

# Coaxial Low Pass Filter

## VLF-8400+

50Ω DC to 8400 MHz

### The Big Deal

- Excellent power handling, 8W
- Temperature stable
- Rugged unibody construction



CASE STYLE: FF704

### Product Overview

VLF-8400+ is a 50Ω low pass filter built in rugged unibody construction. Covering DC-8400 MHz bandwidth, these units offer good matching within the passband and high rejection in stopband. VLF-8400+ offer low insertion loss, and excellent power handling capability.

### Key Features

Feature	Advantages
Low passband insertion loss	Suitable for high performance application
8W Power handling	Supports a range of system power requirements.
Connectorized package	The connectorized package is easy to interface with other devices and well suited for test setups

#### 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.  
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# Low Pass Filter

50Ω DC to 8400 MHz

## VLF-8400+



CASE STYLE: FF704

Connectors	Model
SMA	VLF-8400+

### Features

- Rugged uni-body construction, small size
- Excellent power handling, 8W
- Temperature stable
- Protected by US patent 6,943,646

### Applications

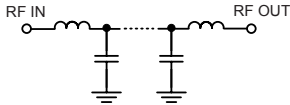
- Harmonic rejection
- VHF/UHF Transmitters / Receivers
- Lab use

### Electrical Specifications<sup>(1)</sup> at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
<b>Pass Band</b>	Insertion Loss	DC-F1	DC-8400	—	1.6	1.8	dB
	Freq. Cut-Off	F2	9100	—	3.0	—	dB
	VSWR	DC-F1	DC-8400	—	1.6	—	:1
<b>Stop Band</b>	Insertion Loss	F3	10300	18	20	—	dB
		F3-F4	10300-15000	—	30	—	dB
	VSWR	F3-F4	10300-15000	—	17	—	:1

<sup>(1)</sup> In Application where DC voltage is present at either input or output ports, coupling capacitors are required.

### Functional Schematic



### Maximum Ratings

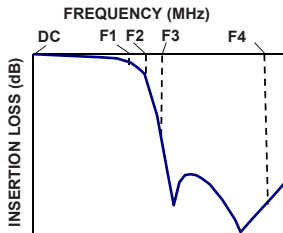
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	8W max. at 25°C

\*Passband rating derated linearly to 3W at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

### Typical Performance Data at 25°C

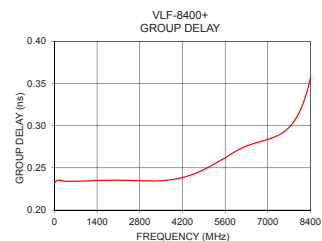
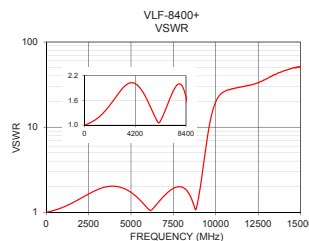
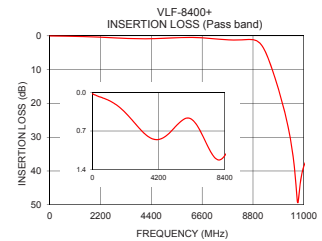
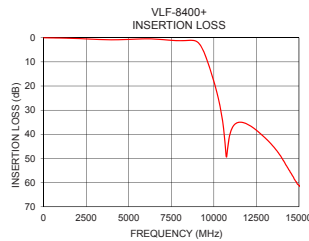
Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	0.02	1.00	10	0.23
100	0.04	1.01	100	0.24
500	0.08	1.06	500	0.23
1000	0.14	1.15	1000	0.23
2000	0.34	1.45	2000	0.24
4000	0.86	2.03	2500	0.23
8000	1.23	1.98	3000	0.23
8400	1.15	1.68	3500	0.23
9100	2.16	2.05	4000	0.24
9200	3.02	2.81	4500	0.24
9750	12.38	13.85	5000	0.25
10100	20.57	21.79	5500	0.26
10300	26.29	24.58	6000	0.27
10400	29.71	25.42	6500	0.28
11000	38.63	28.25	7000	0.28
11500	34.98	29.64	7500	0.29
12000	35.92	31.17	8000	0.31
13000	41.39	36.90	8100	0.32
14000	49.90	45.60	8200	0.33
15000	61.14	50.27	8400	0.36

### Typical Frequency Response



### +RoHS Compliant

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



### Notes

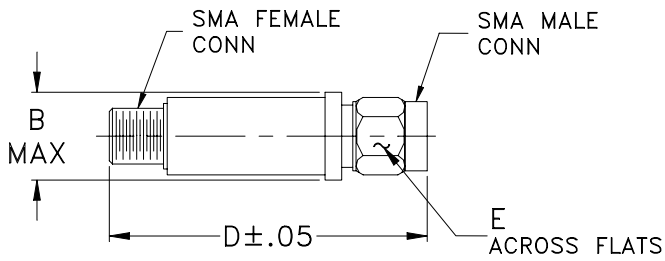
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## Coaxial Connections

INPUT	SMA-Female
OUTPUT	SMA-Male

## Outline Drawing



## Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

B	D	E	wt.
.410	1.43	.312	grams
10.41	36.32	7.92	10

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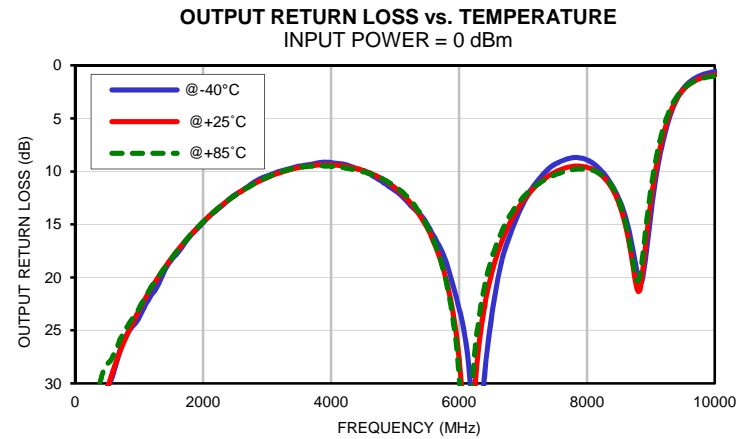
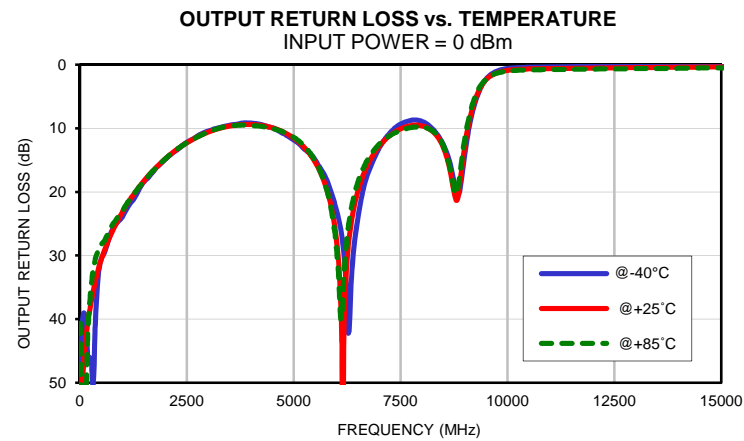
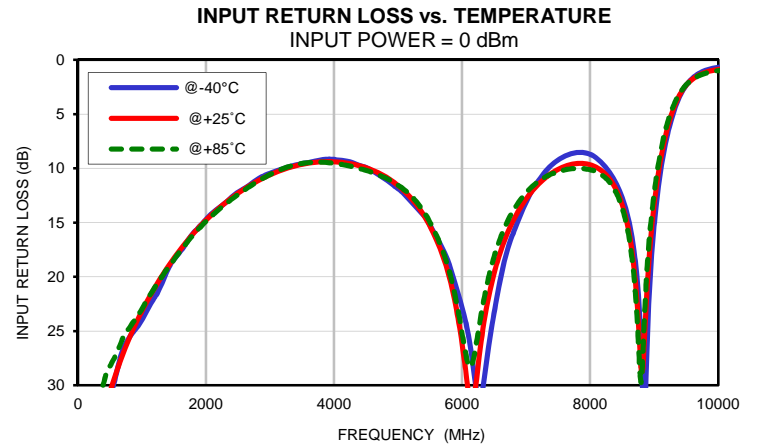
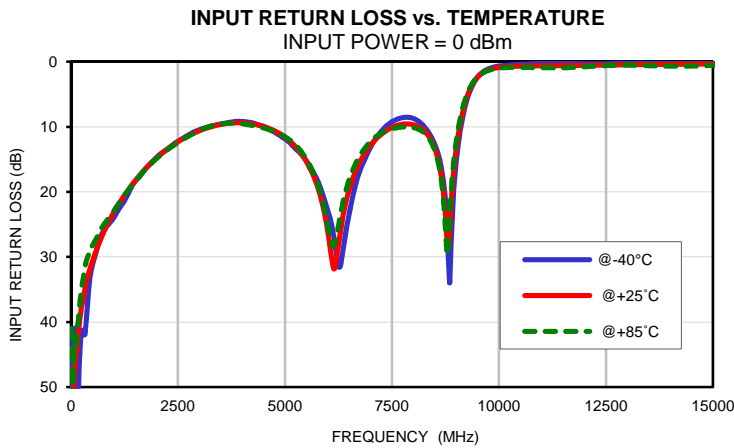
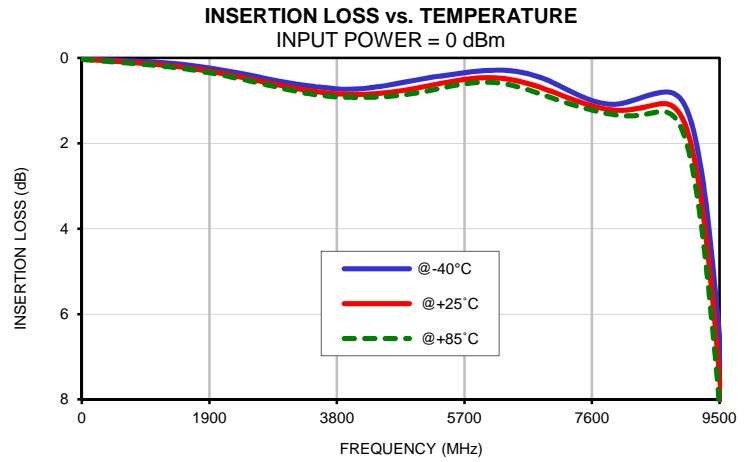
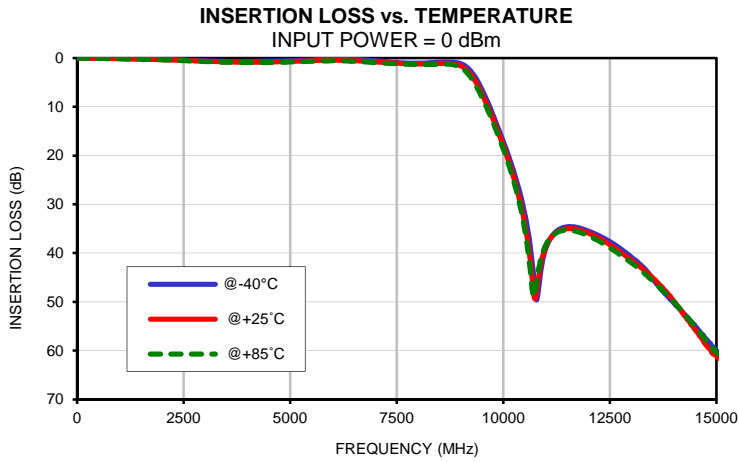
Typical Performance Data

FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	0.02	0.02	0.03	76.87	55.19	40.97	52.62	50.60	40.66
20	0.01	0.02	0.03	47.84	56.20	47.27	45.32	52.03	45.92
40	0.02	0.03	0.04	43.73	53.53	50.12	43.00	53.22	53.91
60	0.03	0.03	0.04	41.98	50.89	47.52	40.31	49.65	52.14
80	0.03	0.04	0.04	41.07	48.82	44.10	39.30	47.71	50.56
100	0.03	0.04	0.04	41.32	46.32	43.99	39.14	46.11	61.57
150	0.03	0.04	0.05	49.77	43.13	40.79	42.46	42.51	51.38
200	0.03	0.05	0.06	45.64	40.03	37.69	46.67	39.61	40.29
250	0.04	0.05	0.06	41.71	37.57	34.82	46.23	37.85	35.76
300	0.04	0.06	0.07	41.66	35.98	32.71	50.38	36.01	32.70
350	0.04	0.07	0.08	40.38	34.05	30.80	42.72	34.33	30.85
400	0.05	0.07	0.09	36.21	32.89	29.84	35.64	32.94	29.74
500	0.05	0.08	0.10	31.25	30.70	28.24	30.48	30.61	28.25
750	0.07	0.11	0.13	26.12	26.41	25.23	26.05	26.28	25.29
1000	0.09	0.14	0.16	23.99	23.16	22.98	23.80	23.08	22.93
1500	0.15	0.22	0.25	18.39	18.29	18.43	18.40	18.27	18.29
2000	0.26	0.34	0.38	14.72	14.78	14.89	14.84	14.78	14.76
4000	0.74	0.86	0.92	9.18	9.39	9.53	9.16	9.38	9.52
6000	0.30	0.46	0.57	22.85	26.13	25.22	22.93	27.55	29.04
7000	0.57	0.79	0.94	13.10	12.81	12.23	13.06	12.81	12.46
8000	1.08	1.23	1.35	8.70	9.66	10.11	8.90	9.61	9.79
8500	0.85	1.11	1.29	12.69	13.31	13.62	12.61	13.00	12.75
9000	1.16	1.61	1.94	15.32	13.38	12.29	14.00	12.75	11.65
9100	1.62	2.16	2.60	10.33	9.27	8.52	9.82	9.02	8.20
9200	2.35	3.02	3.57	7.10	6.47	5.99	6.88	6.36	5.79
9300	3.41	4.20	4.84	4.89	4.53	4.25	4.76	4.48	4.12
9500	6.51	7.39	8.12	2.34	2.34	2.31	2.22	2.33	2.23
9750	11.56	12.38	13.08	1.09	1.26	1.32	0.99	1.27	1.32
10000	17.16	18.06	18.73	0.68	0.87	0.98	0.59	0.88	0.99
10100	19.56	20.57	21.25	0.59	0.80	0.92	0.52	0.80	0.92
10200	22.15	23.29	24.03	0.53	0.75	0.88	0.46	0.74	0.88
10300	24.95	26.29	27.14	0.47	0.71	0.86	0.43	0.71	0.85
10400	28.12	29.71	30.72	0.42	0.68	0.85	0.41	0.68	0.82
10500	31.87	33.86	35.17	0.39	0.66	0.85	0.39	0.65	0.79
10600	36.61	39.40	41.32	0.36	0.65	0.87	0.38	0.64	0.78
10700	43.78	47.51	48.89	0.33	0.64	0.88	0.38	0.63	0.78
10800	48.90	46.48	44.66	0.31	0.63	0.89	0.36	0.62	0.77
10900	42.46	41.38	40.53	0.27	0.62	0.90	0.35	0.61	0.75
11000	38.97	38.63	38.23	0.25	0.62	0.91	0.35	0.60	0.74
11250	35.47	35.71	35.81	0.24	0.60	0.93	0.33	0.58	0.72
11500	34.61	34.98	35.31	0.25	0.59	0.91	0.29	0.56	0.71
11750	34.78	35.19	35.64	0.29	0.57	0.86	0.25	0.54	0.69
12000	35.48	35.92	36.45	0.32	0.56	0.77	0.22	0.52	0.67
12250	36.50	36.97	37.59	0.34	0.54	0.68	0.19	0.50	0.66
12500	37.67	38.30	38.92	0.34	0.52	0.59	0.17	0.48	0.64
12750	39.10	39.79	40.42	0.30	0.50	0.54	0.15	0.45	0.62
13000	40.77	41.39	41.99	0.21	0.47	0.53	0.13	0.44	0.60
13250	42.71	43.13	43.71	0.13	0.44	0.55	0.13	0.42	0.58
13500	45.23	45.08	45.70	0.06	0.42	0.60	0.13	0.41	0.57
13750	47.90	47.29	47.83	0.01	0.40	0.65	0.13	0.40	0.56
14000	50.25	49.90	50.03	0.00	0.38	0.68	0.12	0.39	0.54
14250	52.55	52.87	52.51	0.02	0.37	0.68	0.11	0.37	0.52
14300	53.04	53.42	53.01	0.02	0.36	0.68	0.12	0.37	0.53
14400	54.01	54.64	54.05	0.04	0.36	0.67	0.12	0.36	0.52
14500	55.09	55.76	55.07	0.05	0.35	0.65	0.11	0.35	0.50
14600	56.04	56.97	56.22	0.06	0.35	0.64	0.11	0.34	0.49
14700	57.01	58.13	57.30	0.08	0.35	0.63	0.12	0.34	0.48
14800	58.07	59.37	58.49	0.09	0.34	0.60	0.12	0.34	0.48
14900	59.15	60.52	59.52	0.11	0.34	0.58	0.11	0.34	0.48
15000	60.17	61.14	60.43	0.12	0.35	0.57	0.10	0.34	0.47

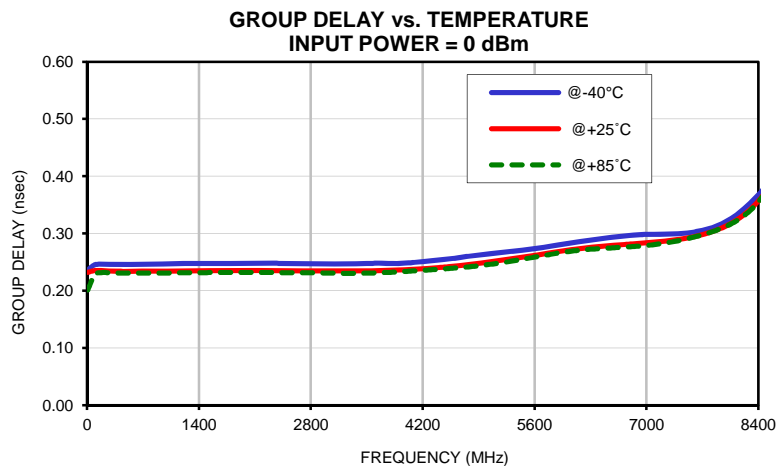
*Typical Performance Data*

FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
10	0.24	0.23	0.20
20	0.24	0.23	0.20
40	0.24	0.23	0.21
50	0.24	0.23	0.22
100	0.25	0.24	0.23
100	0.25	0.24	0.23
125	0.25	0.24	0.23
150	0.25	0.24	0.23
175	0.25	0.24	0.23
200	0.25	0.24	0.23
225	0.25	0.23	0.23
250	0.25	0.23	0.23
275	0.25	0.23	0.23
300	0.25	0.23	0.23
325	0.25	0.23	0.23
350	0.25	0.23	0.23
375	0.25	0.23	0.23
400	0.25	0.23	0.23
500	0.25	0.23	0.23
750	0.25	0.23	0.23
1000	0.25	0.23	0.23
1250	0.25	0.23	0.23
1500	0.25	0.23	0.23
1750	0.25	0.24	0.23
2000	0.25	0.24	0.23
2250	0.25	0.24	0.23
2500	0.25	0.23	0.23
2750	0.25	0.23	0.23
3000	0.25	0.23	0.23
3250	0.25	0.23	0.23
3500	0.25	0.23	0.23
3750	0.25	0.24	0.23
4000	0.25	0.24	0.23
4250	0.25	0.24	0.24
4500	0.26	0.24	0.24
4750	0.26	0.25	0.24
5000	0.26	0.25	0.25
5250	0.27	0.25	0.25
5500	0.27	0.26	0.26
5750	0.28	0.27	0.26
6000	0.28	0.27	0.27
6250	0.29	0.28	0.27
6500	0.29	0.28	0.27
6750	0.30	0.28	0.28
7000	0.30	0.28	0.28
7100	0.30	0.28	0.28
7200	0.30	0.29	0.28
7300	0.30	0.29	0.28
7400	0.30	0.29	0.29
7500	0.30	0.29	0.29
7600	0.30	0.29	0.29
7700	0.31	0.30	0.30
7800	0.31	0.30	0.30
7900	0.31	0.31	0.31
8000	0.32	0.31	0.31
8100	0.33	0.32	0.32
8200	0.34	0.33	0.33
8300	0.35	0.34	0.34
8350	0.36	0.35	0.35
8400	0.37	0.36	0.36

## Typical Performance Curves



## Typical Performance Curves

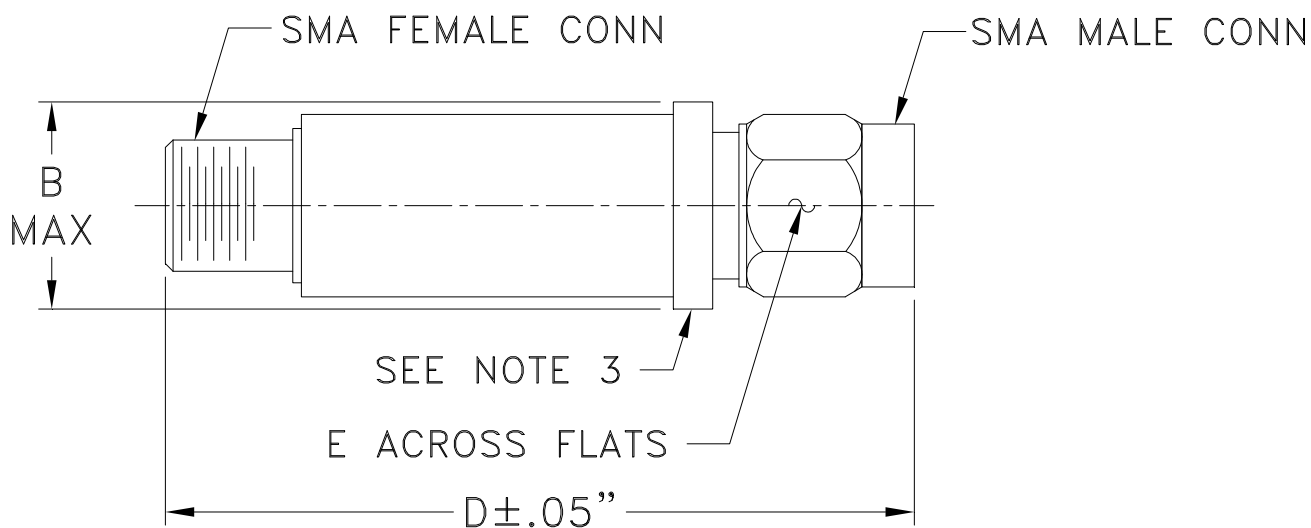


# Case Style

# FF

## FF704

### Outline Dimensions



CASE #.	A	B	C	D	E	WT GRAMS
FF704	--	.410 (10.41)	--	1.43 (36.32)	.312 (7.92)	10.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

#### Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have .312 Across Flats in some models.

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RF/IF MICROWAVE COMPONENTS



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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I