	dB
Stop Band, Upper	Insertion Loss	F6-F7	7720 - 10600	40	50	-	dB
		F7-F8	10600 - 15000	85	93	-	dB

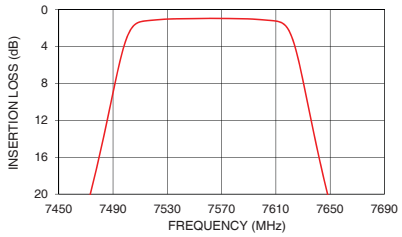
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10W max. @ 25°C

Permanent damage may occur if any of these limits are exceeded.

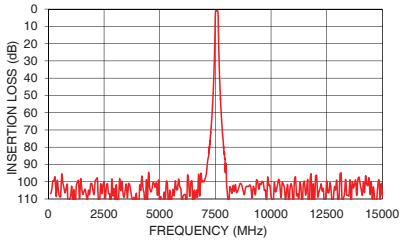
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
100.0	106.86	1411.19	7517.5	12.11
500.0	108.64	164.77	7521.0	11.48
5000.0	113.45	86.38	7525.0	10.99
6882.0	98.43	72.16	7529.0	10.63
7000.0	99.97	73.16	7533.0	10.32
7368.0	57.02	71.44	7537.5	10.03
7367.5	57.13	71.46	7541.0	9.84
7400.0	48.92	68.24	7545.0	9.68
7452.0	30.82	48.69	7549.0	9.57
7473.0	20.15	30.38	7553.0	9.51
7500.0	3.09	2.61	7558.7	9.48
7517.5	1.16	1.19	7561.0	9.48
7540.0	0.99	1.13	7565.0	9.50
7558.7	0.95	1.13	7569.5	9.54
7580.0	0.97	1.13	7573.0	9.60
7600.0	1.10	1.16	7577.0	9.71
7650.0	21.16	24.21	7581.0	9.87
7720.0	49.47	47.58	7585.0	10.08
10600.0	103.39	109.10	7589.0	10.35
15000.0	108.05	69.63	7600.0	11.36

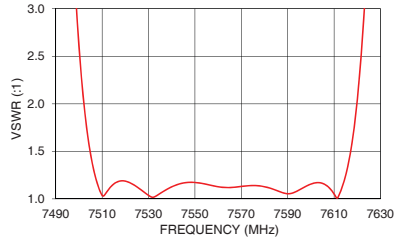
ZVBP-7558R7-S+
INSERTION LOSS (Zoomed)



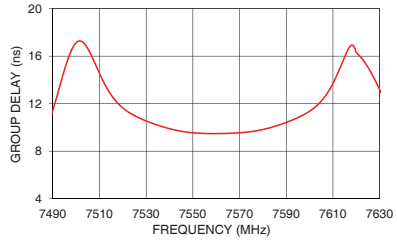
ZVBP-7558R7-S+
INSERTION LOSS



ZVBP-7558R7-S+
VSWR



ZVBP-7558R7-S+
GROUP DELAY



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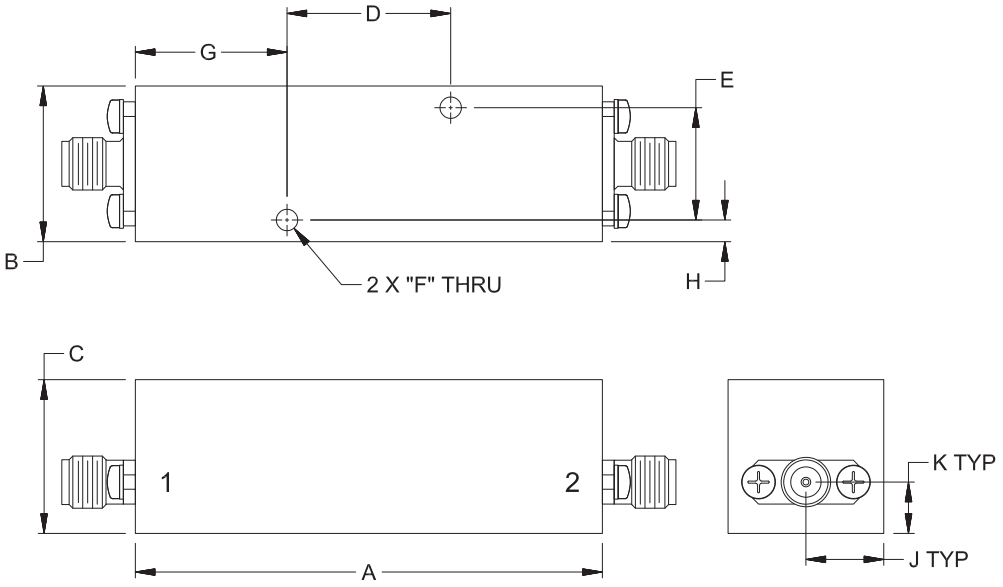
Coaxial Connections

PORT-1	SMA-Female
PORT-2	SMA-Female

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
2.37	**.79**	**.78**	**.830**	**.570**	**.110**
60.2	20.1	19.8	21.08	14.48	2.79
G	H	J	K		Wt.
.77	**.11**	**.40**	**.26**		grams
19.6	2.8	10.0	6.6		60

Note: Please refer to case style drawing for details

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Cavity Bandpass Filter ZVBP-7558R7-S+

Typical Performance Data

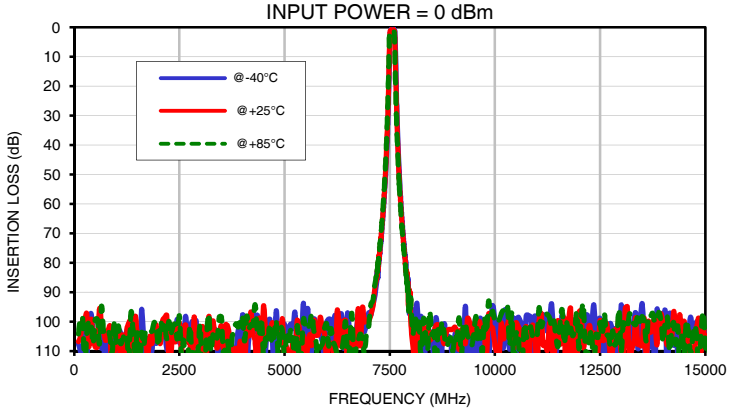
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100.0	107.63	106.86	104.20	0.00	0.01	0.01	0.00	0.01	0.02
200.0	111.78	99.55	98.82	0.04	0.05	0.06	0.03	0.04	0.05
500.0	107.29	108.64	99.28	0.08	0.11	0.12	0.09	0.10	0.12
1000.0	114.83	108.56	107.03	0.09	0.13	0.13	0.10	0.13	0.15
1500.0	104.65	104.18	103.97	0.06	0.11	0.12	0.07	0.11	0.14
2000.0	103.71	104.85	108.42	0.03	0.09	0.10	0.04	0.09	0.12
2500.0	107.17	100.44	98.07	0.00	0.08	0.10	0.02	0.07	0.12
3000.0	112.32	114.46	101.90	0.00	0.08	0.12	0.01	0.07	0.13
3500.0	108.35	101.46	98.45	0.01	0.10	0.15	0.02	0.09	0.16
4000.0	97.73	115.55	98.14	0.03	0.14	0.18	0.04	0.12	0.19
4500.0	116.25	94.70	111.29	0.06	0.16	0.21	0.08	0.15	0.22
5000.0	100.88	113.45	111.76	0.10	0.20	0.24	0.11	0.19	0.25
5500.0	111.23	112.54	102.53	0.13	0.23	0.26	0.14	0.21	0.27
6000.0	100.36	113.34	100.76	0.14	0.24	0.27	0.16	0.23	0.28
6500.0	97.03	117.56	111.95	0.16	0.25	0.27	0.17	0.24	0.28
6800.0	104.26	108.30	104.26	0.15	0.24	0.26	0.17	0.23	0.27
6882.0	101.42	98.43	109.71	0.14	0.24	0.25	0.17	0.23	0.27
6900.0	103.42	100.15	112.02	0.14	0.24	0.25	0.16	0.23	0.27
7000.0	97.05	99.97	101.70	0.14	0.24	0.24	0.16	0.23	0.27
7200.0	85.41	85.00	83.42	0.13	0.23	0.23	0.16	0.22	0.26
7367.5	58.69	57.13	55.45	0.14	0.24	0.25	0.16	0.23	0.27
7368.0	58.60	57.02	55.34	0.14	0.24	0.25	0.16	0.23	0.27
7400.0	50.88	48.92	46.85	0.14	0.25	0.27	0.17	0.25	0.30
7452.0	33.98	30.82	27.36	0.21	0.36	0.43	0.23	0.35	0.46
7473.0	24.37	20.15	15.38	0.32	0.57	0.91	0.34	0.57	0.93
7500.0	7.66	3.09	1.55	2.00	7.03	29.14	1.98	6.86	24.73
7517.5	1.19	1.16	1.22	21.15	21.35	21.63	19.73	21.23	21.15
7520.0	1.07	1.13	1.18	31.87	21.37	25.03	26.35	21.25	23.69
7530.0	0.91	1.02	1.12	26.68	34.78	25.06	26.44	29.22	23.73
7540.0	0.83	0.99	1.11	41.91	24.48	19.26	31.41	23.72	19.54
7558.7	0.78	0.95	1.07	25.84	24.05	22.74	26.60	26.77	27.32
7560.0	0.78	0.95	1.07	26.09	24.42	23.12	27.23	27.77	28.46
7570.0	0.78	0.95	1.08	24.53	24.22	24.97	26.91	27.93	31.22
7580.0	0.81	0.97	1.12	21.08	24.39	29.39	21.99	26.06	31.89
7600.0	0.84	1.10	1.34	29.88	22.80	42.20	27.49	21.90	29.63
7624.0	1.24	3.98	9.53	22.06	5.25	2.05	19.80	5.08	1.94
7650.0	15.79	21.16	25.61	0.78	0.72	0.71	0.76	0.67	0.67
7670.0	27.50	31.46	34.86	0.42	0.51	0.54	0.41	0.47	0.52
7720.0	46.99	49.47	51.64	0.26	0.37	0.40	0.27	0.34	0.40
8000.0	95.07	100.37	92.16	0.14	0.25	0.26	0.17	0.24	0.28
8200.0	106.32	104.04	99.88	0.12	0.23	0.24	0.15	0.23	0.26
8400.0	102.86	101.66	109.71	0.11	0.22	0.23	0.14	0.22	0.25
8600.0	98.65	101.28	118.00	0.10	0.21	0.22	0.13	0.21	0.24
8800.0	100.68	107.49	104.68	0.09	0.20	0.21	0.11	0.20	0.23
9000.0	114.99	102.63	110.03	0.08	0.20	0.20	0.11	0.19	0.23
9200.0	103.45	102.87	111.86	0.07	0.19	0.20	0.10	0.19	0.23
9400.0	101.13	100.06	105.77	0.06	0.18	0.19	0.08	0.18	0.22
9600.0	128.57	99.88	106.76	0.05	0.17	0.19	0.07	0.17	0.22
9800.0	106.55	112.28	103.80	0.05	0.17	0.19	0.06	0.17	0.22
10000.0	100.45	108.25	99.97	0.04	0.17	0.19	0.06	0.17	0.23
10200.0	109.09	105.76	96.13	0.03	0.16	0.20	0.05	0.16	0.23
10400.0	106.92	102.51	97.12	0.02	0.16	0.20	0.05	0.16	0.23
10600.0	99.59	103.39	116.24	0.02	0.16	0.21	0.04	0.16	0.24
10800.0	97.87	115.60	103.86	0.01	0.16	0.22	0.05	0.17	0.26
11000.0	109.13	116.80	105.54	0.01	0.16	0.22	0.04	0.17	0.27
11200.0	99.51	107.08	97.56	0.00	0.16	0.24	0.05	0.18	0.29
11400.0	106.31	114.39	99.67	0.00	0.17	0.25	0.05	0.19	0.30
12000.0	104.23	96.82	109.28	0.00	0.18	0.29	0.04	0.20	0.33
13000.0	94.66	111.23	110.35	0.01	0.22	0.36	0.05	0.23	0.39
15000.0	106.85	108.05	106.50	0.02	0.25	0.40	0.05	0.24	0.41

Typical Performance Data

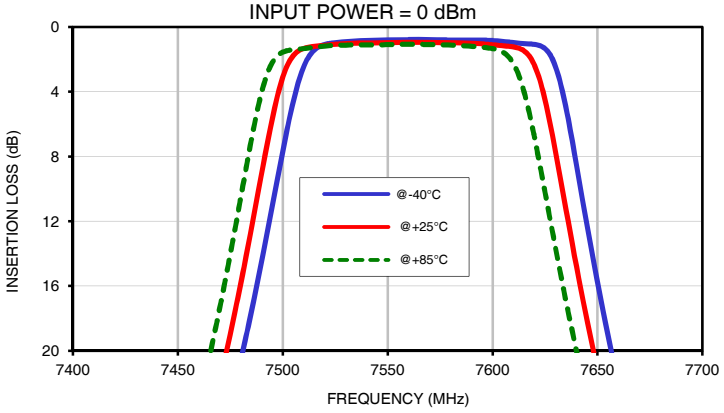
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
7517.5	14.96	12.11	10.91
7518.0	14.76	12.00	10.87
7519.0	14.36	11.81	10.79
7520.0	13.98	11.64	10.71
7521.0	13.62	11.48	10.63
7522.0	13.28	11.34	10.56
7523.0	12.97	11.22	10.49
7524.0	12.69	11.10	10.42
7525.0	12.43	10.99	10.35
7526.0	12.19	10.89	10.28
7527.0	11.98	10.80	10.22
7528.0	11.79	10.71	10.15
7529.0	11.61	10.63	10.09
7530.0	11.46	10.55	10.02
7531.0	11.31	10.47	9.96
7532.0	11.18	10.39	9.91
7533.0	11.06	10.32	9.85
7534.0	10.95	10.25	9.80
7535.0	10.84	10.19	9.75
7536.0	10.74	10.12	9.71
7537.0	10.65	10.06	9.67
7538.0	10.56	10.00	9.63
7539.0	10.48	9.94	9.60
7540.0	10.40	9.89	9.57
7541.0	10.33	9.84	9.54
7542.0	10.26	9.79	9.52
7543.0	10.19	9.75	9.50
7544.0	10.13	9.71	9.49
7550.0	9.81	9.55	9.46
7558.7	9.57	9.48	9.53
7559.0	9.56	9.48	9.53
7560.0	9.55	9.48	9.54
7561.0	9.53	9.48	9.56
7562.0	9.52	9.48	9.58
7563.0	9.51	9.49	9.60
7564.0	9.50	9.49	9.62
7565.0	9.50	9.50	9.64
7566.0	9.49	9.51	9.66
7580.0	9.53	9.82	10.30
7590.0	9.88	10.42	11.21
7600.0	10.56	11.36	13.28

Typical Performance Curves

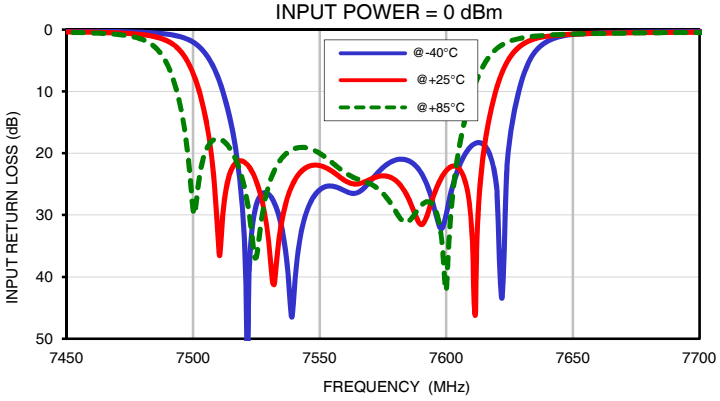
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



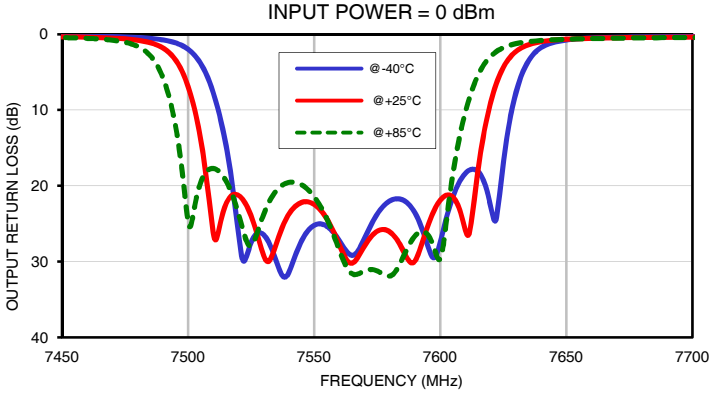
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



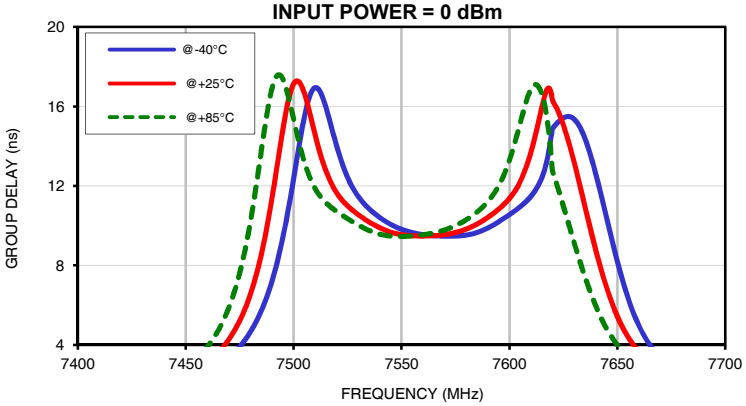
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



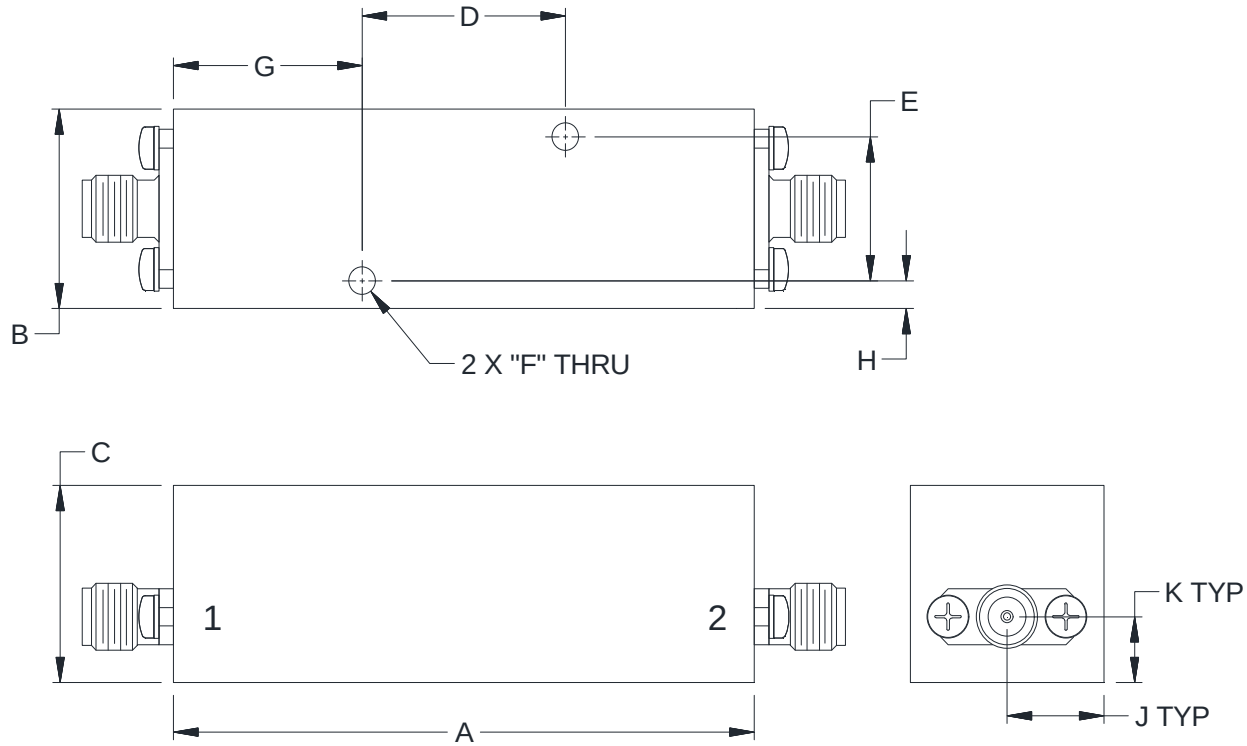
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style WE

Outline Dimensions

WE3301



CASE#	A	B	C	D	E	F
WE3301	2.37 (60.2)	.79 (20.1)	.78 (19.8)	.830 (21.08)	.570 (14.48)	.110 (2.79)

CASE#	G	H	J	K	WT. GRAMS
WE3301	.77 (19.6)	.11 (2.8)	.40 (10.0)	.26 (6.6)	60

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.

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RF/IF MICROWAVE COMPONENTS

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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

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