Surface Mount

RF Transformer

TRS1.33-132-75+

75Ω 25 to 1300 MHz

CASE STYLE:AT577-2

The Big Deal

- Wideband, 25 to1300 MHz
- Low insertion loss, 1.0 dB typ.
- Good return loss, 20 dB typ.

Product Overview

The TRS1.33-132-75+ is a 75Ω surface mount transformer with a 1.33 secondary/primary impedance ratio covering the 25 to 1300 MHz band, meeting requirements for DOCSIS® 3.1 compliant systems and equipment, among other applications. This model provides low insertion loss, excellent input return loss and low phase and amplitude unbalance. Featuring core and wire, all-welded construction, the unit measures 0.2 x 0.2 x 1.5”, accommodating dense layouts. It also includes Mini-Circuits’ Top Hat™ feature for faster more accurate pick-and-place assembly.

Feature	Advantages
Wide bandwidth, 25-1300 MHz	Wideband range covers CATV signal requirements meeting DOCSIS 3.1 standards.
Good input return loss, 20 dB typ.	Excellent matching for 75Ω systems.
Small footprint, 0.2 x 0.2”	Accommodates tight space requirements for dense PCB layouts.

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

Surface Mount top hat®

RF Transformer

TRS1.33-132-75+

75Ω 25 to 1300 MHz

HS

CASE STYLE:AT577-2

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.5W
DC Current	30mA

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

Pin Connections

PRIMARY DOT	1
PRIMARY	3
SECONDARY DOT	4
SECONDARY	6
NOT USED	2,5

Features

- wideband, 25 to 1300 MHz
- good return loss
- flat insertion loss

Applications

- impedance matching
- balanced to unbalanced transformer
- push-pull amplifiers
- CATV

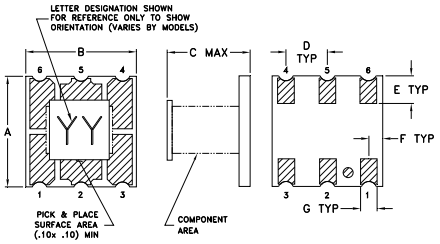
+RoHS Compliant

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

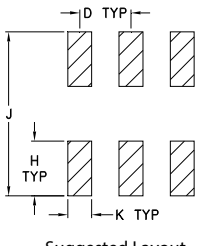
Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	500
13"	2000

Outline Drawing



PCB Land Pattern

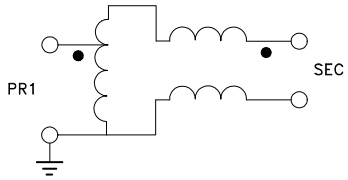


Outline Dimensions (inch / mm)

A	B	C	D	E	F
.200	.200	.15	.075	.050	.025
5.08	5.08	3.81	1.91	1.27	0.64

G	H	J	K	wt
.030	.080	.240	.035	grams
0.76	2.03	6.10	0.89	0.15

Config. P



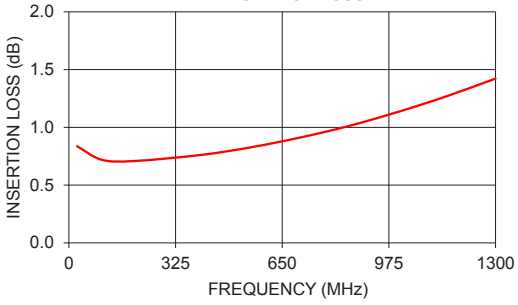
Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/primary)			1.33		Ohm
Frequency Range		25	—	1300	MHz
Insertion Loss	25 - 1300	—	1.0	2.0	dB
Amplitude Unbalance	25 - 1300	—	0.8	—	dB
Phase Unbalance	25 - 1300	—	6	—	Degree

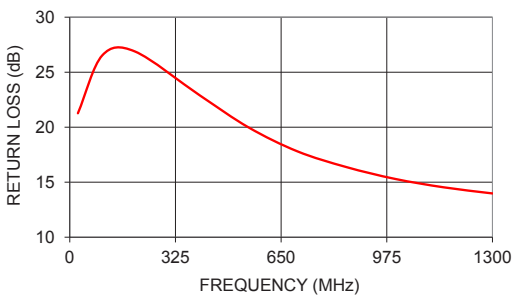
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
25	0.84	21.26	1.05	4.53
100	0.72	26.53	0.86	0.62
200	0.71	26.89	0.78	1.21
400	0.76	22.89	0.60	3.69
550	0.83	19.98	0.43	4.91
700	0.91	17.81	0.19	5.92
850	1.01	16.38	0.04	6.88
1000	1.13	15.30	0.29	7.32
1150	1.27	14.53	0.55	7.34
1300	1.42	13.98	0.80	7.05

TRS1.33-132-75+
INSERTION LOSS



TRS1.33-132-75+
INPUT RETURN LOSS



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RF Transformer TRS1.33-132-75+

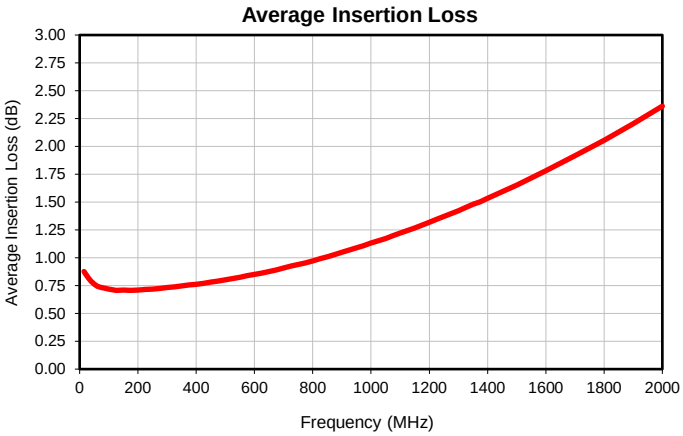
Typical Performance Data

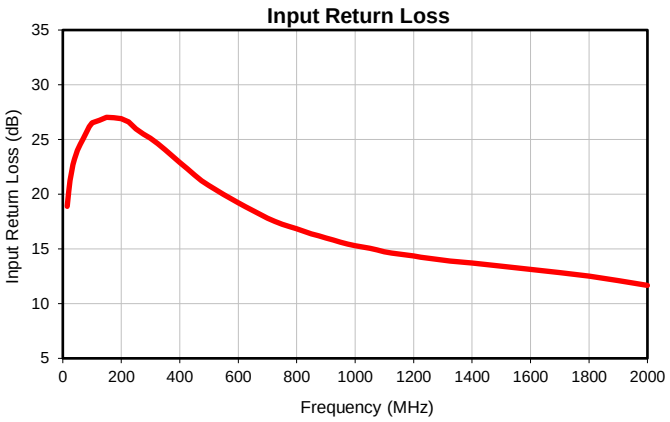
FREQUENCY MHz	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
15	0.88	18.88	1.12	7.03
20	0.86	20.26	1.08	5.48
25	0.84	21.26	1.05	4.53
30	0.82	22.05	1.03	3.86
35	0.80	22.68	1.00	3.36
40	0.79	23.21	0.97	2.99
45	0.77	23.65	0.95	2.66
50	0.76	24.01	0.94	2.37
60	0.75	24.57	0.91	1.87
70	0.74	25.06	0.89	1.45
80	0.73	25.63	0.88	1.10
90	0.73	26.16	0.88	0.82
100	0.72	26.53	0.86	0.62
125	0.71	26.76	0.83	0.08
150	0.71	27.03	0.82	0.45
175	0.71	26.99	0.79	0.84
200	0.71	26.89	0.78	1.21
225	0.72	26.62	0.77	1.59
250	0.72	25.98	0.73	1.85
275	0.72	25.49	0.72	2.12
300	0.73	25.11	0.71	2.46
325	0.74	24.62	0.70	2.80
350	0.75	24.06	0.67	3.15
375	0.75	23.47	0.64	3.44
400	0.76	22.89	0.60	3.69
425	0.77	22.33	0.57	3.91
450	0.78	21.76	0.54	4.09
475	0.79	21.23	0.51	4.26
500	0.80	20.78	0.49	4.47
525	0.81	20.38	0.46	4.69
550	0.83	19.98	0.43	4.91
575	0.84	19.59	0.39	5.14
600	0.85	19.21	0.35	5.35
625	0.86	18.86	0.31	5.48
650	0.88	18.52	0.27	5.63
675	0.89	18.16	0.23	5.78
700	0.91	17.81	0.19	5.92
725	0.92	17.50	0.17	6.11
750	0.94	17.26	0.13	6.27
775	0.95	17.06	0.09	6.44
800	0.97	16.84	0.05	6.61
825	0.99	16.61	0.00	6.75
850	1.01	16.38	0.04	6.88
875	1.03	16.19	0.09	6.95
900	1.05	16.00	0.13	7.00
925	1.07	15.81	0.17	7.09
950	1.09	15.62	0.21	7.20
975	1.11	15.44	0.25	7.26
1000	1.13	15.30	0.29	7.32
1025	1.15	15.18	0.34	7.38
1050	1.17	15.05	0.38	7.44
1075	1.20	14.90	0.43	7.47
1100	1.22	14.75	0.47	7.42
1125	1.25	14.63	0.51	7.37
1150	1.27	14.53	0.55	7.34
1175	1.29	14.44	0.59	7.37
1200	1.32	14.34	0.63	7.36
1225	1.34	14.24	0.67	7.32
1250	1.37	14.14	0.72	7.23
1275	1.40	14.07	0.76	7.17
1300	1.42	13.98	0.80	7.05
1325	1.45	13.90	0.83	6.90
1350	1.48	13.83	0.87	6.76
1375	1.50	13.77	0.92	6.65
1400	1.53	13.71	0.95	6.59
1500	1.65	13.43	1.11	5.95
1600	1.78	13.12	1.25	5.11
1700	1.92	12.83	1.36	4.12
1800	2.06	12.51	1.45	2.94
1900	2.20	12.12	1.52	1.66
2000	2.36	11.67	1.55	0.19

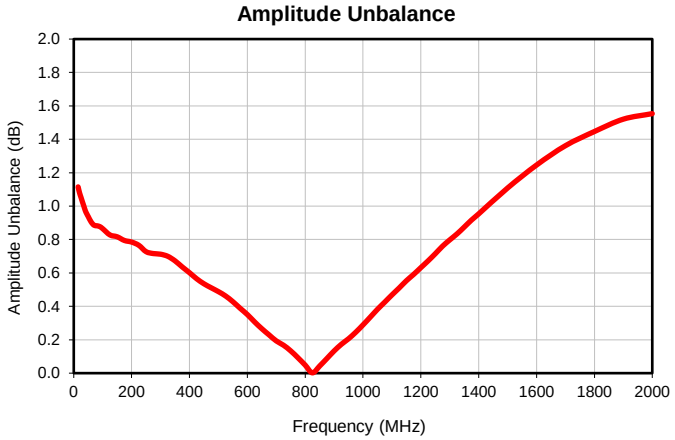
RF Transformer

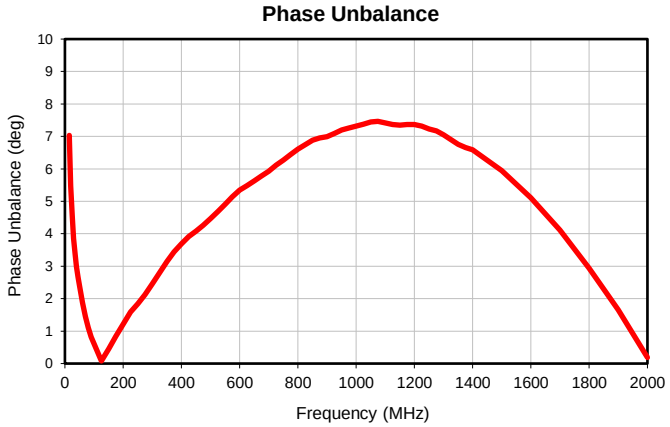
TRS1.33-132-75+

Typical Performance Data







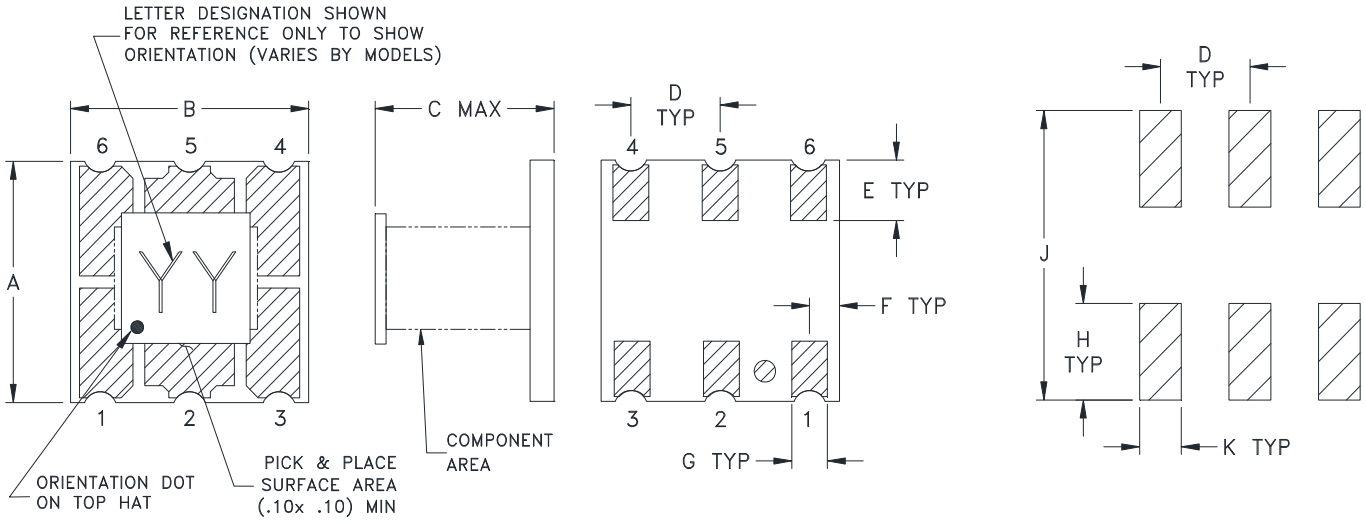


Case Style AT

Outline Dimensions

AT577-2

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT577-2	.200 (5.08)	.200 (5.08)	.15 (3.81)	.075 (1.91)	.050 (1.27)	.025 (0.64)	.030 (0.76)	.080 (2.03)	.240 (6.10)	.035 (0.89)	-- --	.15

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

Notes:

1. Base material: Printed wiring laminate.
2. Termination finish:
   For RoHS Case Style: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate.
   For RoHS-5 Case Style: Tin-Lead plate. All models, no (+) suffix.
3. Orientation Dot on Top Hat & Marking on the Substrate both refers to Pin #1 of the Unit.

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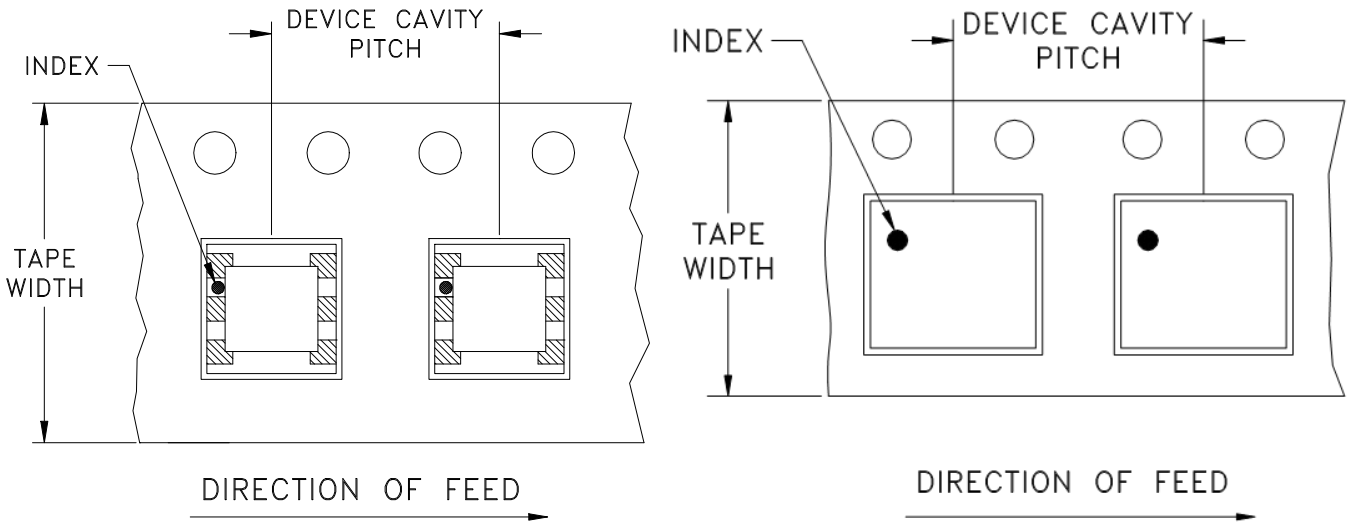
Tape & Reel Packaging TR-F73

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	8	7	Small quantity standards (see note)	20
				50
				100
				200
				500
		13	Standard	1000
				2000

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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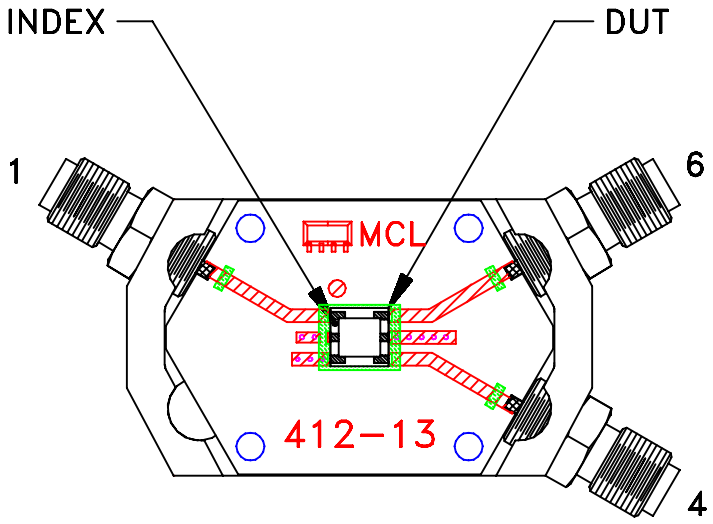
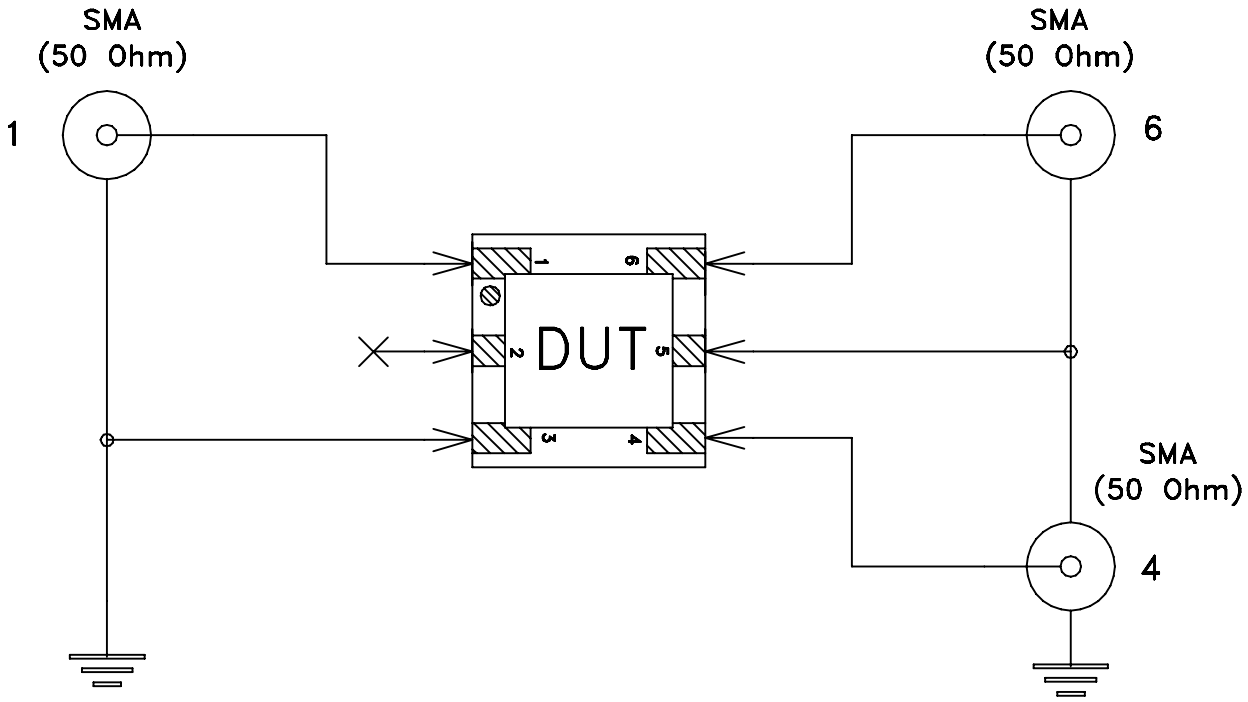
Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



TB-575+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.020 inch.

Mini-Circuits®

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Environmental Specifications ENV02T1

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	-40° to 85°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
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 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
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

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