Coaxial

Bandpass Filter

ZABP-495-S+

50Ω 470 to 520 MHz

Generic photo used for illustration purposes only
CASE STYLE: UU1842

The Big Deal

- High rejection
- Good VSWR
- Connectorized package

Product Overview

ZABP-495-S+ is a 50Ω bandpass filter with a rugged connectorized package covering the passband of 470 to 520 MHz. The bandpass filter offers good matching within the passband and provides high rejection. This filter has miniature high Q capacitors and wire welded inductors for high reliability. It has repeatable performance across lots and consistent performance across temperature.

Key Features

Feature	Advantages
High rejection	ZABP-495-S+ has sharper transition and rejects spurious signals in the stopband.
Good VSWR	This filter maintains typical VSWR over passband frequency range making this filter easier to integrate into receiver and transmitter RF chains with less concerns for in band frequency ripple.
Connectorized package	Connectorized package is easy to interface with other devices and well suited for test setups.

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Bandpass Filter

ZABP-495-S+

50Ω 470 to 520 MHz

Generic photo used for illustration purposes only

CASE STYLE: UU1842

Connectors	Model
SMA-M\F	ZABP-495-S+

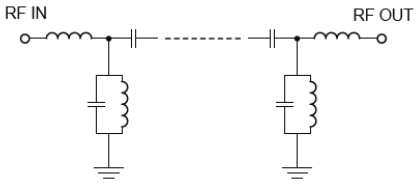
Features

- High rejection
- Good VSWR, 1.2:1 typical@ passband
- Connectorized package

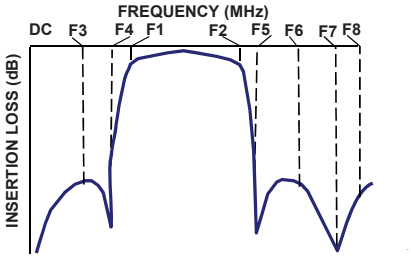
Applications

- Harmonic rejection
- Transmitters / receivers
- TV broadcasting
- Test equipment

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	-	-	-	495	-	MHz
	Insertion Loss	F1-F2	470-520	-	1.8	3.0	dB
	VSWR	F1-F2	470-520	-	1.2	1.55	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 300	60	76	-	dB
		F3-F4	300 - 410	20	27	-	dB
	VSWR	DC-F4	DC - 410	-	20	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	625 - 800	20	31	-	dB
		F6-F7	800 - 3200	-	55	-	dB
		F7-F8	3200 - 4000	-	40	-	dB
	VSWR	F5-F8	625 - 4000	-	20	-	:1

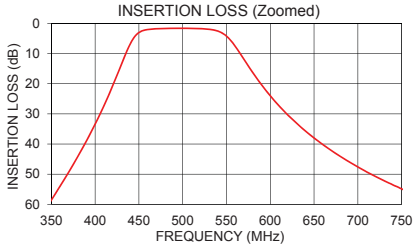
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1 W max.

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

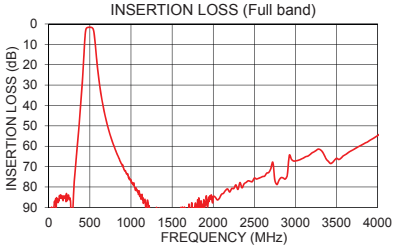
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1	97.07	192.68	470	12.06
100	87.64	75.93	472	11.78
300	84.96	146.41	474	11.54
405	30.44	30.98	476	11.33
410	27.34	26.36	478	11.13
420	20.72	17.94	480	10.96
430	13.59	10.19	482	10.81
450	3.03	1.74	484	10.67
455	2.34	1.33	486	10.55
470	1.77	1.05	490	10.34
495	1.62	1.11	492	10.26
520	1.73	1.12	495	10.15
545	3.17	1.89	496	10.12
570	12.13	7.92	497	10.09
590	20.50	15.68	498	10.07
620	30.44	27.68	500	10.03
625	31.84	29.75	504	9.98
800	60.63	84.05	510	9.99
3200	63.30	42.91	516	10.10
4000	54.74	36.77	520	10.24

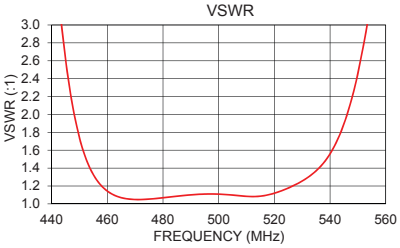
ZABP-495-S+
INSERTION LOSS (Zoomed)



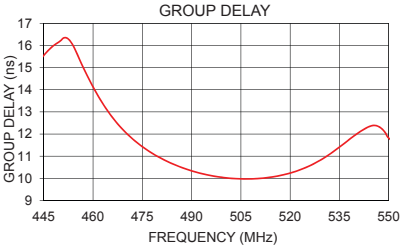
ZABP-495-S+
INSERTION LOSS (Full band)



ZABP-495-S+
VSWR



ZABP-495-S+
GROUP DELAY



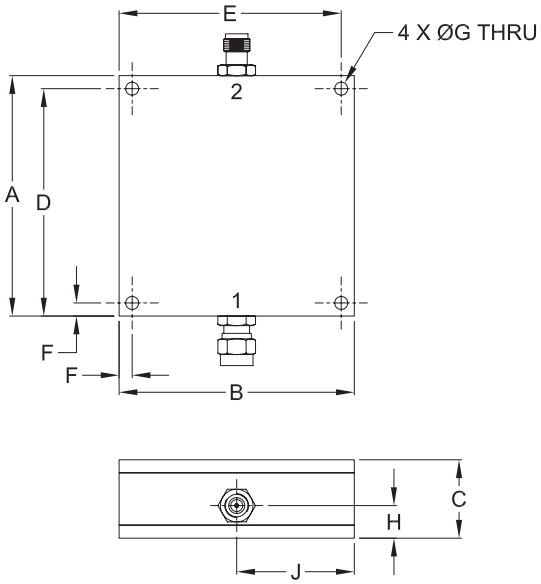
Notes

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.
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/MCLStore/terms.jsp

Coaxial Connections

PORT - 1	SMA-MALE
PORT - 2	SMA-FEMALE

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E
2.300	**2.250**	**.750**	**2.175**	**2.125**
58.42	57.15	19.05	55.25	53.98

F	G	H	J	wt.
.125	**.125**	**.312**	**1.125**	**grams**
3.18	3.18	7.93	28.58	124

Note: Please refer to case style drawing for details

Coaxial Band Pass Filter ZABP-495-S+

Typical Performance Data

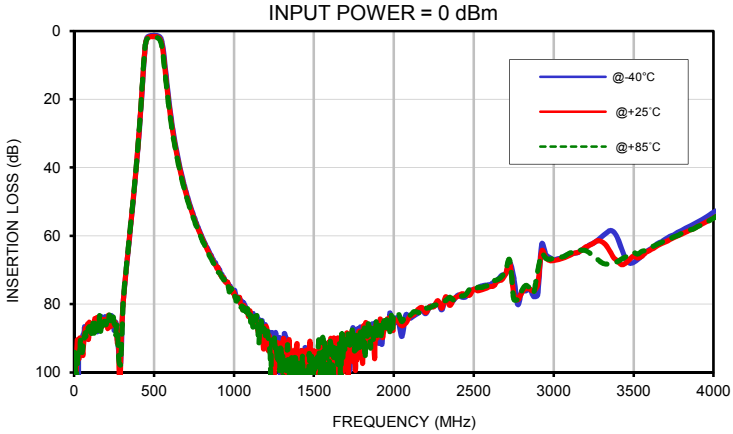
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	99.63	97.07	96.42	0.07	0.09	0.11	0.07	0.09	0.11
5	106.81	104.04	97.11	0.09	0.11	0.13	0.09	0.11	0.13
25	106.99	92.28	93.65	0.17	0.20	0.21	0.16	0.19	0.20
50	90.93	92.63	94.18	0.21	0.24	0.26	0.19	0.22	0.24
75	87.96	88.19	89.61	0.22	0.24	0.26	0.19	0.22	0.23
100	88.65	87.64	87.11	0.20	0.23	0.24	0.18	0.20	0.22
125	87.45	86.72	88.52	0.17	0.20	0.22	0.16	0.18	0.20
150	85.58	85.15	84.71	0.15	0.18	0.19	0.14	0.16	0.17
175	85.21	86.63	85.01	0.12	0.15	0.16	0.12	0.14	0.15
200	84.21	85.22	86.06	0.10	0.13	0.15	0.10	0.13	0.14
225	83.60	86.69	83.83	0.08	0.12	0.14	0.09	0.12	0.13
250	87.69	86.17	85.69	0.08	0.11	0.13	0.08	0.11	0.12
275	91.66	90.79	92.27	0.07	0.11	0.13	0.08	0.11	0.13
300	85.99	84.96	87.84	0.08	0.12	0.14	0.09	0.13	0.14
325	70.37	70.16	70.00	0.09	0.14	0.16	0.11	0.15	0.17
350	58.80	58.58	58.27	0.13	0.19	0.21	0.15	0.21	0.23
375	47.15	46.78	46.41	0.20	0.28	0.32	0.25	0.33	0.36
400	33.92	33.41	32.99	0.37	0.49	0.55	0.46	0.61	0.66
405	30.98	30.44	30.00	0.43	0.56	0.63	0.54	0.70	0.77
410	27.93	27.34	26.88	0.51	0.66	0.74	0.64	0.82	0.90
415	24.74	24.11	23.61	0.61	0.79	0.89	0.76	0.98	1.09
420	21.39	20.72	20.20	0.75	0.97	1.11	0.93	1.20	1.34
425	17.90	17.20	16.64	0.97	1.25	1.43	1.18	1.52	1.72
430	14.29	13.59	13.02	1.32	1.71	1.99	1.57	2.04	2.34
435	10.67	10.03	9.50	1.96	2.55	3.00	2.26	2.94	3.45
440	7.29	6.84	6.44	3.21	4.15	4.90	3.56	4.60	5.47
445	4.59	4.44	4.26	5.58	7.00	8.21	5.96	7.50	8.91
450	2.91	3.03	3.04	9.45	11.38	13.08	9.83	11.85	13.90
455	2.08	2.34	2.46	14.75	17.09	19.19	14.97	17.31	19.89
460	1.71	2.03	2.19	20.99	23.54	25.78	20.74	23.17	25.70
465	1.55	1.87	2.04	27.24	29.52	31.34	26.40	28.72	30.18
470	1.45	1.77	1.95	31.60	32.50	32.96	31.62	33.85	33.63
480	1.35	1.67	1.84	30.73	29.64	28.77	42.73	46.44	40.13
495	1.30	1.62	1.79	26.25	25.70	26.24	33.72	32.70	37.65
500	1.29	1.62	1.80	25.90	25.75	26.76	31.47	31.27	35.48
510	1.31	1.64	1.84	27.35	27.87	28.68	30.95	32.40	33.56
520	1.36	1.73	1.95	25.94	25.00	23.76	28.05	27.34	25.17
530	1.51	1.94	2.23	19.65	18.91	17.95	20.20	18.98	17.47
540	1.93	2.53	2.98	13.89	13.21	12.28	13.20	12.02	10.87
550	3.23	4.20	4.96	8.04	7.50	6.94	7.15	6.39	5.77
575	12.97	14.33	15.27	1.65	1.78	1.84	1.32	1.41	1.44
593	20.29	21.45	22.24	0.90	1.04	1.11	0.73	0.85	0.91
623	30.26	31.16	31.79	0.49	0.61	0.67	0.43	0.53	0.57
625	30.98	31.84	32.48	0.47	0.58	0.65	0.42	0.51	0.56
650	37.31	38.05	38.61	0.34	0.44	0.49	0.32	0.40	0.44
700	47.04	47.61	48.11	0.21	0.30	0.35	0.21	0.29	0.32
800	60.33	60.63	61.14	0.13	0.21	0.25	0.14	0.21	0.23
900	69.22	69.27	70.54	0.11	0.19	0.22	0.12	0.20	0.21
1000	75.96	76.60	77.42	0.11	0.18	0.22	0.13	0.21	0.21
1250	94.01	102.08	88.66	0.14	0.22	0.25	0.16	0.26	0.25
1500	99.49	93.87	95.85	0.18	0.26	0.30	0.20	0.30	0.29
1750	92.19	92.41	92.20	0.21	0.30	0.35	0.24	0.34	0.32
2000	85.78	84.68	83.26	0.23	0.33	0.39	0.25	0.35	0.34
2250	80.71	80.76	80.41	0.23	0.35	0.42	0.25	0.35	0.35
2500	75.82	75.61	76.17	0.24	0.36	0.44	0.24	0.34	0.36
2750	72.11	76.91	78.56	0.32	0.42	0.49	0.23	0.33	0.37
3000	66.99	67.23	66.53	0.25	0.39	0.48	0.23	0.34	0.39
3200	63.51	63.30	64.33	0.25	0.40	0.49	0.23	0.35	0.41
3500	67.79	65.92	64.93	0.26	0.43	0.55	0.26	0.40	0.46
4000	53.06	54.74	54.86	0.26	0.47	0.63	0.34	0.54	0.58

Typical Performance Data

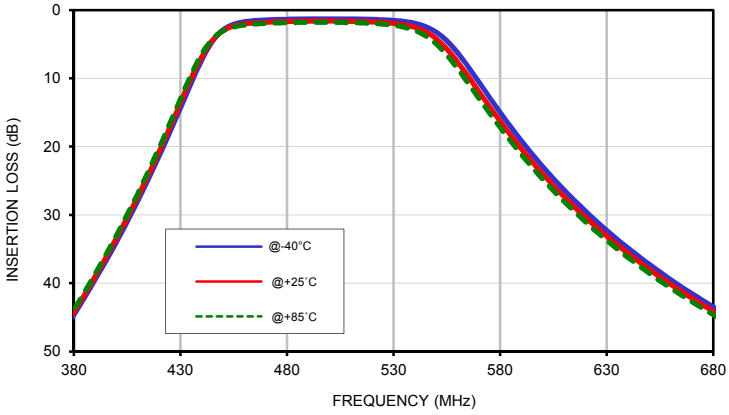
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
470	12.26	12.06	11.92
471	12.10	11.92	11.79
472	11.95	11.78	11.67
473	11.82	11.66	11.55
474	11.69	11.54	11.44
475	11.56	11.43	11.34
476	11.45	11.33	11.24
477	11.34	11.23	11.15
478	11.23	11.13	11.06
479	11.14	11.04	10.98
480	11.05	10.96	10.90
481	10.96	10.88	10.83
482	10.88	10.81	10.76
483	10.80	10.73	10.69
484	10.73	10.67	10.63
485	10.66	10.60	10.57
486	10.60	10.55	10.52
487	10.54	10.49	10.46
488	10.48	10.44	10.41
489	10.42	10.39	10.37
490	10.37	10.34	10.33
491	10.32	10.30	10.29
492	10.28	10.26	10.25
493	10.23	10.22	10.21
494	10.19	10.18	10.19
495	10.16	10.15	10.16
496	10.13	10.12	10.13
497	10.09	10.09	10.11
498	10.06	10.07	10.09
499	10.04	10.05	10.07
500	10.01	10.03	10.06
501	9.99	10.01	10.05
502	9.97	10.00	10.03
503	9.96	9.99	10.03
504	9.94	9.98	10.02
505	9.94	9.98	10.02
506	9.93	9.97	10.03
507	9.92	9.97	10.03
508	9.92	9.97	10.03
509	9.92	9.98	10.04
510	9.92	9.99	10.06
511	9.93	10.00	10.07
512	9.94	10.01	10.09
513	9.95	10.03	10.11
514	9.96	10.05	10.13
515	9.98	10.07	10.16
516	10.00	10.10	10.19
517	10.02	10.13	10.23
518	10.05	10.16	10.27
519	10.08	10.20	10.31
520	10.11	10.24	10.36

Typical Performance Curves

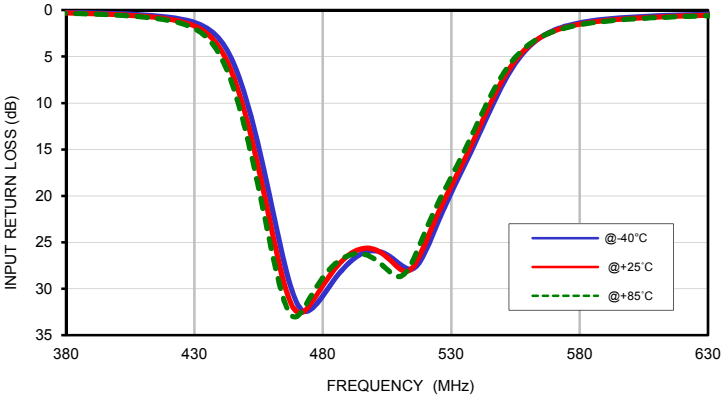
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



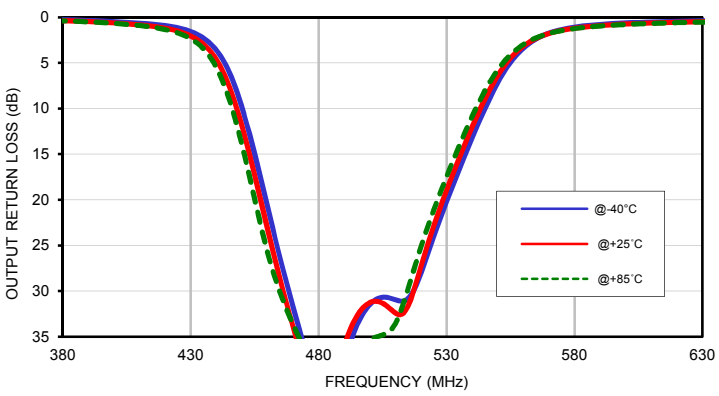
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



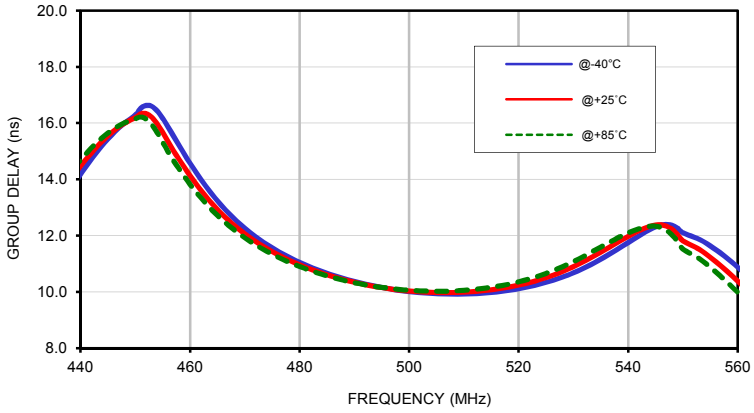
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



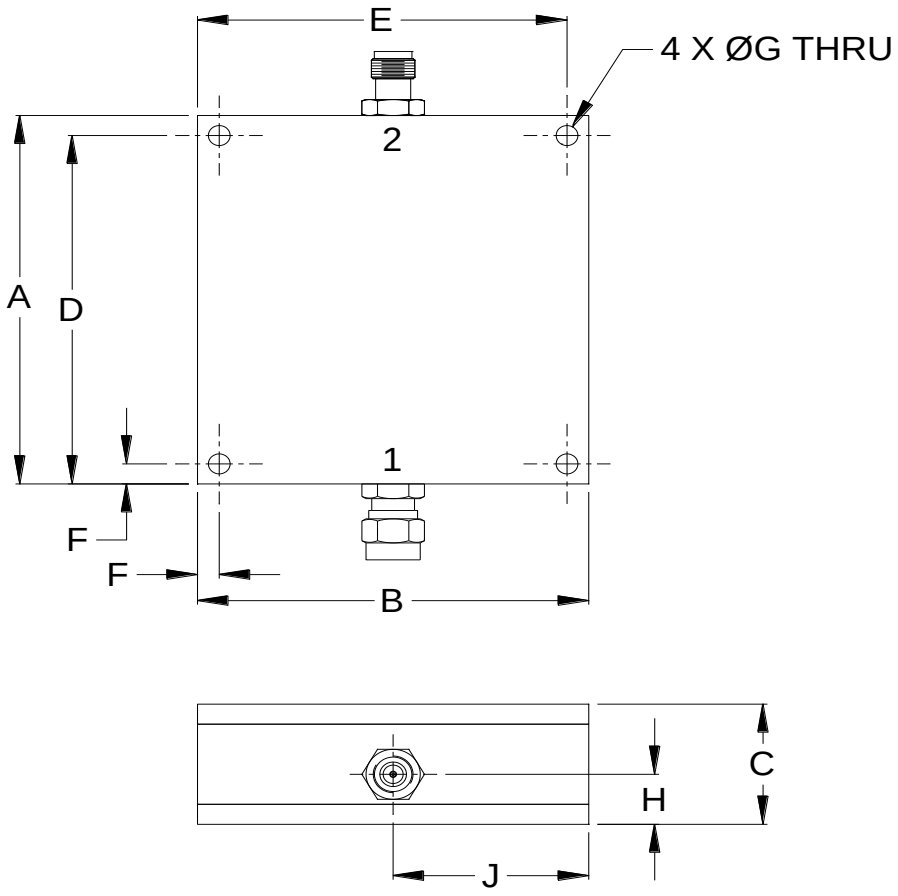
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style UU

Outline Dimensions

UU1842



CASE#	A	B	C	D	E	F	G	H	J	WT.GRAMS
UU1842	2.300 (58.42)	2.250 (57.15)	0.750 (19.05)	2.175 (55.25)	2.125 (53.98)	0.125 (3.18)	0.125 (3.18)	0.312 (7.93)	1.125 (28.58)	124

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.

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