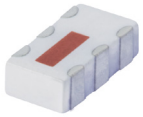
CERAMIC

Dual Low Pass Filter LFCN-291-1PM+

50Ω DC to 290 MHz

THE BIG DEAL

- Differential operation
- Small size, 1206
- Wide stopband, up to 2000 MHz without re-entry
- Good power handling, 2W
- Balanced input-balanced output
- Temperature stable



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

+RoHS Compliant

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

APPLICATIONS

- Harmonic rejection
- VHF/UHF transmitters/receivers
- Lab use
- Used with PMC-Sierra's PM8910/11/12/13

PRODUCT OVERVIEW

Mini-Circuits' LFCN-291-1PM+ is dual low pass filter which can function as differential low pass filter with a passband from DC to 290 MHz. This model is ideal for applications requiring filtering of balanced signals on dual 50Ω lines such as DACs/ADCs, systems with very low noise requirements and more. The filter provides low insertion loss in the passband, fast roll off in the transition, and a very wide stopband without re-entry up to 2000 MHz, making it suitable for use in wideband systems with many harmonics and spurious products. The unit comes housed in a tiny, rugged 1206 ceramic package, with wraparound terminations for excellent solderability.

KEY FEATURES

Features	Advantages
Differential filter	Allows filtering of balanced signals in a single, tiny component. Eliminates the need for binning and matching of separate discrete components
Tiny size (0.126 x 0.063 x 0.035")	Saves space in dense circuit board layouts and minimizes the effects of parasitics
Fast roll off	Provides sharp rejection at frequencies close to the passband.
Wide stopband	Provides excellent rejection over more than a decade of bandwidth, ideal for blocking harmonics in wideband test and measurement or communications systems
Wrap-around terminations	Provides excellent solderability and easy visual inspection.
Wide operating temperature range, -55 to +125°C	Enables reliable performance in extreme environments.

REV. C
ECO-021374
LFCN-291-1PM+
EDU4072
URJ/NY
240403

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50Ω DC to 290 MHz

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC - 290	—	2.0	3.5	dB
	Freq. Cut-Off	F2*	325	—	3.0	—	dB
	Return Loss	DC-F1	DC - 290	—	20	—	dB
Stop Band	Rejection Loss	F3	460	20	—	—	dB
		F4-F5	600 - 2000	37	45	—	dB

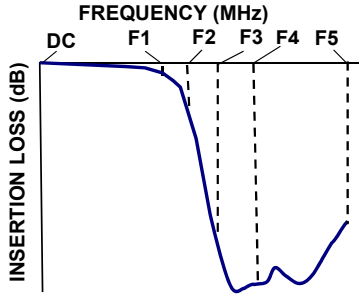
1 DC de-coupling capacitors are required in Applications where DC voltage and/or current is present at either input or output ports. Please contact Mini-Circuits for alternatives if DC pass from IN-OUT is required.
2 Measured on Mini-Circuits Characterization Test Board TB-255+
* Typically, a ±5% frequency deviation from the stated value may occur on a unit-to-unit basis.

MAXIMUM RATINGS

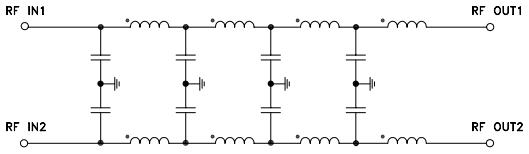
Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input*	2 W max. @25°C

*Passband rating, derate linearly to 0.4W at 125°C ambient
Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



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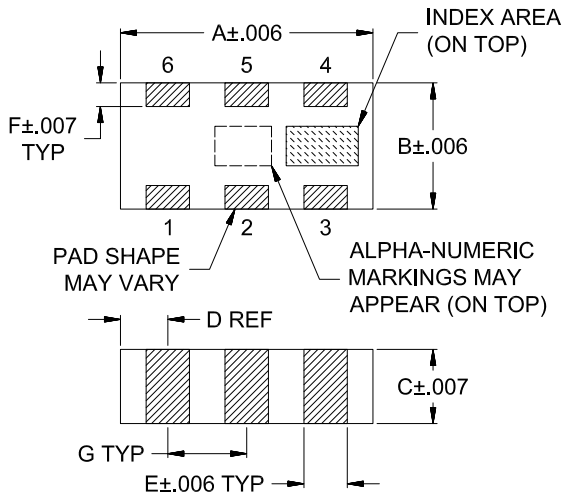
50Ω DC to 290 MHz

PAD CONNECTIONS

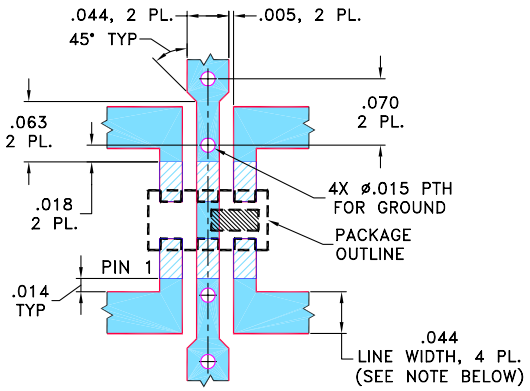
RF IN1, RF IN2	1,6
RF OUT1, RF OUT2	3,4
GROUND	2,5

OUTLINE DRAWING



PRODUCT MARKING: BQ

DEMO BOARD MCL P/N: TB-255+
SUGGESTED PCB LAYOUT (PL-131)



NOTES: 1.TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2.BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F	G	Wt.
.126	**.063**	**.035**	**.024**	**.022**	**.011**	**.039**	grams
3.20	1.60	0.89	0.61	0.56	0.28	0.99	.020

Note. Please refer to case style drawing for details

TAPE & REEL INFORMATION: F75

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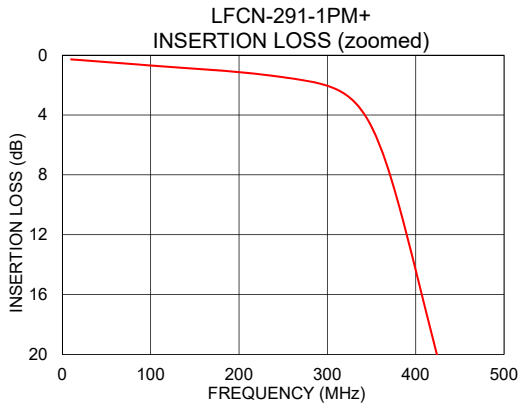
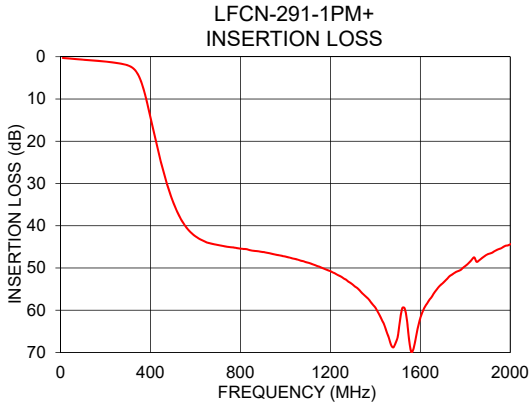
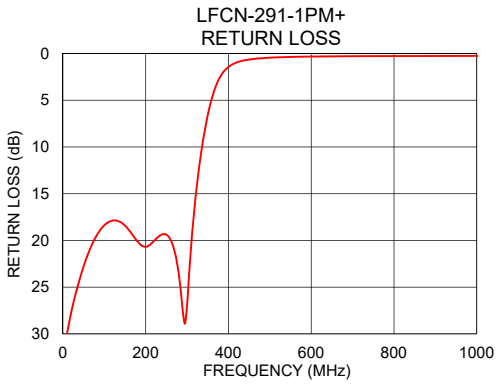
TYPICAL PERFORMANCE DATA AND CHARTS AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	0.29	29.93
50	0.46	22.76
100	0.69	18.37
290	1.88	27.74
325	2.83	13.59
330	3.09	11.85
460	27.66	0.58
480	31.25	0.50
500	34.31	0.44
600	42.51	0.32
700	44.56	0.28
1000	47.30	0.25
1500	66.15	0.23
1800	49.54	0.22
2000	44.41	0.23







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

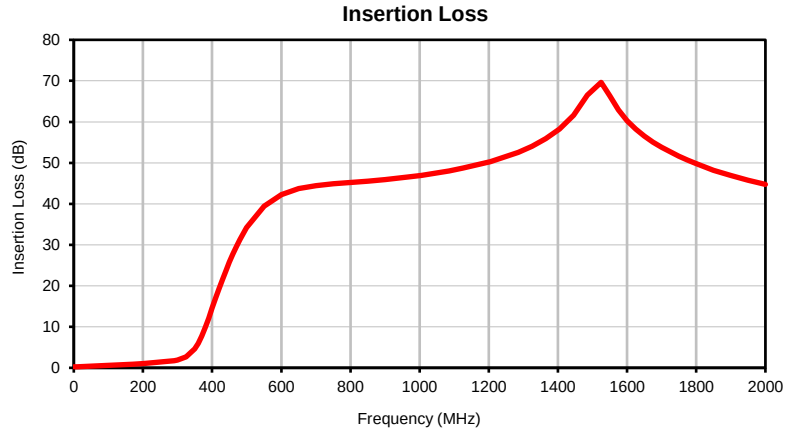
Dual Low Pass Filter LFCN-291-1PM+

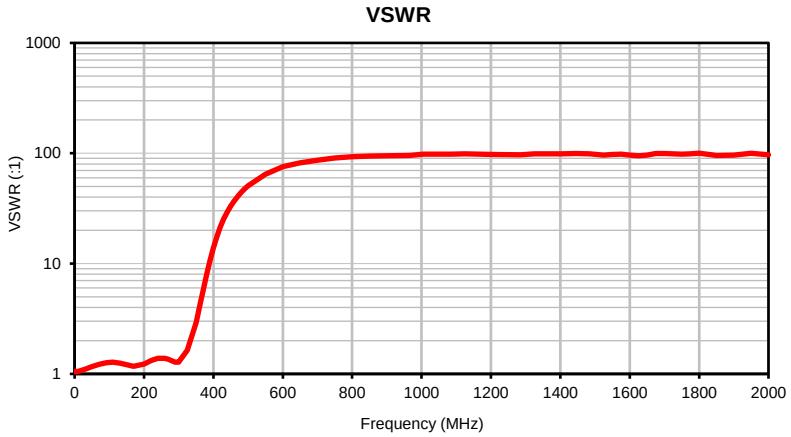
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)
0.3	0.24	1.05
0.5	0.25	1.05
0.7	0.25	1.05
1	0.25	1.05
4	0.25	1.05
7	0.25	1.05
10	0.26	1.05
30	0.33	1.10
50	0.41	1.16
70	0.50	1.22
90	0.59	1.26
110	0.67	1.28
130	0.74	1.26
150	0.80	1.21
170	0.87	1.17
200	1.02	1.22
220	1.16	1.32
240	1.31	1.39
260	1.47	1.39
270	1.56	1.36
290	1.76	1.28
300	1.92	1.28
325	2.67	1.64
350	4.61	2.93
360	5.99	4.00
370	7.75	5.59
380	9.83	7.78
390	12.13	10.60
400	14.52	13.92
410	16.93	17.58
420	19.30	21.46
430	21.58	25.38
440	23.75	29.30
450	25.81	33.20
460	27.74	36.95
470	29.55	40.61
480	31.22	44.05
490	32.77	47.43
500	34.17	50.62
550	39.43	64.49
600	42.27	75.67
650	43.69	81.72
700	44.41	86.59
750	44.88	90.72
800	45.21	93.17
850	45.54	94.07
900	45.91	94.89
965	46.51	95.32
1005	46.95	97.99
1085	48.02	98.22
1125	48.69	99.08
1205	50.29	97.61
1285	52.56	97.07
1325	54.03	98.84
1365	55.88	99.01
1405	58.25	98.63
1445	61.62	99.65
1485	66.49	98.47
1525	69.63	96.37
1550	66.39	97.46
1575	62.95	97.93
1600	60.27	95.96
1625	58.21	94.96
1650	56.52	96.45
1675	55.06	99.55
1700	53.79	99.77
1725	52.67	98.76
1750	51.63	98.18
1775	50.66	98.58
1800	49.79	99.93
1850	48.21	95.71
1900	46.92	96.40
1950	45.76	99.96
2000	44.75	96.93

Dual Low Pass Filter LFCN-291-1PM+

Typical Performance Curves

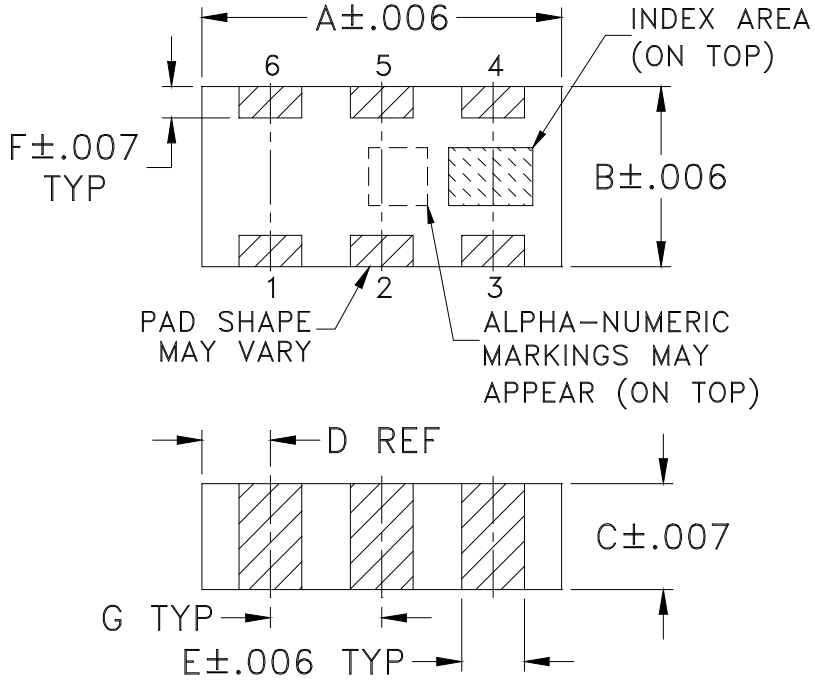




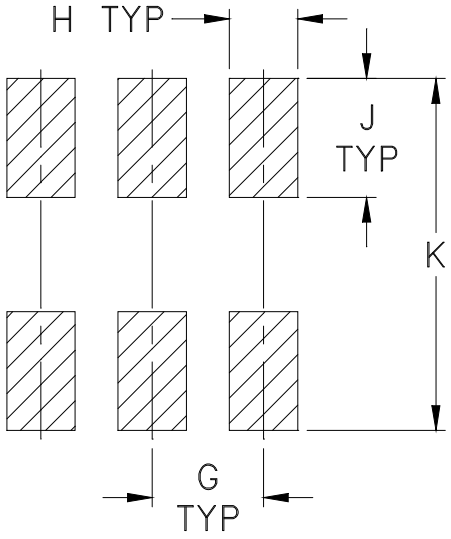
Case Style FV

FV1206-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	-- --	-- --	-- --	-- --	.020

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. Termination finish: **as shown below or indicated on Data Sheet.**
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

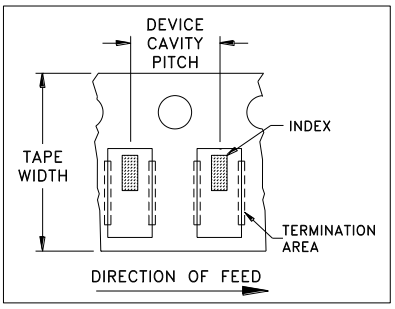


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

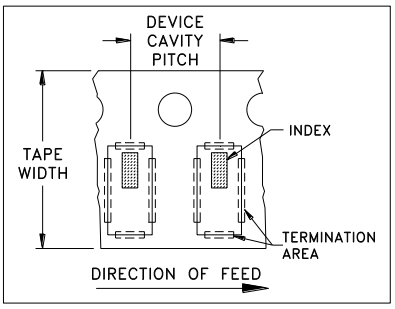


ILLUSTRATION 2

Applicable Case Styles
FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

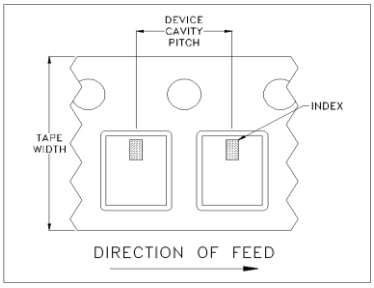


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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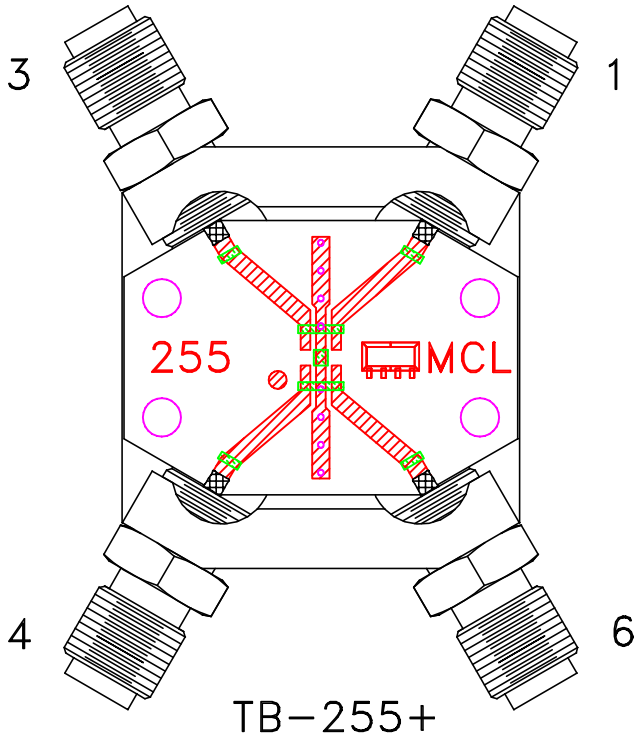
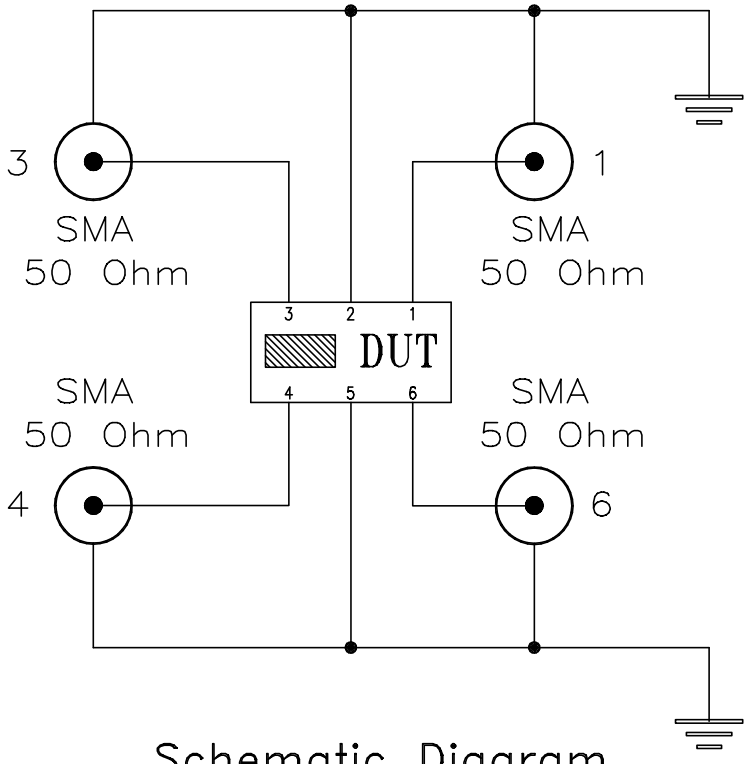
Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



TB-255+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV126

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 125° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° 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
Solder Reflow Heat	Sn-Pb Eutectic Process 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020C, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
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