LTCC COAXIAL

High Pass Filter

VHFG-440+

50Ω 550 to 6000 MHz SMA Male/Female

KEY FEATURES

- Low Insertion Loss, 0.9 dB Typ.
- Return Loss, 10 dB Typ.
- Stopband Rejection, 52 dB Typ.
- Rugged Unibody Construction
- Power Handling: 4 Watts

Generic photo used for illustration purposes only

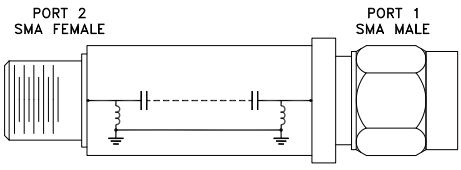
APPLICATIONS

- Test and Measurement
- Satellite Communications
- 5G Sub 6 GHz and Wi-Fi 6E

PRODUCT OVERVIEW

VHFG-440+ is a 50Ω high pass filter built in rugged unibody construction. Covering 550-6000 MHz bandwidth, these units offer good matching within the passband and good rejection in stopband. VHFG-440+ offer low insertion loss, and excellent power handling capability. It handles up to 4 W 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
Passband	Insertion Loss	F3-F4	550 - 1500	—	1.7	2.8	dB
		F4-F5	1500 - 6000	—	0.9	1.4	
	Return Loss	F3-F4	550 - 1500	—	10	—	dB
		F4-F5	1500 - 6000	—	10	—	
Stopband	Rejection	DC-F1	DC - 160	40	52	—	dB
		F1-F2	160 - 300	20	27	—	
	Freq. Cut-Off[3]	Fc	450	—	3	—	dB

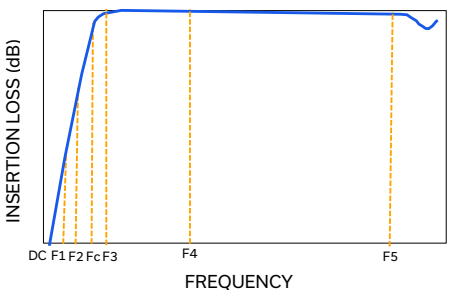
1. This filter is bi-directional, RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.
3. Typical variation ± 5%

ABSOLUTE MAXIMUM RATINGS[4]

Parameter	Ratings
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +125°C
Input Power[5]	4 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 0.8 W at +125°C.

TYPICAL FREQUENCY RESPONSE AT +25°C



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

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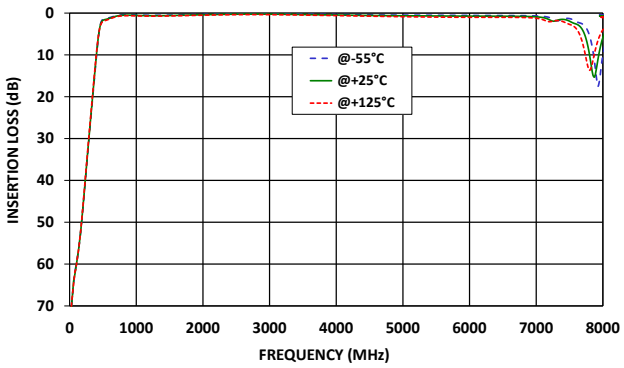
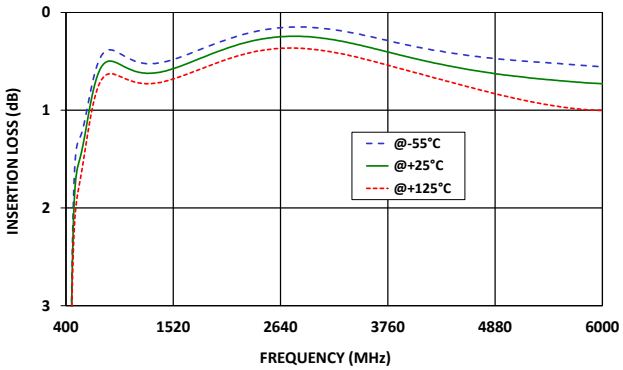
TYPICAL PERFORMANCE GRAPHS

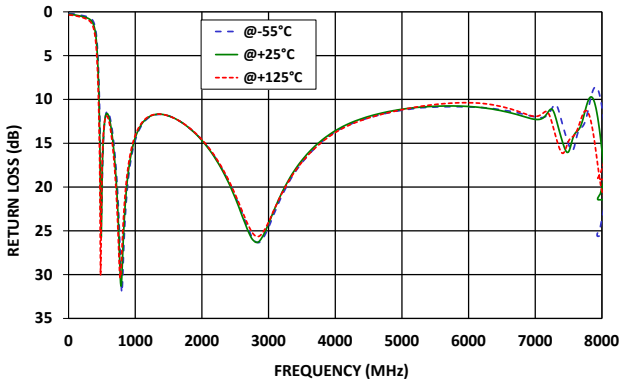
VHFG-440+
INSERTION LOSS



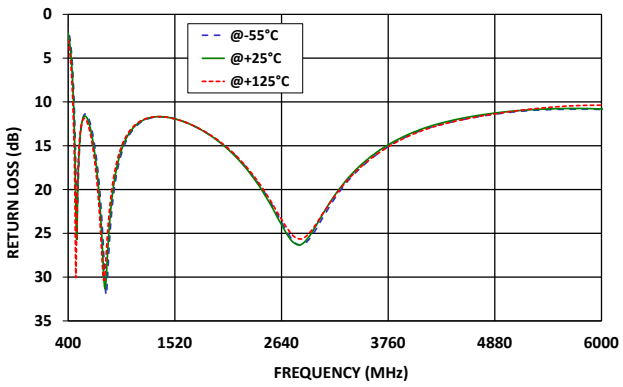
VHFG-440+
INSERTION LOSS (Zoomed)



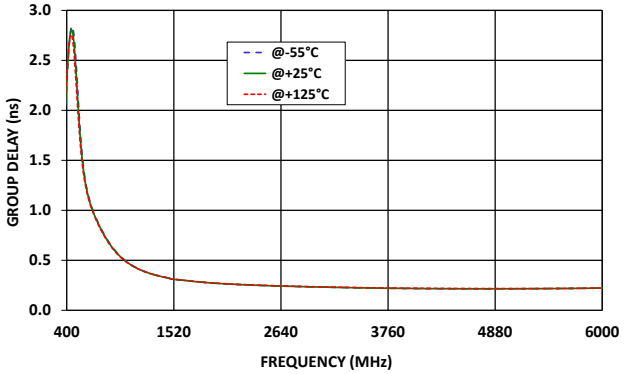
VHFG-440+
RETURN LOSS



VHFG-440+
RETURN LOSS (Zoomed)



VHFG-440+
GROUP DELAY



High Pass Filter

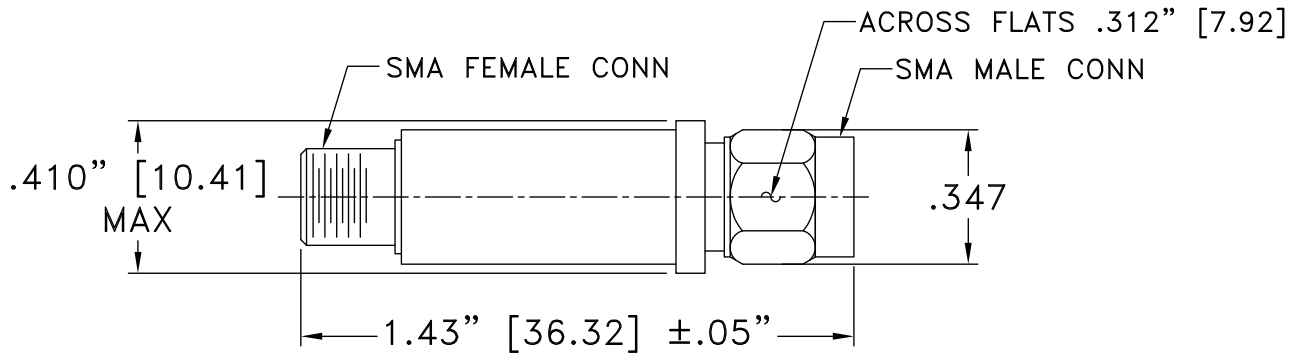
VHFG-440+

50Ω 550 to 6000 MHz SMA Male/Female

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. ±.04"; 3 Pl. ±.30"

PRODUCT MARKING*: VHFG-440+

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

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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	ENV113

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

Coaxial High Pass Filter VHFG-440+

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	72.59	72.99	82.94	0.19	0.27	0.36	0.19	0.27	0.36
20	74.09	73.79	73.99	0.19	0.27	0.36	0.19	0.28	0.37
30	69.62	69.82	69.08	0.20	0.28	0.37	0.20	0.29	0.38
40	68.19	67.90	67.78	0.21	0.29	0.38	0.21	0.30	0.39
50	66.00	65.97	66.19	0.21	0.30	0.38	0.22	0.31	0.40
60	64.56	64.08	64.75	0.22	0.31	0.39	0.23	0.32	0.41
70	63.18	63.16	63.30	0.23	0.33	0.41	0.24	0.33	0.42
80	61.99	62.34	61.72	0.25	0.34	0.42	0.25	0.34	0.43
90	60.92	61.26	61.43	0.26	0.35	0.43	0.26	0.35	0.44
100	60.11	60.19	60.41	0.27	0.36	0.45	0.27	0.36	0.46
160	53.18	53.05	52.89	0.35	0.45	0.55	0.33	0.43	0.53
200	46.59	46.38	46.08	0.41	0.52	0.63	0.37	0.48	0.59
250	37.49	37.17	36.73	0.49	0.62	0.76	0.44	0.56	0.69
300	28.39	27.98	27.48	0.61	0.77	0.96	0.53	0.68	0.85
340	21.26	20.82	20.28	0.79	1.00	1.27	0.69	0.87	1.10
400	10.75	10.35	9.90	1.79	2.28	2.94	1.56	1.96	2.49
450	3.69	3.68	3.73	6.84	8.39	10.52	5.77	6.75	7.91
500	1.47	1.73	2.03	21.56	20.30	18.55	13.43	12.98	12.52
550	1.27	1.48	1.70	12.06	12.07	12.16	10.98	10.93	10.99
600	1.09	1.24	1.41	11.54	11.89	12.34	11.09	11.38	11.80
690	0.66	0.78	0.91	15.87	16.80	17.86	15.73	16.62	17.76
700	0.62	0.74	0.87	16.71	17.75	18.92	16.60	17.60	18.89
760	0.46	0.57	0.71	24.60	26.80	28.80	24.90	27.44	30.82
800	0.41	0.52	0.65	32.02	29.95	27.23	33.42	30.95	27.85
880	0.38	0.50	0.63	20.28	19.32	18.44	20.10	19.13	18.25
900	0.39	0.50	0.63	18.80	18.04	17.34	18.62	17.84	17.14
990	0.43	0.54	0.67	14.95	14.62	14.31	14.80	14.42	14.12
1000	0.44	0.55	0.67	14.68	14.37	14.10	14.53	14.18	13.90
1100	0.49	0.59	0.71	12.92	12.77	12.65	12.79	12.59	12.47
1200	0.52	0.62	0.73	12.09	12.02	11.96	11.97	11.86	11.80
1400	0.51	0.61	0.71	11.72	11.70	11.70	11.63	11.58	11.58
1500	0.49	0.58	0.69	11.88	11.88	11.88	11.81	11.79	11.79
1600	0.46	0.55	0.65	12.19	12.20	12.20	12.15	12.15	12.15
1800	0.38	0.47	0.58	13.21	13.21	13.17	13.23	13.26	13.23
2000	0.30	0.39	0.51	14.63	14.69	14.58	14.77	14.89	14.83
2200	0.24	0.33	0.44	16.63	16.73	16.55	16.89	17.12	17.04
2400	0.19	0.28	0.39	19.33	19.50	19.20	19.81	20.22	20.10
2600	0.16	0.25	0.37	22.91	23.23	22.67	23.82	24.56	24.24
2800	0.15	0.24	0.36	26.22	26.27	25.57	27.43	27.69	26.86
3000	0.16	0.25	0.38	24.58	24.17	23.99	24.71	24.18	23.73
3200	0.18	0.28	0.41	20.99	20.64	20.72	20.76	20.35	20.22
3400	0.21	0.32	0.45	18.29	17.98	18.18	17.98	17.71	17.77
3600	0.25	0.36	0.50	16.32	16.06	16.29	16.02	15.84	15.99
3800	0.30	0.41	0.55	14.83	14.65	14.88	14.59	14.46	14.69
4000	0.34	0.46	0.60	13.71	13.57	13.78	13.55	13.45	13.70
4200	0.38	0.51	0.66	12.92	12.78	12.97	12.84	12.71	12.93
4400	0.41	0.55	0.71	12.35	12.19	12.37	12.33	12.16	12.30
4800	0.46	0.61	0.81	11.53	11.39	11.50	11.67	11.44	11.37
5000	0.48	0.64	0.86	11.24	11.12	11.17	11.48	11.22	11.04
5100	0.49	0.65	0.88	11.13	11.02	11.02	11.41	11.15	10.90
5200	0.50	0.66	0.90	11.03	10.93	10.89	11.35	11.08	10.78
5300	0.51	0.68	0.92	10.94	10.86	10.76	11.31	11.04	10.69
5400	0.51	0.68	0.94	10.89	10.81	10.66	11.27	11.00	10.61
5500	0.52	0.69	0.96	10.87	10.78	10.58	11.25	10.99	10.57
5600	0.53	0.70	0.97	10.85	10.76	10.50	11.22	10.98	10.54
5700	0.53	0.71	0.98	10.83	10.75	10.44	11.20	10.99	10.54
5800	0.54	0.72	0.99	10.83	10.75	10.40	11.18	11.01	10.56
5900	0.55	0.72	1.00	10.84	10.77	10.38	11.18	11.05	10.62
5950	0.55	0.73	1.00	10.84	10.79	10.37	11.19	11.08	10.66
6000	0.56	0.73	1.00	10.85	10.80	10.37	11.20	11.11	10.71

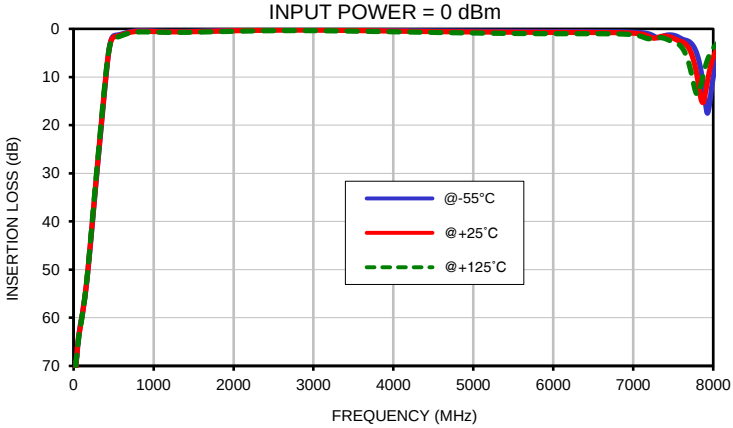
Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@-55°C	@+25°C	@+125°C
550	1.68	1.63	1.58
600	1.27	1.25	1.23
800	0.74	0.74	0.73
1000	0.51	0.50	0.50
1200	0.39	0.39	0.39
1500	0.31	0.31	0.31
1800	0.28	0.28	0.28
2000	0.27	0.27	0.27
2100	0.26	0.26	0.26
2200	0.26	0.26	0.26
2300	0.25	0.25	0.25
2400	0.25	0.25	0.25
2500	0.25	0.25	0.25
2600	0.24	0.24	0.25
2700	0.24	0.24	0.24
2800	0.24	0.24	0.24
2900	0.24	0.24	0.24
3000	0.23	0.23	0.24
3100	0.23	0.23	0.23
3200	0.23	0.23	0.23
3300	0.23	0.23	0.23
3800	0.22	0.22	0.22
4000	0.22	0.22	0.22
4100	0.22	0.22	0.22
4200	0.22	0.22	0.22
4300	0.22	0.22	0.22
4400	0.22	0.22	0.22
4500	0.22	0.22	0.22
4600	0.21	0.22	0.22
4700	0.21	0.22	0.22
4800	0.21	0.22	0.22
4900	0.22	0.22	0.22
5000	0.22	0.22	0.22
5100	0.22	0.22	0.22
5200	0.22	0.22	0.22
5300	0.22	0.22	0.22
5400	0.22	0.22	0.22
5500	0.22	0.22	0.22
5900	0.22	0.22	0.22
6000	0.22	0.22	0.22

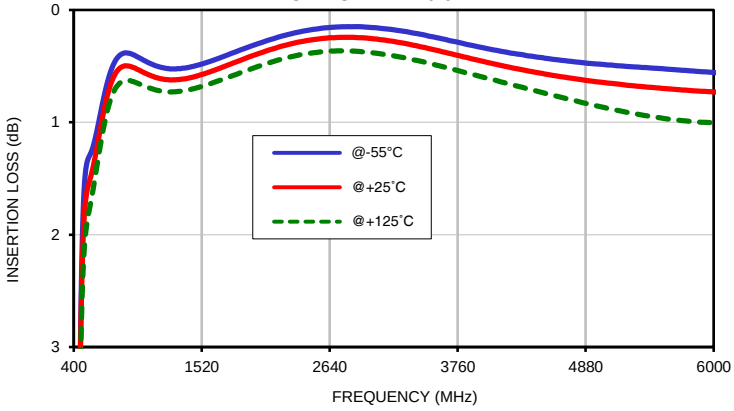
Coaxial High Pass Filter VHFG-440+

Typical Performance Curves

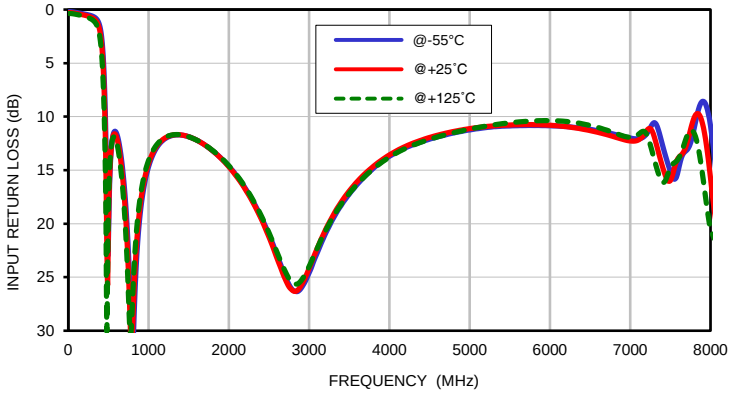
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



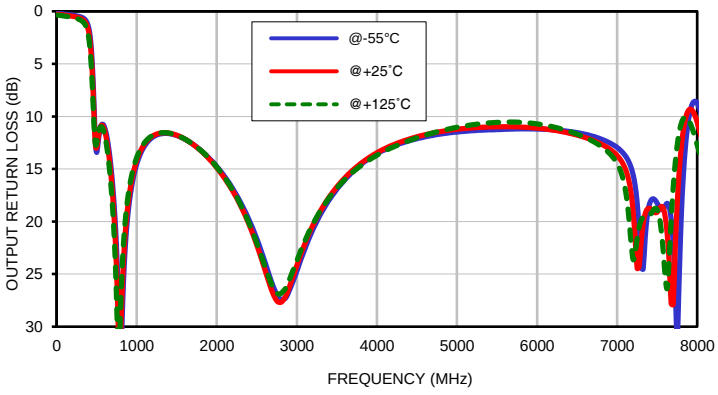
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



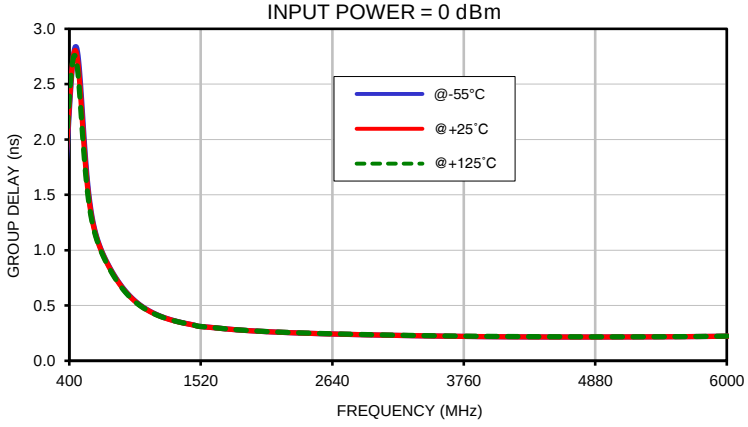
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



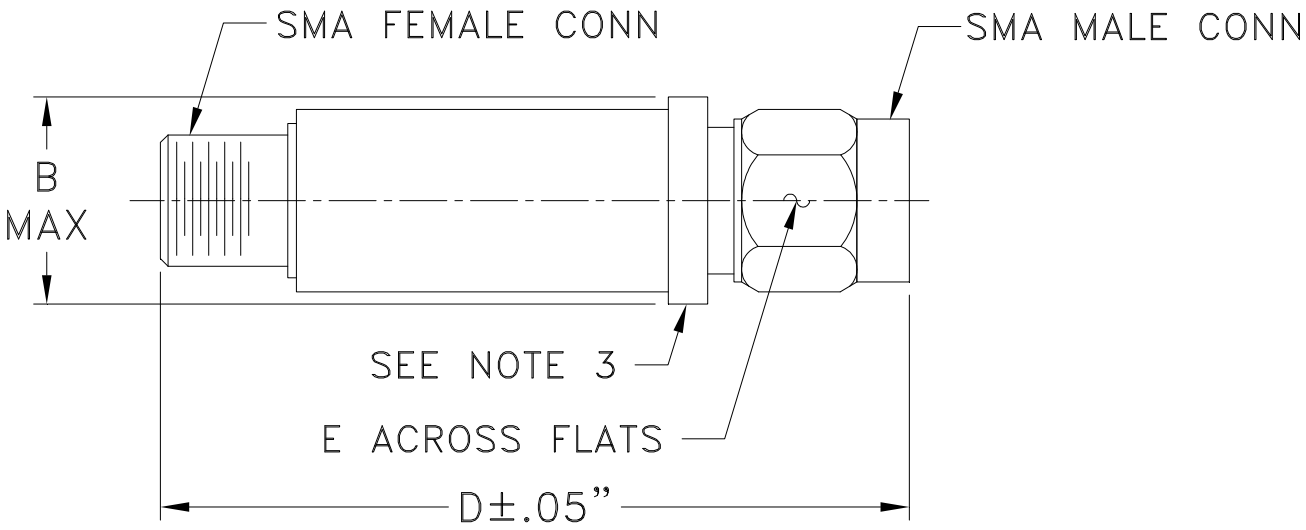
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style 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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Mini-Circuits

Environmental Specifications ENV113

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

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