

Plug-In High Pass Filter

PHP-400+

50Ω 395 to 2000 MHz

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W max.
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

INPUT	1
OUTPUT	8
GROUND	2,3,4,5,6,7
CASE GROUND	2,3,4,5,6,7

Features

- rugged shielded case, hermetically sealed
- other standard and custom PHP models available with wide selection of fco

Applications

- lab use
- transmitters/receivers
- military/hi-rel application



Generic photo used for illustration purposes only

CASE STYLE: A01

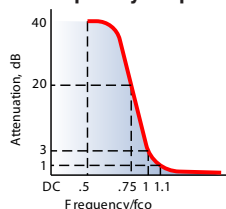
+RoHS Compliant

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

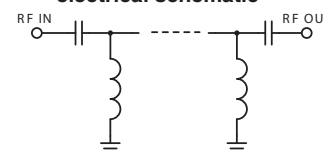
High Pass Filter Electrical Specifications

STOPBAND (MHz)		fco (MHz) Nom.	PASSBAND (MHz)	VSWR (:1)	
(loss > 40 dB)	(loss > 20 dB)	(loss 3 dB)	(loss < 1 dB)	Stopband Typ.	Passband Typ.
DC-210	210-290	370	395-2000	17	1.8

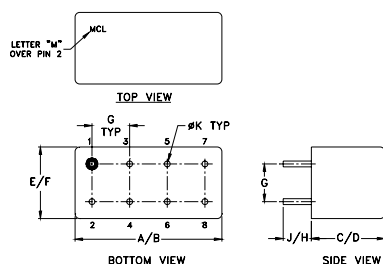
typical frequency response



electrical schematic



Outline Drawing

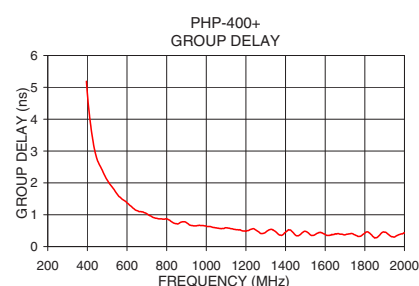
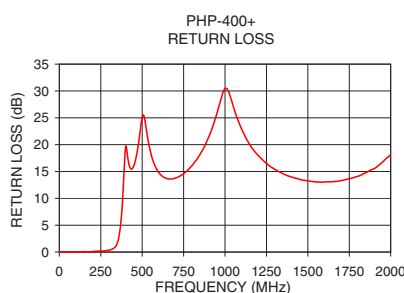
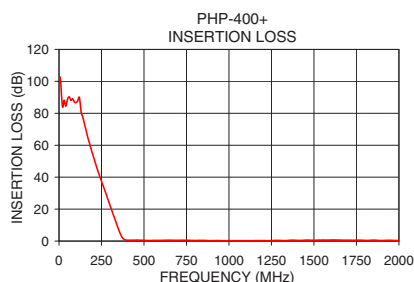


Outline Dimensions (inch/mm)

A	B	C	D	E	F
.770	.800	.385	.400	.370	.400
19.56	20.32	9.78	10.16	9.40	10.16
G	H	J	K	wt	
.200	.20	.14	.031	grams	
5.08	5.08	3.56	0.79		5.2

Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	Group Delay (nsec)
$\bar{x}$	σ			
1.00	102.95	4.51	395.00	5.19
50.00	88.72	5.16	425.00	3.44
100.00	86.70	3.32	450.00	2.72
210.00	50.22	0.43	500.00	2.09
290.00	25.51	0.38	550.00	1.65
320.00	16.35	0.43	600.00	1.37
350.00	7.49	0.45	700.00	1.03
370.00	2.60	0.30	800.00	0.87
380.00	1.29	0.16	1000.00	0.64
395.00	0.62	0.05	1100.00	0.59
425.00	0.57	0.02	1200.00	0.48
550.00	0.35	0.01	1300.00	0.45
750.00	0.42	0.01	1400.00	0.45
1000.00	0.24	0.02	1500.00	0.48
1250.00	0.29	0.02	1600.00	0.38
1500.00	0.40	0.03	1700.00	0.37
1750.00	0.45	0.03	1800.00	0.42
2000.00	0.32	0.02	2000.00	0.43



Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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



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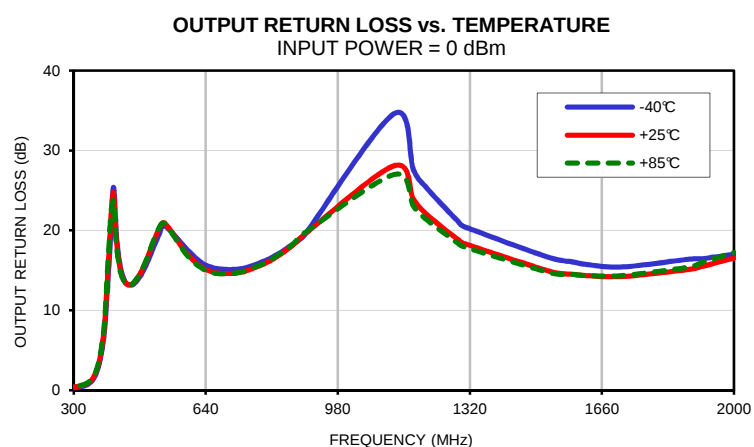
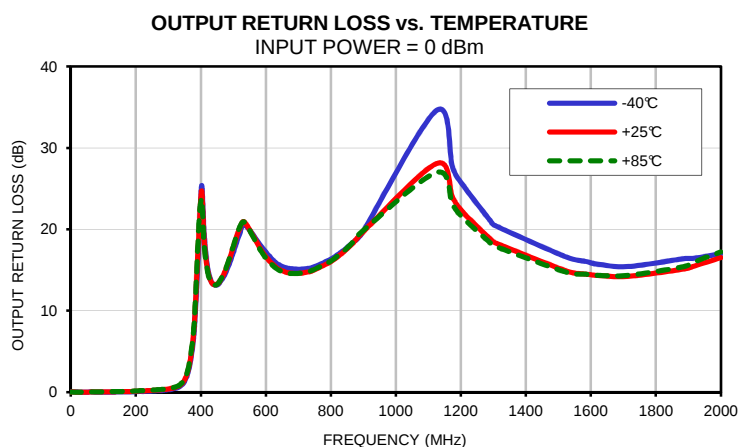
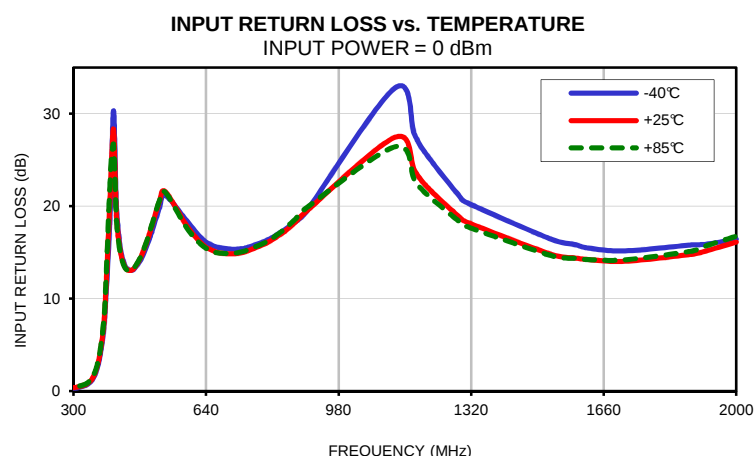
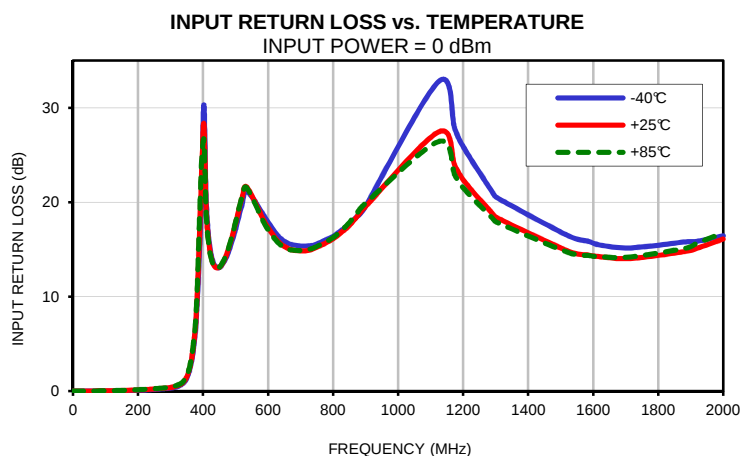
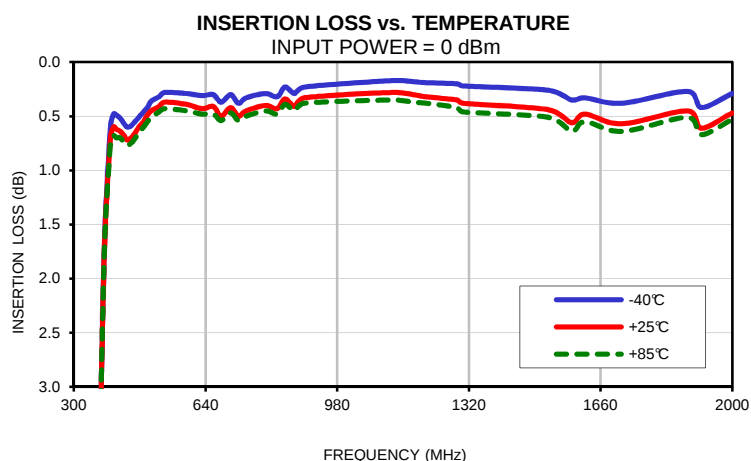
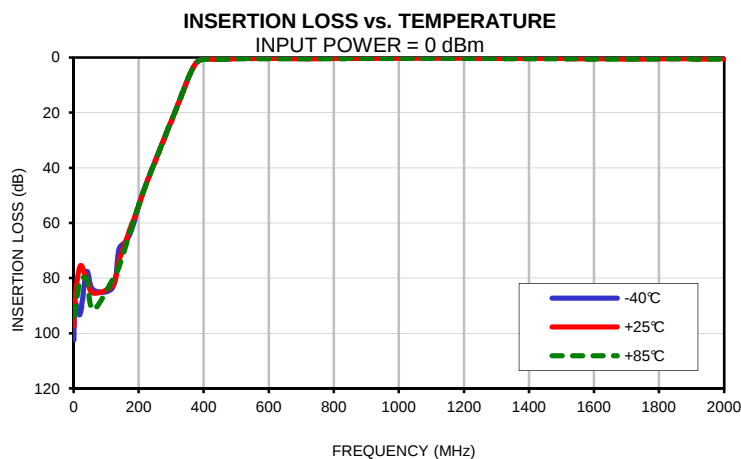
Typical Performance Data

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	102.39	97.34	93.82	0.00	0.00	0.00	0.01	0.00	0.00
4	89.09	87.90	92.73	0.01	0.01	0.00	0.01	0.03	0.01
20	93.03	75.63	80.80	0.01	0.01	0.00	0.01	0.00	0.00
40	77.74	80.30	80.27	0.01	0.00	0.00	0.00	0.00	0.01
60	84.26	85.41	91.45	0.01	0.02	0.01	0.01	0.01	0.03
120	83.40	82.55	80.49	0.02	0.04	0.05	0.00	0.03	0.05
140	69.34	73.50	75.71	0.03	0.05	0.07	0.01	0.05	0.06
160	66.95	66.69	68.50	0.04	0.08	0.09	0.03	0.07	0.09
180	61.87	60.24	60.93	0.07	0.10	0.12	0.04	0.08	0.11
200	53.66	53.86	53.49	0.09	0.13	0.15	0.05	0.11	0.14
210	49.93	50.30	50.13	0.11	0.14	0.17	0.09	0.14	0.17
230	43.76	43.82	43.80	0.13	0.18	0.21	0.09	0.16	0.20
260	34.80	34.90	34.81	0.21	0.25	0.28	0.16	0.23	0.27
280	28.97	28.99	28.94	0.25	0.31	0.34	0.20	0.29	0.34
290	25.98	25.99	25.94	0.29	0.34	0.38	0.25	0.34	0.37
310	20.27	20.28	20.22	0.37	0.45	0.50	0.35	0.45	0.49
330	14.26	14.26	14.18	0.61	0.70	0.77	0.57	0.70	0.77
340	11.23	11.21	11.13	0.87	0.97	1.05	0.84	0.98	1.06
350	8.29	8.27	8.18	1.36	1.50	1.61	1.34	1.52	1.62
360	5.49	5.46	5.40	2.38	2.59	2.75	2.35	2.59	2.73
370	3.16	3.16	3.13	4.32	4.66	4.93	4.25	4.62	4.89
380	1.59	1.63	1.64	8.01	8.55	9.00	7.85	8.43	8.83
395	0.58	0.69	0.74	20.28	22.29	23.90	19.02	20.52	21.47
403	0.48	0.60	0.68	30.32	28.32	26.68	25.38	24.72	23.76
410	0.49	0.62	0.70	19.94	19.07	18.59	19.47	18.74	18.24
420	0.52	0.64	0.70	15.49	15.12	14.94	15.44	15.13	14.93
430	0.57	0.68	0.75	13.77	13.59	13.52	13.80	13.69	13.59
438	0.60	0.72	0.77	13.23	13.13	13.09	13.27	13.24	13.19
448	0.59	0.70	0.75	13.06	13.07	13.06	13.14	13.21	13.18
455	0.56	0.67	0.72	13.21	13.27	13.32	13.30	13.42	13.46
470	0.50	0.59	0.64	14.03	14.26	14.33	14.15	14.46	14.50
480	0.46	0.55	0.60	14.90	15.25	15.34	15.00	15.42	15.50
490	0.42	0.49	0.55	15.95	16.39	16.51	16.00	16.58	16.66
500	0.36	0.45	0.51	17.15	17.75	17.88	17.21	17.87	17.98
520	0.32	0.41	0.46	19.78	20.47	20.57	19.50	20.19	20.33
535	0.28	0.37	0.43	21.17	21.59	21.52	20.55	20.87	20.84
590	0.29	0.39	0.45	18.44	17.91	17.68	17.70	17.19	17.02
630	0.31	0.43	0.48	16.46	15.90	15.76	15.92	15.39	15.26
660	0.30	0.41	0.48	15.69	15.14	15.06	15.31	14.76	14.68
680	0.37	0.50	0.54	15.48	14.92	14.92	15.15	14.61	14.56
705	0.30	0.42	0.47	15.35	14.85	14.89	15.10	14.60	14.60
725	0.38	0.50	0.54	15.38	14.91	15.01	15.17	14.72	14.73
745	0.33	0.45	0.50	15.52	15.15	15.25	15.34	14.94	15.00
795	0.29	0.40	0.45	16.30	16.02	16.15	16.24	15.92	15.98
825	0.32	0.43	0.48	17.01	16.80	17.00	17.01	16.77	16.86
845	0.23	0.34	0.39	17.56	17.39	17.67	17.61	17.44	17.51
870	0.29	0.41	0.45	18.36	18.32	18.65	18.47	18.38	18.53
895	0.23	0.33	0.38	19.30	19.37	19.75	19.46	19.52	19.70
1125	0.17	0.28	0.35	32.80	27.46	26.44	34.60	28.08	26.99
1175	0.18	0.30	0.37	27.73	23.85	22.83	27.57	23.89	23.02
1210	0.19	0.32	0.38	25.34	21.95	21.15	25.24	21.95	21.28
1290	0.20	0.35	0.42	21.08	18.82	18.32	21.09	18.82	18.36
1305	0.22	0.38	0.46	20.47	18.35	17.86	20.47	18.36	17.93
1525	0.26	0.44	0.51	16.43	14.80	14.66	16.59	14.88	14.72
1585	0.35	0.56	0.64	15.87	14.41	14.37	16.05	14.50	14.48
1620	0.33	0.48	0.55	15.48	14.24	14.23	15.73	14.34	14.35
1715	0.38	0.57	0.64	15.17	14.05	14.21	15.43	14.23	14.35
1885	0.27	0.45	0.51	15.81	14.80	15.14	16.39	15.11	15.41
1920	0.42	0.61	0.67	15.87	15.13	15.68	16.46	15.51	16.02
2000	0.29	0.47	0.53	16.44	16.12	16.76	17.00	16.53	17.22

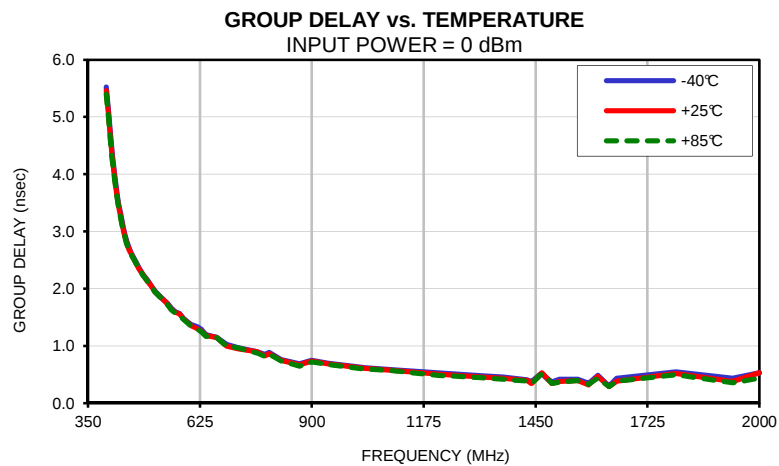
Typical Performance Data

FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
395	5.52	5.46	5.40
400	5.11	5.05	5.00
405	4.72	4.65	4.60
410	4.35	4.28	4.23
415	4.00	3.95	3.91
420	3.74	3.68	3.65
425	3.50	3.46	3.44
430	3.31	3.27	3.24
435	3.13	3.09	3.07
440	2.97	2.94	2.93
445	2.83	2.80	2.78
450	2.73	2.70	2.69
455	2.64	2.62	2.60
465	2.51	2.49	2.49
475	2.37	2.35	2.35
485	2.25	2.24	2.23
495	2.17	2.15	2.15
505	2.06	2.05	2.04
515	1.95	1.94	1.94
535	1.81	1.81	1.80
545	1.75	1.74	1.72
555	1.66	1.64	1.63
565	1.60	1.59	1.58
575	1.57	1.56	1.54
585	1.48	1.47	1.46
595	1.42	1.41	1.40
605	1.37	1.35	1.34
620	1.33	1.30	1.29
630	1.28	1.26	1.24
640	1.20	1.18	1.17
665	1.15	1.15	1.15
690	1.03	1.00	1.00
720	0.97	0.95	0.97
765	0.90	0.90	0.88
785	0.85	0.83	0.82
795	0.89	0.87	0.86
825	0.76	0.75	0.74
870	0.69	0.67	0.65
900	0.75	0.74	0.72
940	0.70	0.69	0.68
1030	0.62	0.61	0.60
1095	0.59	0.58	0.57
1210	0.53	0.51	0.49
1315	0.48	0.46	0.45
1370	0.46	0.44	0.42
1430	0.41	0.40	0.39
1440	0.38	0.35	0.35
1460	0.50	0.49	0.48
1465	0.52	0.53	0.51
1480	0.42	0.42	0.42
1490	0.37	0.35	0.35
1510	0.42	0.38	0.37
1553	0.42	0.40	0.40
1580	0.35	0.32	0.33
1603	0.49	0.47	0.44
1630	0.30	0.29	0.29
1650	0.44	0.39	0.39
1795	0.55	0.52	0.50
1935	0.44	0.38	0.36
2000	0.53	0.53	0.44

Typical Performance Curves

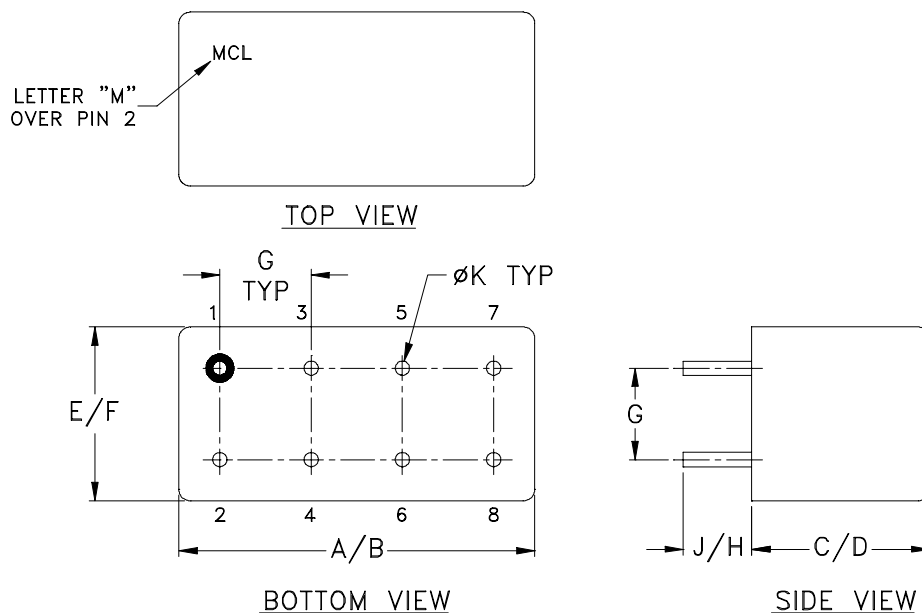


Typical Performance Curves



A01
A04
A05
A06

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01	.770 (19.56)	.800 (20.32)	.385 (9.78)	.400 (10.16)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	5.2
A04			.200 (5.08)	.210 (5.33)							3.7
A05			.240 (6.10)	.250 (6.35)							3.7
A06			.285 (7.24)	.310 (7.87)							5.2

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

Notes:

- Header material: C.R.S.
Pin material: #52 alloy.
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Insulated spacer available. Request P/N B14-045-01.
- Tolerance on pin diameter $\pm .005$ inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.



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Mini-Circuits ISO 9001 & ISO 14001 Certified



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
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, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A



Environmental Specifications ENV01

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
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D