



Mini-Circuits

LTCC COAXIAL

Low Pass Filter

VLFG-510+

50 Ω

DC to 510 MHz SMA Male/Female

KEY FEATURES

- Low Insertion Loss, 1.1 dB Typ.
- Return Loss, 15 dB Typ.
- Stop Band Rejection, 50 dB Typ.
- Rugged unibody construction.
- Power Handling: 3.5 Watts

APPLICATIONS

- VHF/UHF Transmitters / Receivers
- Test and Measurement
- Aircraft Communication
- MRI

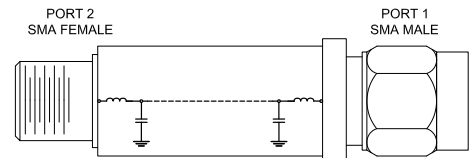


Generic photo used for illustration purposes only

PRODUCT OVERVIEW

VLFG-510+ is a Low Pass filter with DC to 510 MHz passband supporting a variety of applications. This model provides 1.1 dB typical insertion loss over a wide band due to its rugged unibody construction. VLFG-510+ offers low insertion loss, and excellent power handling capability. It handles up to 3.5W RF input power and provides a wide operating temperature range from -55°C to 125°C.

FUNCTIONAL DIAGRAM

ELECTRICAL SPECIFICATIONS^{1,2} AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Pass Band	Insertion Loss	DC-F1	DC- 510	—	1.1	2.0	dB
	Freq. Cut-Off ³	Fc ³	660	—	3	—	dB
	Return Loss	DC-F1	DC - 510	—	15	—	dB
Stop Band	Rejection	F2-F3	820 - 980	20	31	—	dB
		F3-F4	980 - 1500	40	50	—	
		F4-F5	1500 - 3000	—	44	—	
		F5-F6	3000 - 8500	—	19	—	

1. This filter is bi-directional, RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

3. Typical variation $\pm 5\%$

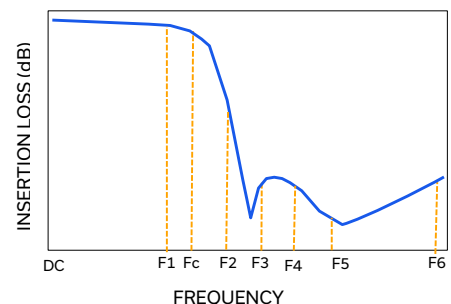
ABSOLUTE MAXIMUM RATINGS⁴

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power ⁵	3.5 W @25°C

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

5. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.9 W at +125°C.

TYPICAL FREQUENCY RESPONSE AT +25°C



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REV. OR
ECO-026012
VLFG-510+
EDU5144
URJ
250626

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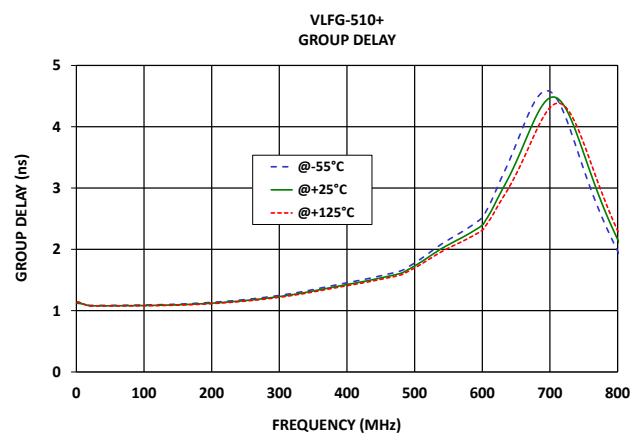
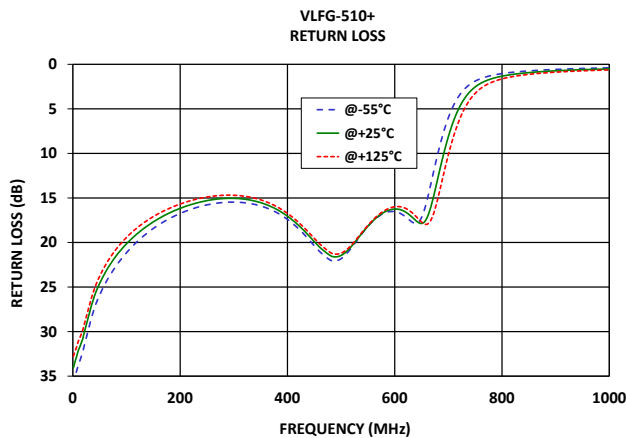
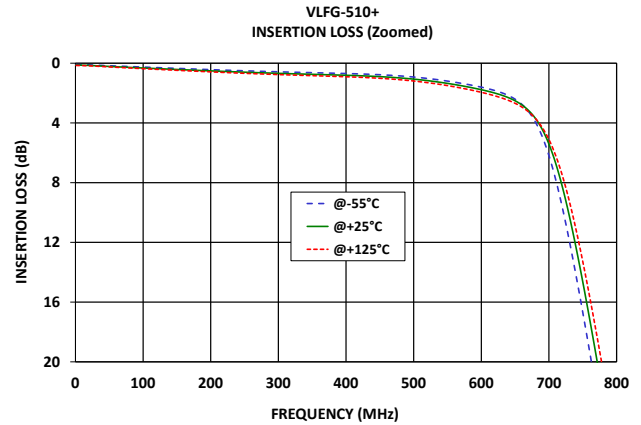
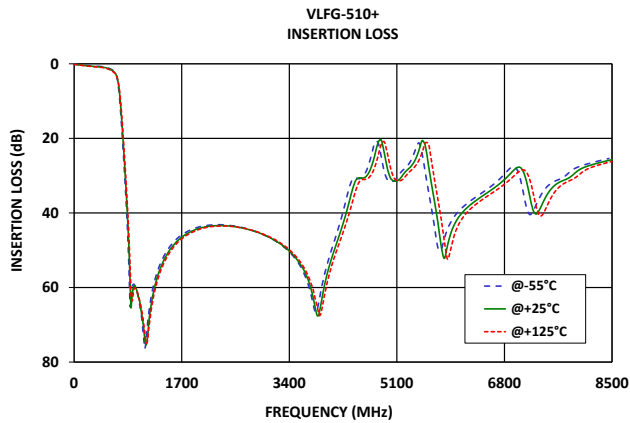
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TYPICAL PERFORMANCE GRAPHS AT +25°C

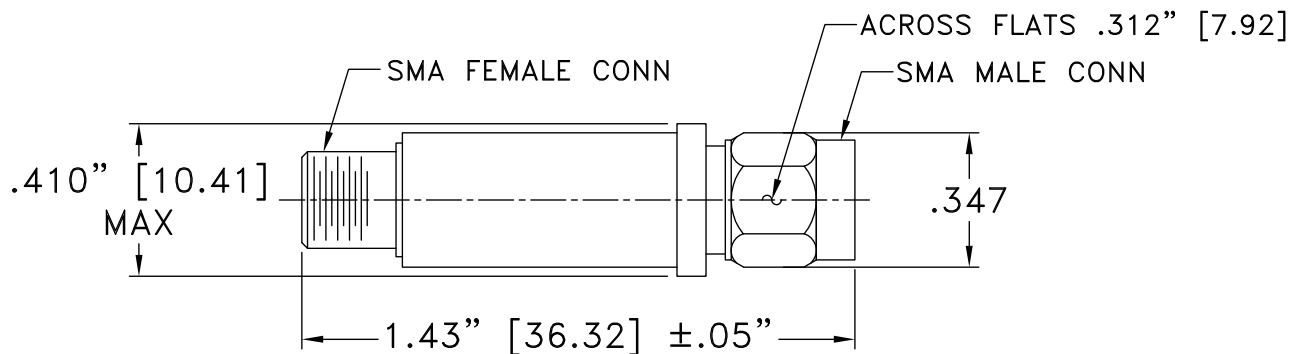




CONNECTOR DESCRIPTION

Function	Functionality	Connector
RF1 ¹	Port-1	SMA MALE
RF2 ¹	Port-2	SMA FEMALE

CASE STYLE DRAWING



Unit weight: 10.0grams

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm.04$ "; 3 Pl. $\pm.30$ "

PRODUCT MARKING*: VLFG-510+

*Marking may contain other features or characters for internal lot control.



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DC to 510 MHz

SMA Male/Female

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	FF704
RoHS Status	Compliant
Environmental Ratings	ENV123

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-Circuits' 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/terms/viewterm.html



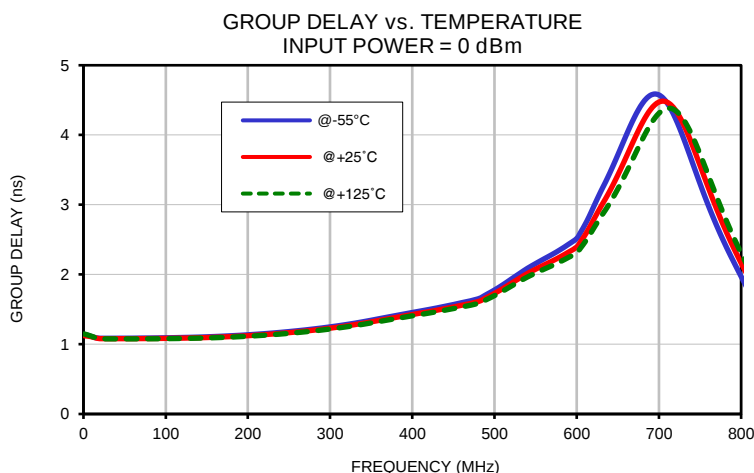
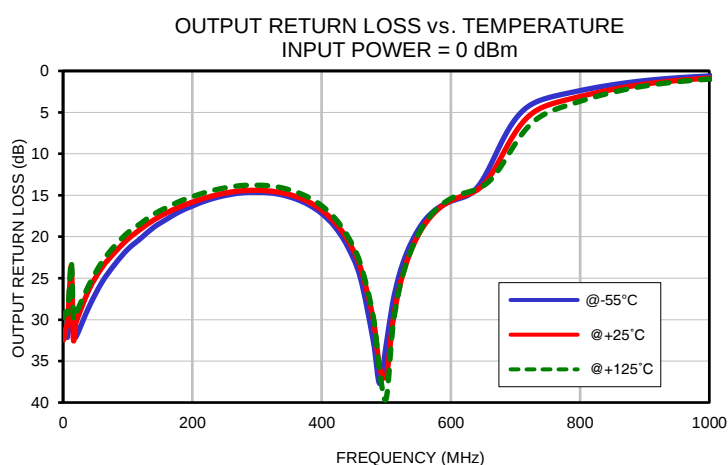
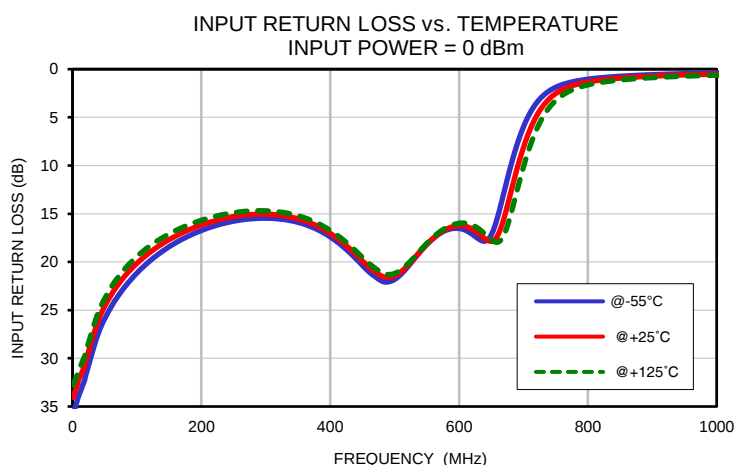
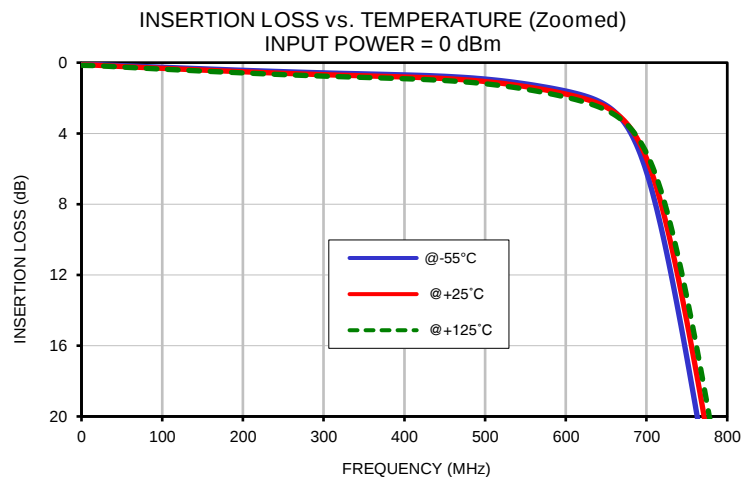
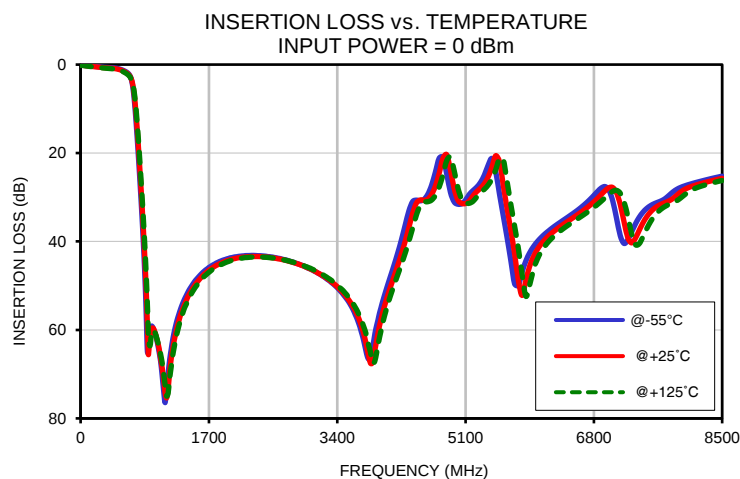
Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C	@-55°C	@+25°C	@+125°C
10	0.10	0.13	0.16	33.80	32.14	31.11	28.48	26.41	25.83
13	0.10	0.14	0.16	33.30	31.72	30.71	25.51	23.74	23.06
20	0.11	0.15	0.17	31.89	30.40	29.46	32.08	30.35	29.21
40	0.15	0.19	0.22	27.40	26.05	25.23	28.48	26.41	25.83
60	0.19	0.24	0.27	24.66	23.42	22.63	25.51	23.74	23.06
80	0.22	0.28	0.32	22.69	21.56	20.81	23.34	21.89	21.09
100	0.26	0.32	0.37	21.15	20.15	19.43	21.52	20.31	19.52
120	0.29	0.36	0.41	19.90	19.01	18.34	20.21	19.08	18.40
140	0.33	0.40	0.45	18.88	18.09	17.47	18.88	18.00	17.30
160	0.36	0.44	0.50	18.02	17.32	16.75	17.90	17.14	16.49
180	0.40	0.48	0.54	17.32	16.69	16.16	16.99	16.41	15.74
200	0.43	0.51	0.58	16.74	16.17	15.68	16.30	15.83	15.17
220	0.46	0.55	0.62	16.28	15.75	15.30	15.68	15.32	14.66
240	0.49	0.59	0.66	15.92	15.43	15.01	15.22	14.91	14.26
260	0.52	0.62	0.69	15.66	15.20	14.81	14.89	14.60	13.99
280	0.55	0.65	0.73	15.51	15.07	14.70	14.67	14.43	13.80
300	0.58	0.68	0.76	15.47	15.05	14.70	14.64	14.40	13.79
320	0.60	0.71	0.79	15.54	15.14	14.80	14.71	14.49	13.86
340	0.62	0.73	0.82	15.74	15.36	15.04	14.97	14.72	14.13
360	0.65	0.76	0.85	16.09	15.73	15.42	15.44	15.13	14.58
380	0.67	0.78	0.88	16.64	16.28	15.97	16.15	15.79	15.26
400	0.69	0.81	0.91	17.40	17.04	16.73	17.19	16.77	16.25
420	0.72	0.84	0.94	18.41	18.03	17.70	18.75	18.22	17.71
440	0.75	0.88	0.99	19.67	19.23	18.88	21.14	20.34	19.88
460	0.80	0.93	1.04	21.01	20.52	20.15	24.93	23.66	23.23
480	0.85	0.99	1.11	21.98	21.47	21.12	32.55	29.94	29.62
490	0.89	1.03	1.15	22.07	21.61	21.31	37.71	35.90	36.37
510	0.97	1.11	1.24	21.27	21.02	20.82	28.03	30.47	31.09
660	2.76	2.79	2.94	15.31	17.26	17.96	11.60	12.78	13.26
730	11.86	10.20	9.21	2.79	3.85	4.99	3.82	4.89	5.99
770	21.94	19.65	18.03	1.41	1.85	2.33	2.87	3.67	4.41
810	33.40	30.64	28.65	0.96	1.22	1.49	2.22	2.90	3.43
820	36.51	33.59	31.50	0.89	1.13	1.38	2.07	2.72	3.20
900	62.92	65.48	62.14	0.57	0.73	0.88	1.17	1.59	1.81
980	60.50	60.29	60.43	0.42	0.55	0.67	0.69	0.97	1.10
1100	73.71	71.13	69.82	0.30	0.41	0.50	0.35	0.52	0.61
1200	64.40	66.58	68.40	0.24	0.34	0.43	0.20	0.34	0.39
1300	56.58	58.08	59.19	0.21	0.30	0.38	0.12	0.26	0.28
1400	52.24	53.34	54.18	0.18	0.27	0.36	0.06	0.21	0.20
1500	49.33	50.22	50.88	0.17	0.26	0.34	0.02	0.18	0.15
1600	47.33	48.06	48.61	0.16	0.25	0.33	0.01	0.17	0.12
1700	45.87	46.48	46.97	0.16	0.25	0.33	0.03	0.14	0.08
1800	44.85	45.39	45.77	0.17	0.25	0.33	0.03	0.13	0.07
1900	44.15	44.58	44.92	0.17	0.26	0.33	0.04	0.11	0.06
2000	43.66	44.03	44.27	0.18	0.27	0.34	0.05	0.09	0.05
2200	43.19	43.46	43.62	0.20	0.29	0.35	0.07	0.07	0.03
2400	43.24	43.43	43.51	0.23	0.31	0.37	0.07	0.06	0.03
2600	43.72	43.86	43.86	0.26	0.34	0.40	0.08	0.08	0.03
2800	44.59	44.65	44.61	0.28	0.36	0.42	0.07	0.10	0.05
3000	45.91	45.89	45.74	0.30	0.39	0.45	0.07	0.11	0.06
3200	47.74	47.65	47.42	0.32	0.41	0.48	0.06	0.12	0.08
3400	50.43	50.19	49.89	0.34	0.43	0.51	0.03	0.12	0.11
3600	55.05	54.49	53.76	0.35	0.45	0.54	0.03	0.14	0.13
3800	66.05	64.57	62.33	0.38	0.48	0.58	0.01	0.18	0.17
4000	53.70	56.23	58.61	0.47	0.55	0.66	0.01	0.22	0.20
4500	30.82	30.61	31.82	1.88	3.39	4.22	0.21	0.37	0.38
5000	31.57	30.67	27.95	1.75	3.33	5.00	0.23	0.58	0.90
5500	24.19	20.60	23.76	1.40	1.98	1.28	0.56	0.74	0.51
6000	41.17	43.43	46.39	0.42	0.58	0.78	0.05	0.37	0.40
8500	25.23	25.71	26.20	0.76	0.97	1.20	0.63	0.84	0.83

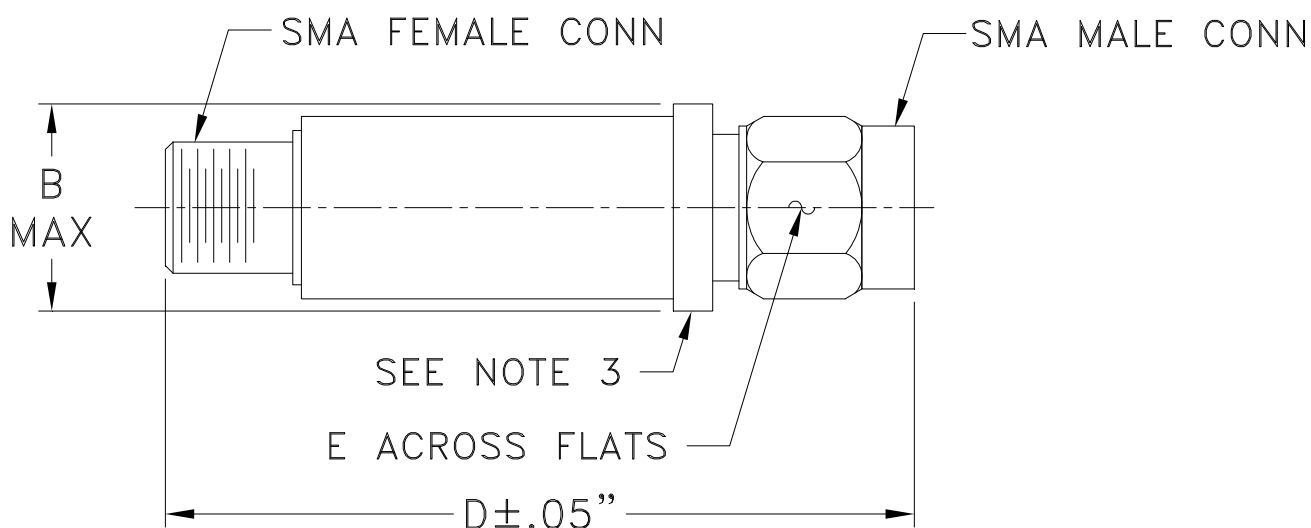
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-55°C	@+25°C	@+125°C
10	1.11	1.11	1.11
13	1.10	1.10	1.10
20	1.09	1.08	1.08
40	1.09	1.08	1.08
60	1.09	1.08	1.08
80	1.09	1.08	1.08
100	1.09	1.08	1.08
120	1.10	1.09	1.08
140	1.10	1.09	1.09
160	1.11	1.10	1.09
180	1.12	1.11	1.10
200	1.14	1.12	1.11
220	1.15	1.14	1.13
240	1.17	1.16	1.15
260	1.19	1.18	1.17
280	1.22	1.20	1.19
300	1.25	1.23	1.22
320	1.28	1.26	1.25
340	1.32	1.30	1.29
360	1.37	1.34	1.33
380	1.41	1.38	1.37
400	1.46	1.43	1.41
420	1.50	1.47	1.45
440	1.54	1.51	1.49
460	1.60	1.56	1.53
480	1.65	1.61	1.58
490	1.71	1.67	1.64
500	1.78	1.73	1.70
510	1.85	1.80	1.76

Typical Performance Curves



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.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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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.

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, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
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, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, Except +100°C