LTCC COAXIAL

Bandpass Filter

VBF-2450+

50Ω 2400 to 2550 MHz SMA Female/Male

KEY FEATURES

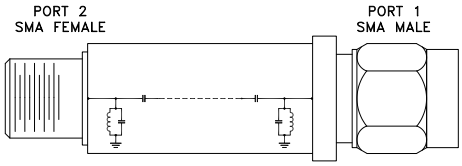
- Sharper Roll-off
- Return Loss, 14 dB Typ.
- Stopband Rejection, 30 dB Typ.
- Rugged Unibody Construction
- Power Handling: 2 Watts

Generic photo used for illustration purposes only

APPLICATIONS

- Harmonic Rejection
- ISM Band 2.4 - 2.485 GHz

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

VBF-2450+ is a 50Ω bandpass filter built in rugged unibody construction. Covering 2400-2550 MHz bandwidth, these units offer good matching within the passband and good rejection in stopband. VBF-2450+ offer good insertion loss, and excellent power handling capability. It handles up to 2W RF input power and provides a wide operating temperature range from -40°C to +85°C.

ELECTRICAL SPECIFICATIONS[1,2] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency[3]	—	—	—	2450	—	MHz
	Insertion Loss	F1-F2	2400 - 2550	—	2.4	4	dB
	Return Loss	F1-F2	2400 - 2550	—	14	—	dB
Stopband, Lower	Rejection	DC-F3	DC - 2100	—	30	—	dB
Stopband, Upper	Rejection	F4-F5	3400 - 12000	—	25	—	dB

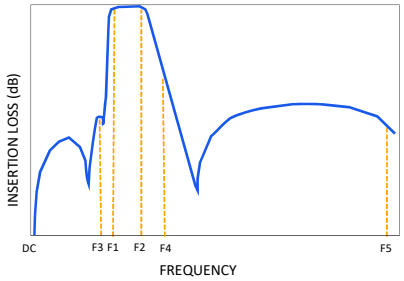
1. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.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

ABSOLUTE MAXIMUM RATINGS[4]

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power[5]	2 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 0.5 W at +85°C.

TYPICAL FREQUENCY RESPONSE AT +25°C



REV. OR
ECO-024956
VBF-2450+
EDU5029
URJ
250324

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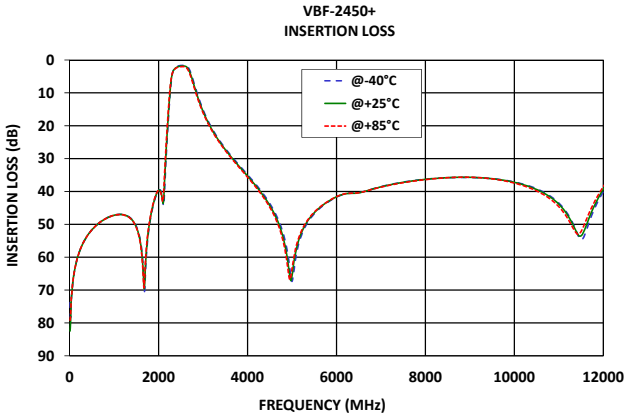
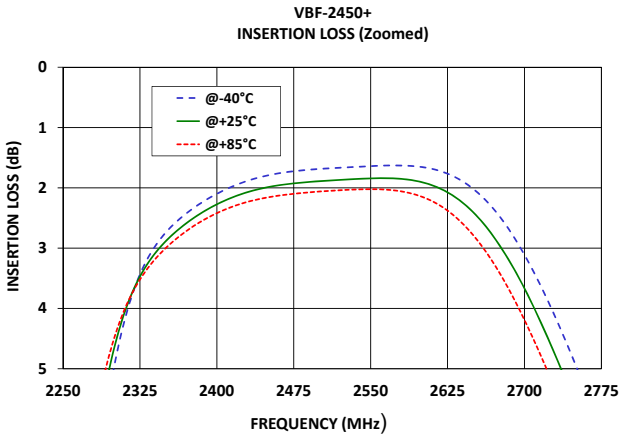
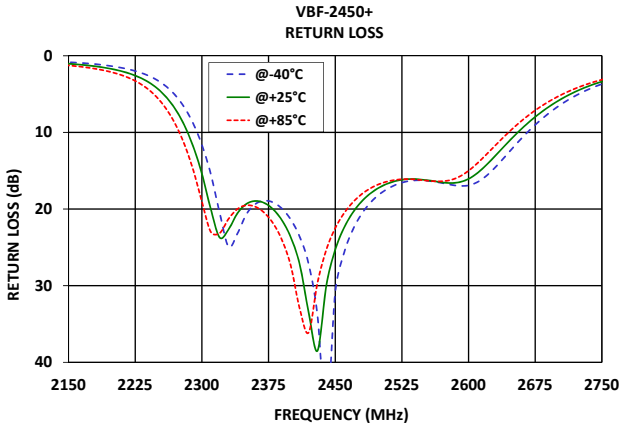
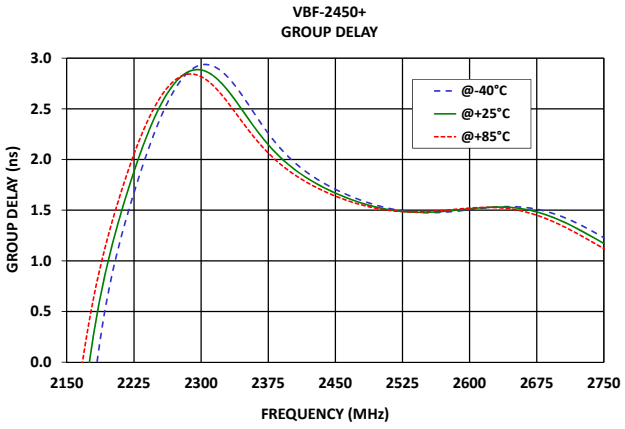
TYPICAL PERFORMANCE GRAPHS









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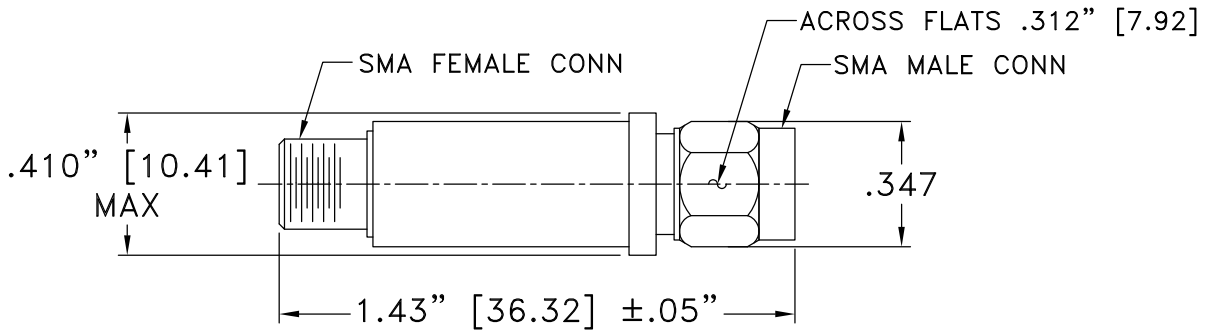
CONNECTOR DESCRIPTION

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*: VBF-2450+

*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 Bandpass Filter VBF-2450+

Typical Performance Data

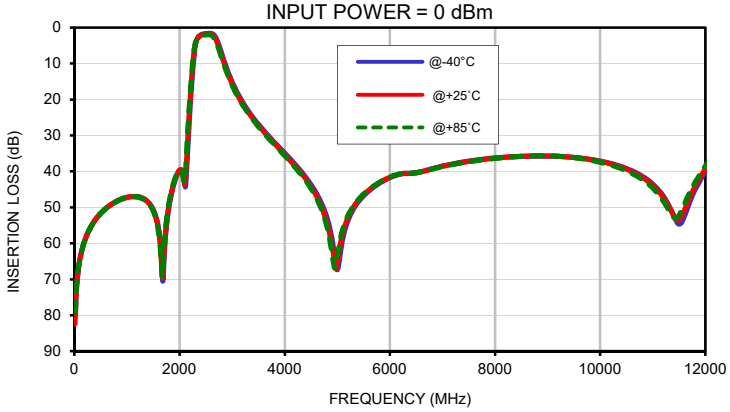
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	73.80	82.43	79.17	0.00	0.00	0.01	0.01	0.01	0.01
20	78.34	80.10	77.75	0.00	0.01	0.01	0.00	0.01	0.02
30	75.99	74.52	74.65	0.01	0.01	0.02	0.00	0.01	0.02
50	70.79	70.76	70.95	0.00	0.01	0.02	0.00	0.02	0.02
100	64.98	64.87	64.87	0.00	0.01	0.03	0.01	0.02	0.04
200	59.23	59.07	59.20	0.01	0.02	0.05	0.02	0.04	0.05
400	53.40	53.36	53.46	0.03	0.05	0.08	0.04	0.06	0.08
600	50.26	50.33	50.30	0.06	0.08	0.11	0.05	0.08	0.10
700	49.23	49.18	49.22	0.07	0.09	0.12	0.06	0.08	0.11
800	48.37	48.33	48.40	0.08	0.11	0.13	0.06	0.09	0.12
900	47.71	47.71	47.68	0.10	0.12	0.15	0.07	0.10	0.13
1000	47.20	47.27	47.25	0.11	0.13	0.16	0.07	0.11	0.14
1200	47.03	47.06	47.12	0.14	0.16	0.19	0.08	0.12	0.16
1300	47.46	47.54	47.59	0.15	0.18	0.21	0.09	0.13	0.17
1400	48.49	48.61	48.70	0.16	0.19	0.23	0.10	0.14	0.18
1500	50.60	50.86	51.00	0.17	0.21	0.25	0.11	0.15	0.20
1600	55.68	56.21	56.80	0.19	0.23	0.27	0.12	0.17	0.22
1700	66.27	63.73	62.24	0.21	0.26	0.31	0.14	0.20	0.25
1800	49.77	49.26	48.73	0.24	0.30	0.36	0.17	0.23	0.29
1900	43.16	42.85	42.59	0.29	0.36	0.43	0.22	0.29	0.35
2000	39.70	39.67	39.63	0.38	0.47	0.57	0.30	0.39	0.47
2100	43.51	43.64	42.82	0.59	0.73	0.89	0.48	0.61	0.74
2200	22.40	20.60	19.05	1.38	1.75	2.19	1.11	1.43	1.78
2300	4.95	4.64	4.48	11.63	15.40	19.03	8.74	10.71	12.31
2400	2.10	2.27	2.42	21.38	23.69	27.40	17.93	18.81	19.59
2410	2.02	2.19	2.35	23.61	27.20	32.98	18.79	19.62	20.09
2420	1.94	2.13	2.28	27.15	33.42	36.12	19.60	20.16	20.19
2430	1.88	2.07	2.23	33.88	38.49	29.65	20.14	20.25	19.87
2440	1.83	2.02	2.19	47.29	29.97	25.30	20.25	19.89	19.26
2450	1.79	1.99	2.16	30.86	25.31	22.49	19.92	19.24	18.56
2460	1.76	1.96	2.13	25.69	22.42	20.53	19.26	18.48	17.88
2470	1.73	1.94	2.11	22.65	20.42	19.09	18.49	17.76	17.30
2480	1.72	1.92	2.09	20.59	18.98	18.03	17.75	17.16	16.87
2490	1.70	1.90	2.07	19.12	17.92	17.26	17.14	16.71	16.60
2500	1.69	1.89	2.06	18.05	17.15	16.72	16.70	16.43	16.51
2520	1.67	1.87	2.04	16.75	16.28	16.16	16.32	16.42	16.95
2530	1.66	1.86	2.03	16.41	16.11	16.09	16.41	16.73	17.52
2540	1.65	1.85	2.03	16.25	16.08	16.14	16.71	17.29	18.41
2550	1.64	1.84	2.02	16.27	16.18	16.25	17.24	18.15	19.73
2700	3.11	3.67	4.19	6.67	5.93	5.35	7.35	6.56	5.90
3000	15.14	15.66	16.08	0.58	0.62	0.68	0.53	0.58	0.62
3175	20.17	20.60	20.93	0.33	0.38	0.45	0.27	0.33	0.39
3400	25.06	25.44	25.73	0.22	0.28	0.36	0.17	0.23	0.30
3700	30.25	30.62	30.92	0.15	0.22	0.30	0.12	0.19	0.26
4000	34.88	35.30	35.65	0.12	0.19	0.28	0.10	0.17	0.26
4500	43.67	44.24	44.83	0.10	0.17	0.27	0.08	0.17	0.27
5000	67.36	65.71	63.51	0.08	0.16	0.26	0.08	0.18	0.30
5500	46.80	46.47	46.28	0.09	0.18	0.28	0.10	0.20	0.33
6000	41.74	41.64	41.59	0.12	0.20	0.31	0.13	0.23	0.36
6500	40.39	40.44	40.41	0.15	0.24	0.34	0.16	0.26	0.40
7000	38.56	38.61	38.68	0.15	0.24	0.33	0.18	0.29	0.42
7500	37.15	37.22	37.33	0.17	0.26	0.34	0.20	0.31	0.43
8000	36.27	36.31	36.41	0.17	0.27	0.35	0.21	0.33	0.45
8500	35.83	35.79	35.81	0.18	0.29	0.40	0.21	0.34	0.45
9000	35.75	35.71	35.67	0.20	0.32	0.47	0.20	0.34	0.45
9500	36.10	36.11	36.17	0.24	0.38	0.56	0.19	0.35	0.47
10000	37.12	37.23	37.46	0.31	0.46	0.67	0.19	0.36	0.50
10500	39.18	39.41	39.84	0.38	0.55	0.77	0.20	0.37	0.55
11000	43.54	43.87	44.66	0.45	0.63	0.87	0.22	0.40	0.62
12000	40.06	39.30	38.52	0.48	0.71	0.95	0.30	0.51	0.79

Typical Performance Data

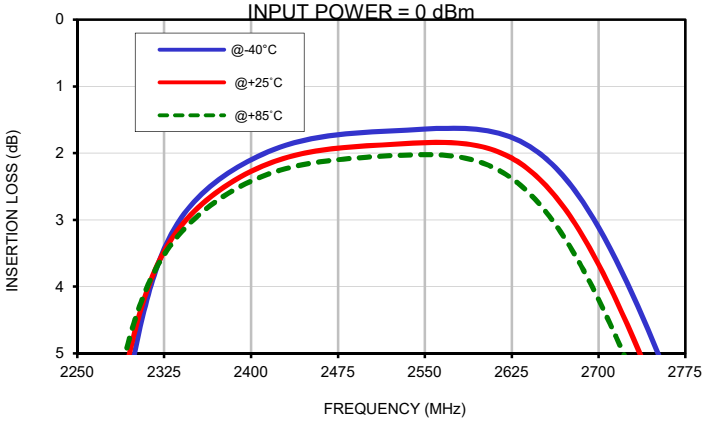
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25˚C	@+85˚C
2400	2.01	1.93	1.88
2410	1.93	1.87	1.82
2420	1.86	1.81	1.77
2430	1.80	1.76	1.72
2440	1.75	1.71	1.68
2450	1.71	1.67	1.64
2460	1.66	1.63	1.61
2470	1.63	1.60	1.58
2480	1.59	1.57	1.55
2490	1.56	1.54	1.53
2500	1.54	1.52	1.51
2510	1.52	1.50	1.50
2520	1.50	1.49	1.49
2530	1.49	1.48	1.48
2540	1.48	1.48	1.48
2550	1.48	1.48	1.49

Typical Performance Curves

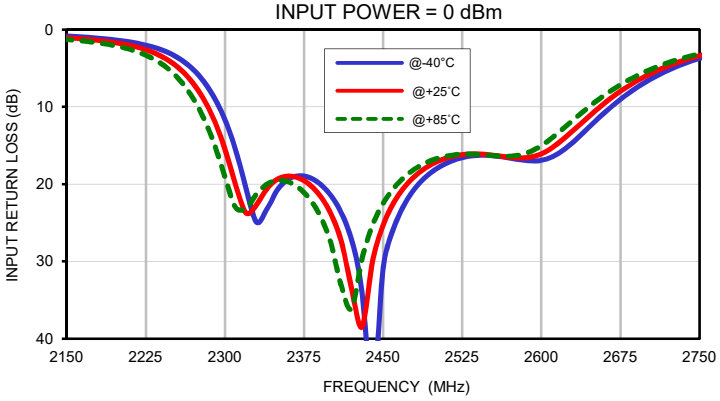
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



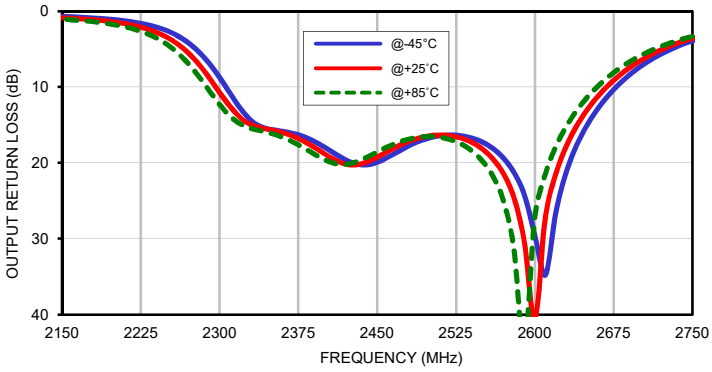
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



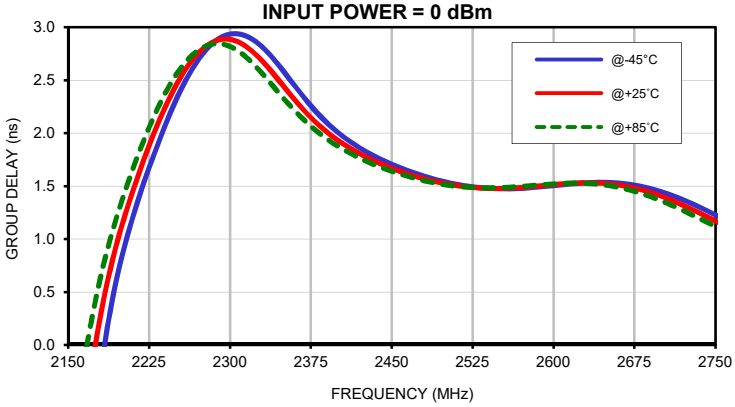
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



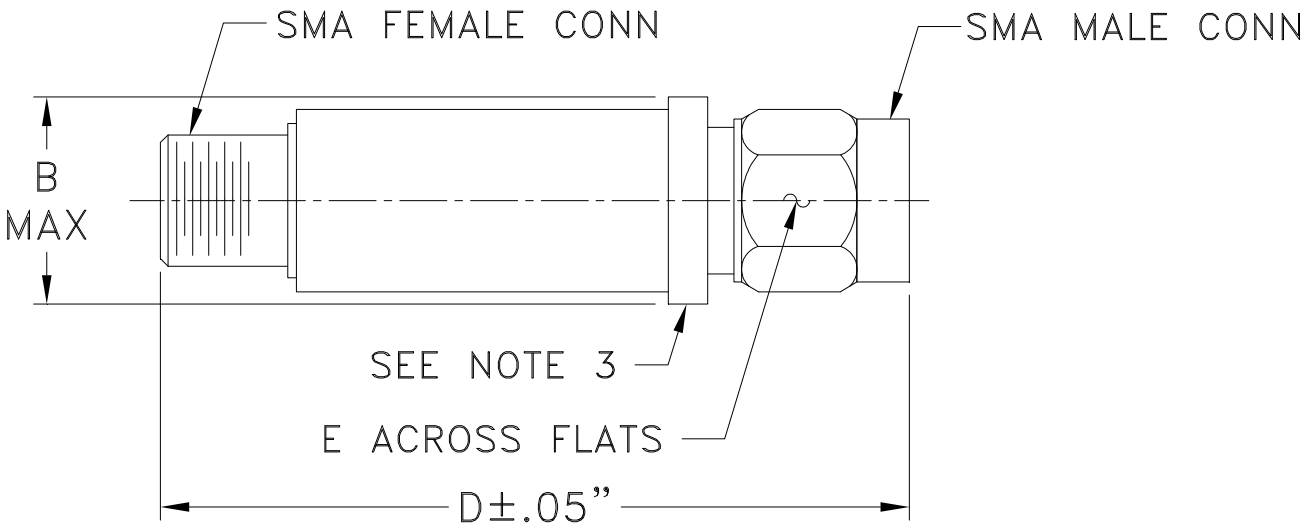
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



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.

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