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1.0 OBJECTIVE

THIS SPECIFICATION DEFINES THE PERFORMANCE, TEST, QUALITY AND RELIABILITY REQUIREMENTS OF THE USB (UNIVERSAL SERIAL BUS) INCLUDING THE FOLLOWING:

SERIES "A" RIGHT ANGLE SINGLE DECK
 SERIES "A" RIGHT ANGLE SINGLE DECK WITH SENSOR PIN
 SERIES "A" RIGHT ANGLE DOUBLE DECK
 SERIES "A" SMT SINGLE DECK
 SERIES "A" PLUG

2.0 SCOPE

THIS SPECIFICATION IS APPLICABLE TO THE TERMINATION CHARACTERISTICS OF THE USB FAMILY OF PRODUCTS WHICH PROVIDES INTERCONNECTION OF COMPUTER PERIPHERALS

3.0 GENERAL: THIS DOCUMENT IS COMPOSED OF THE FOLLOWING SECTIONS:

<u>PARAGRAPH</u>	<u>TITLE</u>
1.	OBJECTIVE
2.	SCOPE
3.	GENERAL
4.	APPLICABLE DOCUMENTS
5.	REQUIREMENTS
5.1	QUALIFICATION
5.2	PRODUCT EXAMINATION
5.3	MATERIAL
5.4	FINISH
5.5	DESIGN AND CONSTRUCTION
6.	ELECTRICAL CHARACTERISTICS
7.	MECHANICAL CHARACTERISTICS
8.	ENVIRONMENTAL CHARACTERISTICS
9.	QUALITY ASSURANCE PROVISIONS
9.1	EQUIPMENT CALIBRATION

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9.2	INSPECTION CONDITIONS
9.3	SAMPLES QUANTITY AND DESCRIPTION
9.4	ACCEPTANCE
9.5	QUALIFICATION TESTING
9.6	RE-QUALIFICATION TESTING
FIGURE 1	CONTACT RESISTANCE MEASUREMENT POINTS TYPICAL
FIGURE 2	VIBRATIONS AND PHYSICAL SHOCK MOUNTING FIXTURE
TABLE 1	QUALIFICATION TESTING AND SEQUENCE MATRIX

4.0 APPLICABLE DOCUMENTS

4.1 SPECIFICATIONS:

4.1.1 ENGINEERING DRAWINGS

<u>SERIES "A"</u>	SINGLE DECK RECEPTACLES:
87520	THROUGH HOLE
87583	SURFACE MOUNT W/THROUGH HOLE CLAWS
72313	SENSOR PIN THROUGH HOLE
72367	SENSOR PIN SURFACE MOUNT W/THROUGH HOLE CLAWS
72507	SENSOR PIN SURFACE MOUNT W/SURFACE MOUNT TABS
73725	SIDE MOUNT
74612/56434/52369	SMT SPECIAL SHIELD
74552	THROUGH HOLE REVERSED
74626	SURFACE MOUNT REVERSED
74510	SMT WITH TOP SCREW MOUNT
61819	STAND SOLDED TAIL THROUGH HOLE WITH TOP SCREW MOUNT
74056	SHORT SOLDED TAIL THROUGH HOLE WITH TOP SCREW MOUNT
52469	SIDE MOUNT SHORT BODY
52319/57422/57423,	
54006/54026	SIDE MOUNT SHORT BODY
<u>SERIES "A"</u>	DOUBLE DECK RECEPTACLES:
72309	THROUGH HOLE
<u>SERIES "A" PLUG</u>	
74033	FULLY RATED
74032	SUB-CHANNEL

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4.2 MILITARY STANDARDS

- | | |
|-----------------------|---|
| 4.2.1. MIL-STD-202F: | TEST METHODS FOR ELECTRONIC COMPONENT PARTS |
| 4.2.2. MIL-STD-1344A: | TEST METHODS FOR ELECTRICAL CONNECTORS |
| 4.2.3. MIL-C-45662: | EQUIPMENT CALIBRATION |

4.3 FEDERAL SPECIFICATIONS

- | | |
|------------------|-----------------------------------|
| 4.3.1. QQ-N-290: | NICKEL PLATING (ELECTRODEPOSITED) |
| 4.3.2. QQ-B-750: | PHOSPHOR BRONZE ALLOY STRIP |
| 4.3.3. QQ-S-571 | SOLDER |

4.4 OTHER STANDARDS AND SPECIFICATIONS

- | | |
|--|---|
| 4.4.1 UL94: | FLAMMABILITY |
| 4.4.2 ASTM B-103: | PHOSPHOR BRONZE |
| 4.4.3 ISO 9000: | |
| 4.4.4 EIA 364: | ELECTRICAL CONNECTOR/SOCKET TEST
PROCEDURES INCLUDING ENVIRONMENTAL
CLASSIFICATIONS |
| 4.4.5 ASTM-D-4565: | PHYSICAL AND ENVIRONMENTAL PERFORMANCE
PROPERTIES OF INSULATION AND JACKET FOR
TELECOMMUNICATIONS WIRE AND CABLE, TEST
STANDARD METHOD |
| 4.4.6 ASTM-D-4566: | ELECTRICAL PERFORMANCE PROPERTIES OF
ISULATION AND JECKET FOR TELECOMMUNICATION
WIRE AND CABLE
TEST STANDARD METHOD |
| 4.4.7 USB UNIVERSAL SERIAL BUS SPECIFICATION | |

4.5 FCI SPECIFICATIONS

- | | |
|-------------------|--|
| 4.5.1 BUS-03-114: | CAPACITANCE MEASUREMENT |
| 4.5.2 BUS-03-404: | NORMAL FORCE MEASUREMENT |
| 4.5.3 BUS-03-405: | INSERTION/WITHDRAWAL FORCE MEASUREMENT |
| 4.5.4 BUS-03-601: | CURRENT RATING/30 DEGREES TEMPERATURE RISE |
| 4.5.5 BUS-16-016: | PHOSPHOR BRONZE STRIP |
| 4.5.6 BUS-16-074: | PCT, 30% GLASS |
| 4.5.7 BUS-19-002: | SOLDERABILITY |
| 4.5.8 BUS-19-020: | POROSITY |

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- 4.5.9 BUS-19-040: PLATING ADHESION
- 4.6.0 BUS-19-002: SURFACE MOUNT SOLDER JOINT RELIABILITY
- 4.6.1 BUS-19-122: SOLDER JOINT RELIABILITY TEST PROCEDURE FOR SURFACE MOUNT CONNECTORS

5.0 REQUIREMENTS

5.1 QUALIFICATION

CONNECTORS FURNISHED UNDER THIS SPECIFICATION SHALL BE CAPABLE OF MEETING THE QUALIFICATION TEST REQUIREMENTS SPECIFIED HEREIN.

5.2 PRODUCT EXAMINATION

PRODUCT WILL BE EXAMINED PER EIA-364-18 VERIFYING VISUALLY PARAGRAPHS 5.3, 5.4 AND 5.5. DIMENSIONAL EXAMINATION IS NOT REQUIRED.

5.3 MATERIAL

MATERIAL FOR EACH PART SHALL BE SPECIFIED HEREIN, OR EQUIVALENT, SUBSTITUTE MATERIAL SHALL MEET THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION.

5.3.1 RECEPTACLE TERMINAL; THE BASE MATERIAL SHALL BE PHOSPHOR-BRONZE STRIP

5.3.2 RECEPTACLE INSULATOR HOUSINGS; CONNECTORS SHALL BE MOLDED OF PLASTIC THAT IS RATED UL94-V-0 OR BETTER IN ACCORDANCE WITH UL-94.

5.3.3 RECEPTACLE SHELL; THE BASE MATERIAL SHALL BE PHOSPHOR-BRONZE STRIP.

5.3.4 INSULATOR HOUSINGS AND COVERS OF LEAD FREE PART - THE INSULATOR HOUSINGS AND COVERS OF LEAD FREE PART WILL WITHSTAND EXPOSURE TO 260°C PEAK TEMPERATURE FOR 40 SECONDS IN A CONVECTION, INFRA-RED OR VAPOUR PHASE REFLOW OVEN.

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5.3.5 LEAD FREE PART - ALL LEAD FREE PARTS ARE COMPATIBLE WITH ROHS.

5.4 FINISH

5.4.1 RECEPTACLE TERMINAL SHALL BE PLATED IN THE CONTACT AREA

WITH 0.76um (30u"INCHES) PALLADIUM NICKEL WITH GOLD FLASH MINIMUM OR 0.76um (30u"INCHES) GOLD OVER 1,27um (50u" INCHES) MINIMUM NICKEL. THE RECEPTACLE TERMINAL SOLDER TAIL SECTIONS SHALL BE PLATED WITH 2,54um (100u"INCHES) 90/10 TIN-LEAD MINIMUM OR 2,54um (100u" INCHES) MINIMUM MATTED TIN FOR LEAD FREE PART OVER 1,27um (50u"INCHES) MINIMUM NICKEL. THE TERMINAL AREAS OUTSIDE OF THE CONTACT AREAS AND THE SOLDER TAIL AREAS SHALL BE PLATED WITH 1,27um (50u"INCHES) NICKEL MINIMUM.

5.4.2 OUTSIDE SEHLL OF THE RECEPTACLE SHALL BE PLATED WITH 2.54um (100u"INCHES) 90/10 TIN-LEAD MINIMUM OR 2.54um (100u"INCHES) MINIMUM PURE TIN OVER 1,27um (50u"INCHES) MINIMUM NICKEL UNDERPLATE.

5.4.3 Lead free plating - ALL PLATING BATH FOR COMPONENTS OF LEAD FREE PART ARE QUALIFIED BY FCI. FCI QUALIFICATION INCLUDES SOLDERABILITY, WHISKERING, SOLDER JOINT RELIABILITY AND TARNISHING EFFECTS.

5.5 DESIGN AND CONSTRUCTION

5.5.1. SINGLE DECK: THE RECEPTACLE CONNECTOR SHALL BE A MULTIPLE PIECE ASSEMBLY HAVING A SINGLE ROWS OF CONTACTS. SPACE ON DISSIMILAR CENTER LINE (THE TWO INNER CONTACTS ARE SPACED 2.0mm APART AND THE TERMINALS ADJACENT TO THESE TERMINALS ARE SPECED 2.5mm AWAY) IN THE INTERFACE AREA. EACH TERMINAL TRANSITION WILL BE A 90 DEGREES BEND TO ALLOW FOR TERMINATION TO THE PC BOARD BY EITHER A THROUGH HOLE LEG OR A SMT LEG. THE OUTSIDE SHELL HAS FOUR RESILIENT CONTACT ARMS (TWO ON TOP AND TOW ON THE BOTTOM) THAT ACT AS ESD GROUNDING AS WELL AS CABLE PLUG RETENTION FEATURES. TWO ADDITIONAL ARMS ON THE SIDE OF THE SHELL ASSURE THAT THERE IS CONSTANT CONTACT BETWEEN THE SHELL AND THE SHELL OF THE CABLE ASSEMBLY PLUG WHILE THE CONNECTORS

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ARE MATED. THE ENTIRE RECEPTACLE ASSEMBLY IS ATTACHED TO THE PRINTED CIRCUIT BOARD VIA RETENTION CLAWS ON THE OUTSIDE SHELL.REFER TO THE CUSTOMER DRAWING FOR RECOMMENDED P.C. BOARD THICKNESS.

5.5.2. DOUBLEDECK (STACKED); THE RECEPTACLE CONNECTOR SHALL BE A MULTIPLE PIECE ASSEMBLY HAVING DOUBLE ROW A OF CONTACTS SPACED ON DISSIMILAR CENTERLINES (THE TWO INNER CONTACTS ARE SPACED 2.0 mm APART AND THE TERMINALS ADJACENT TO THESE TERMINALS ARE SPACED 2.5mm AWAY) IN THE INTERFACE AREA. EACH TERMINAL TRANSITION WILL BE A 90 DEGREE BEND TO ALLOW FOR TERMINATION TO THE PC BOARD BY MEANS OF A THROUGH HOLE LEG. THE SHELL HAS EIGHT RESILIENT CONTACT ARMS (TWO ON TOP, TWO ON THE BOTTOM, AND FOUR INTERNAL) THAT ACT AS ESP GROUNDING AS WELL AS CABLE PLUG RETENTION FEATURES. FOUR ADDITIONAL ARMS ON THE SIDE OF THE SHELL ASSURE THAT THERE IS CONSTANT CONTACT BETWEEN THE RECEPTACLE SHELL AND THE SHELL OF THE MATING CABLE ASSEMBLY PLUG WHILE THE CONNECTORS ARE MATED. THE ENTIRE RECEPTACLE ASSEMBLY IS ATTACHED TO THE PRINTED CIRCUIT BOARD VIA RETENTION CLAWS ON THE OUTSIDE SHELL.REFER TO THE CUSTOMER DRAWING FOR RECOMMENDED P.C. BOARD THICKNESS.

THE RECOMMENDED P.C. BOARD THICKNESS IS 1.57mm (0.062")

5.3.3 MATING; THE CONNECTORS SHALL BE CAPABLE OF MATING AND UNMATING MANUALLY WITHOUT THE USE OF SPECIAL TOOLS.

5.5.4 WORKMANSHIP; CONNECTORS SHALL BE UNIFORM IN QUALITY AND SHALL BE FREE FROM BURRS, SCRATCHES, CRACKS, VOIDS, CHIPS, BLISTERS, PIN HOLES, SHARP EDGES, OTHER DEFECTS, DEBRIS AND ANY INGRESS OF FOREIGN MATERIAL THAT WILL ADVERSELY AFFECT LIFE OR SERVICEABILITY.

5.5.5 TEMPERATURE RATING; THE RECEPTACLE CONNECTOR SHALL BE CAPABLE OF WITHSTANDING A STORAGE TEMPERATURE RANGE OF -55°C TO 85°C AND OPERATING TEMPERATURE RANGE OF -55°C TO 85°C

6.0 ELECTRICAL CHARACTERISTICS

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6.1 LOW LEVEL CONTACT RESISTANCE (LLCR):

- 6.6.1 TEST STANDARD: EIA 364-23
- 6.6.2 ACCEPTANCE CRITERIA: 30m OHM max.
- 6.6.3 CONNECTION METHOD: ATTACH CURRENT AND VOLTAGE LEADS AS SHOWN IN FIGURE 1

6.2 INSULATION RESISTANCE;

- 6.2.1 TEST STANDARD: EIA 364-21
- 6.2.2 ACCEPTANCE CRITERIA: >1000 MEGOHMS, MATED AND UNMATED
- 6.2.3 TEST VOLTAGE: 500 VOLTS DC
- 6.2.4 ELECTRIFICATION TIME: 2 MINUTES
- 6.2.5 MEASUREMENT POINTS: BETWEEN ADJACENT CONTACT AND BETWEEN CONTACTS SHELL

6.3 DIELECTRIC WITHSTANDING VOLTAGE;

- 6.3.1 TEST STANDARD: EIA 364-20, METHOD A
- 6.3.2 ACCEPTANCE CRITERIA: NO EVIDENCE OF ARC-OVER, INSULATION BREAKDOWN, OR EXCESSIVE CURRENT LEAKAGE (> 1mA) MATED AND UNMATED CONNECTORS
- 6.3.3 TEST VOLTAGE: 750 VOLTS AC, 60
- 6.3.4 TEST BAROMETRIC PRESSURE: 760mm Hg, SEA LEVEL

6.4 CURRENT RATING:

- 6.4.1 TEST STANDARD: BUS-03-601
- 6.4.2 ACCEPTANCE CRITERIA: 30 °C MAX. DELTA T ANY POINT.
- 6.4.3 TEST METHODS: FOR 87520/87583/74552/74626 SERIES: PER CONTACT & ALL CONTACT IN SERIES AT 3 A; FOR 73725 SERIES: PER CONTACT & ALL CONTACT IN SERIES AT 2.5A; FOR OTHER USB SERIES: PER CONTACT AT 1.5A; ALL CONTACTS IN SERIES AT 1.0A.
- 6.4.4 AMBIENT CONDITIONS: STILL AIR AT 25 °C.

6.5 CAPACITANCE:

- 6.5.1 TEST STANDARD: EIA 364-30

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6.5.2 ACCEPTANCE CRITERIA:	2 PF MAX.
6.5.3 AMBIENT CONDITIONS:	STILL AIR AT 25 °C.
6.5.4 FREQUENCY:	1 KHZ (DEFAULT 1 MHZ)
6.5.5 POINTS OF MEASUREMENT	BETWEEN ADJACENT CONTACTS IN AN UNMATED CONNECTOR

7.0 MECHANICAL CHARACTERISTICS

7.1 MATING/UNMATING FORCE

7.1.1 TEST STANDARD:	EIA 364-13
7.1.2 ACCEPTANCE CRITERIA:	
7.1.2.1 MATING:	<35.0 N (7.87 Lb) PER PLUG
7.1.2.2 UNMATING:	>10.0 N (2.25 Lb) PER PLUG
7.1.3 CROSS HEAD SPEED:	1 INCH PER MINUTE
7.1.4 MOUNTING:	FREE FLOATING FIXTURES

7.2 CONTACT RETENTION:

7.2.1 TEST STANDARD:	EIA 364-29
7.2.2 ACCEPTANCE CRITERIA:	AXIAL LOAD > 0.5 POUNDS WITHOUT DISLODGING
7.2.3 APPLICATION RATE:	0.2 INCHES/MINUTE

8.0 ENVIRONMENTAL CONDITIONS

ACCEPTANCE CRITERIA: AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTAL CONDITIONS IN ACCORDANCE WITH THE SPECIFIED TEST PROCEDURE AND/OR DETAILS, THE PRODUCT SHALL SHOW NO PHYSICAL DAMAGE AND SHALL MEET THE ELECTRICAL AND MECHANICAL REQUIREMENTS PER PARAGRAPHS 6.0 AND 7.0 AS SPECIFIED IN THE TABLE 1. UNLESS SPECIFIED OTHERWISE, ASSEMBLIES SHALL BE MATED DURING EXPOSURE.

8.1 THERMAL SHOCK:

8.1.1 TEST STANDARD:	EIA 364-32, TEST CONDITION 1
8.1.2 NUMBER OF CYCLES:	10
8.1.3 TIME AT EACH TEMPERATURE:	30 MINUTES
8.1.4 TRANSFER TIME:	5 MINUTES MAXIMUM

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8.2 HUMIDITY, STEADY STATE:

- 8.2.1 TEST STANDARD: EIA 364-31, METHOD 3 CONDITION A
- 8.2.2 TEST HUMIDITY: 90% TO 98%.
- 8.2.3 TEST DURATION: 96 HOURS.

8.3 HIGH TEMPERATURE LIFE:

- 8.3.1 TEST STANDARD: EIA 364-17, TEST CONDITION 3, METHOD A
- 8.3.2 TEST TEMPERATURE: 85 °C
- 8.3.3 TEST DURATION: 250 HOURS

8.4 INDUSTRIAL MIXED FLOWING GAS (IMFG):

- 8.4.1 TEST STANDARD: EIA 364-65, CLASS:III
- 8.4.2 DURATION: 20 DAYS
- 8.4.3 CONDITION: MATED CONNECTORS

8.5 VIBRATION RANDOM:

- 8.5.1 TEST STANDARD: EIA 364-28, TEST CONDITION: V, TEST LETTER A
- 8.5.2 ACCEPTANCE CRITERIA: NO DISCONTINUITIES GREATER THAN 1 MICROSECOND
- 8.5.3 DURATION: 15 MINUTES ALONG EACH OF THREE ORTHOGONAL AXES
- 8.5.4 MOUNTING: SEE FIGURE 2

8.6 MECHANICAL SHOCK:

- 8.6.1 TEST STANDARD: EIA 364-27, CONDITION: H
- 8.6.2 DURATION: 18 SHOCK IMPULSES.
- 8.6.3 ACCEPTANCE CRITERIA: NO DISCONTINUITIES GREATER THAN 1 MICROSECONDS
- 8.6.4 MOUNTING: SEE FIGURE 2

8.7 DURABILITY:

- 8.7.1 TEST STANDARD: STANDARD LABORATORY PROCEDURE AS APPLICABLE TO THE SPECIFIC PRODUCT
- 8.7.2 NUMBER OF CYCLES: 1500 CYCLES
 12,000 CYCLES FOR 73725-XX3XXLF; 73725-XXSXXLF;
 74552-SXXXXXXLF; 74626-XXSXXLF; 87520-
 XSXXXXXXLF; 87583-SXXXXXXLF; 72309-SXXXXXXLF;
 10,000 CYCLES FOR 87583-3010XXLF

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8.7.3 CYCLING RATE: EIA 364-09

8.8 SOLDERABILITY:

8.8.1 TEST STANDARD: ANSI-J-002, TEST CONDITION A

8.8.2 ACCEPTANCE CRITERIA: MEETS ANSI-J-002 REQUIREMENTS

8.8.3 STEAM AGING: 1 HOURS

8.9 RESISTANCE TO SOLDER HEAT:

8.9.1 TEST STANDARD:

8.9.1.1 THRU HOLE EIA 364-56, PROCEDURE 3, CONDITION E

8.9.1.2 SURFACE MOUNT EIA 364-56, PROCEDURE 5, LEVEL 3

8.9.2 ACCEPTANCE CRITERIA: THERE SHALL BE NO EVIDENCE OF PHYSICAL OR MECHANICAL DAMAGE

8.10 RESISTANCE TO SOLVENTS:

8.10.1 TEST STANDARD: EIA 364-11, CLASS IV

8.10.2 ACCEPTANCE CRITERIA: NO EVIDENCE OF PHYSICAL OR MECHANICAL DAMAGE

8.10.3 SOLVENT TEMPERATURE: 25 °C

8.10.4 IMMERSION TIME: 3 MINUTES

~~8.11 SURFACE MOUNT CONNECTOR SOLDER JOINT RELIABILITY:~~

~~8.11.1 TEST STANDARD: BERG BUS 19-122~~

~~8.11.2 TEST CONDITION: 900 THERMAL CYCLES, CONTINUITY MONITOR ONLY.~~

9.0 QUALITY ASSURANCE PROVISIONS

9.1 EQUIPMENT CALIBRATION:

ALL TEST EQUIPMENT AND INSPECITON FACILITIES USED IN THE PERFORMANCE OF ANY TEST SHALL BE MAINTAINCED IN A CALIBRATION SYSTEM IN ACCORDANCE WITH MIL-C-45662 AND ISO 9000

9.2 INSPECTION CONDITIONS:

UNLESS OTHERWISE SPECIFIED HEREIN, ALL INSPECTIONS SHALL BE PERFORMED UNDER THE FOLLOWING AMBIENT CONDITIONS:

9.2.1 TEMPERATURE: 25 +/- 5 °C

9.2.2 RELATIVE HUMIDITY: 30% TO 60 %

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9.2.3 BAROMETRIC PRESSURE: LOCAL AMBIENT

9.3 SAMPLE QUANTITY AND DESCRIPTION

9.3.1 GROUPS 1,2,8: 8 SAMPLES IN EACH GROUP

9.3.2 GROUPS 3,5,6,7: 5 SAMPLES IN EACH GROUP

9.3.3 GROUP 4: 9 SAMPLES IN GROUP

9.4 ACCEPTANCE

9.4.1 ELECTRICAL AND MECHANICAL REQUIREMENTS PLACED ON TEST SAMPLES AS INDICATED IN PARAGRAPHS 6.0 AND 7.0 SHALL BE ESTABLISHED FROM TEST DATA USING APPROPRIATE STATISTICAL TECHNIQUES OR SHALL OTHERWISE BE CUSTOMER SPECIFIED, AND ALL SAMPLES TESTED IN ACCORDANCE WITH THIS PRODUCT SPECIFICATION SHALL MEET THE STATED REQUIREMENTS.

9.4.2 FAILURES ATTRIBUTED TO EQUIPMENT, TEST SET-UP, OR OPERATOR ERROR SHALL NOT DISQUALIFY THE PRODUCT. IF PRODUCT FAILURE OCCURES, CORRECTIVE ACTION SHALL BE TAKEN AND SAMPLES RESUBMITTED FOR QUALIFICATION.

9.5 QUALIFICATION TESTING: QUALIFICATION TESTING SHALL BE PERFORMED ON SAMPLE UNITS PRODUCED WITH EQUIPMENT AND PROCEDURES NORMALLY USED IN PRODUCTION. THE TEST SEQUENCE SHALL BE AS SHOWN IN TABLE 1

9.6 RE-QUALIFICATION TESTING: IF ANY OF THE FOLLOWING CONDITION OCCUR, THE RESPONSIBLE PRODUCT ENGINEER SHALL INITIATE RE-QUALIFICATION TESTING CONSISTING OF ALL APPLICABLE PARTS OF THE QUALIFICATION TEST MATRIX (TABLE 1):

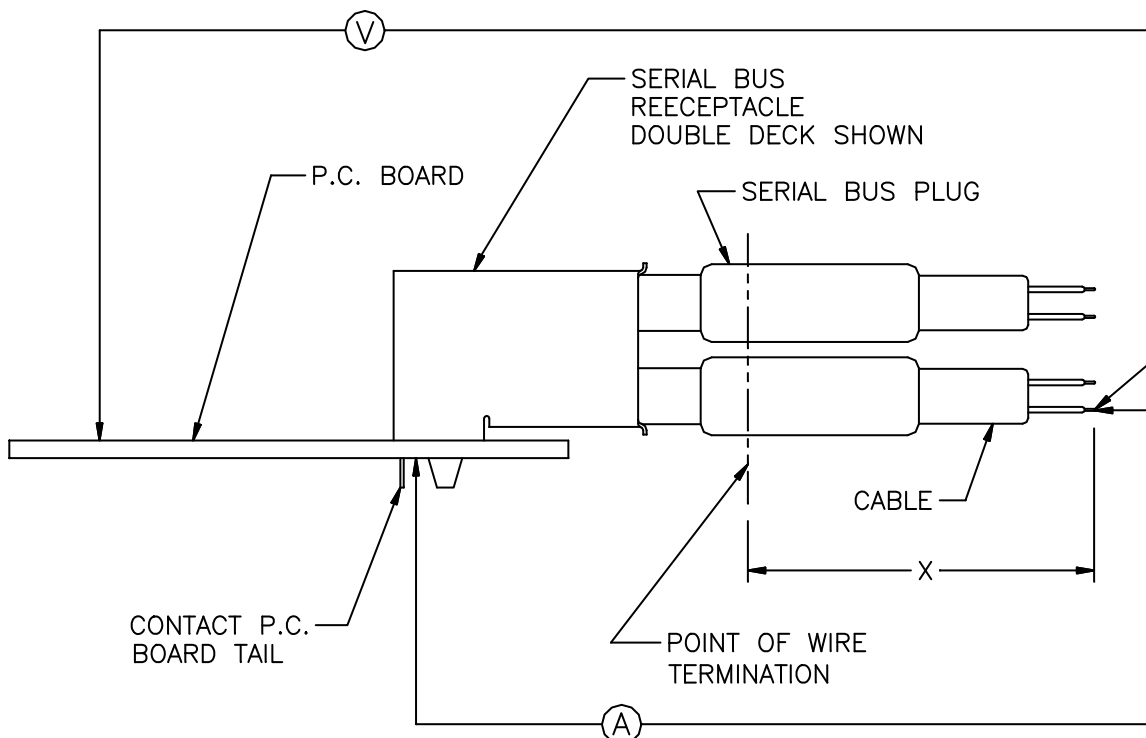
9.6.1 A SIGNIFICANT DESIGN CHANGE IS MADE TO THE EXISTING PRODUCT WHICH IMPACTS THE PRODUCT FORM, FIT OR FUNCTION. EXAMPLES OF SIGNIFICANT CHANGES SHALL INCLUDE, BUT NOT BE LIMITED TO, CHANGES IN THE PLATING MATERIAL COMPOSITION OR THICKNESS , CONTACT FORCE, CONTACT SURFACE GEOMETRY, INSULATOR DESIGN, CONTACT BASE MATERIAL, OR CONTACT LUBRICATION RQUIREMENTS.

9.6.2 A SIGNIFICANT CHANGE IS MADE TO THE MANUFACTURING PROCESS WHICH IMPACTS THE PRODUCT FORM, FIT OR FUNCTION.

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9.6.3 A SIGNIFICANT EVENT OCCURS DURING PRODUCTION OR END USE
 REQUIRING CORRECTIVE ACTION TO BE TAKEN RELATIVE TO THE
 PRODUCT DESIGN OR MANUFACTURING PROCESS.



1. RESISTANCE DUE TO X INCHES OF IS TO BE REMOVED FROM ALL READINGS

FIGURE 1

CONTACT RESISTANCE MEASUREMENT POINTS TYPICAL

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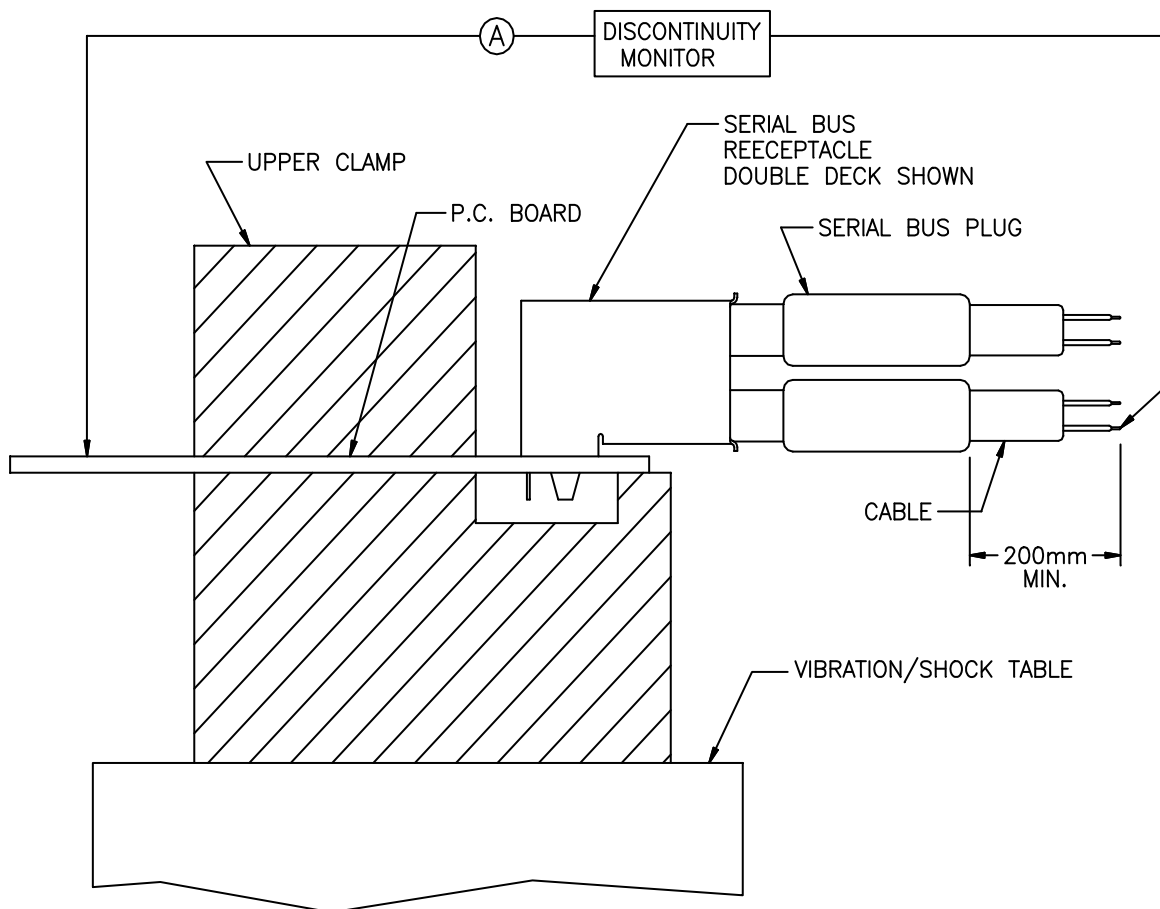


FIGURE 2
VIBRATION AND PHYSICAL SHOCK MOUNTING FIXTURE

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Test Groups And Sequence									
Test Procedure	Para	1	2	3	4	5	6	7	8
Product Examination	5.2	1,11	1,7	1,5,14	1,3	1,3	1,4	1,3	1,5
Contact Resistance	6.1	3,5,8,1	2,4,6	6,8,10					2,3
Insulation Resistance	6.2			3,13 (C)					
Dielectric Withstanding Voltage	6.3			4,12 (C)					
Current Rating	6.4				2				
Capacitance	6.5			2,11 (C)					
Mating/Unmating Forces	7.1	2,9							
Contact Retention	7.2		8(B)						
Thermal Shock	8.1			7					
Humidity, Steady State	8.2			9					
High Temperature Life	8.3		5						
Ind. Mixed Flowing Gas	8.4								4
Vibration	8.5	6							
Mechanical Shock	8.6	7							
Durability	8.7	4	3(A)						
Solderability	8.8					2			
Resistance to Soldering Heat	8.9						2		
Resistance to Solvents	8.10						3		
Surface Mount Solder Joint Reliability	8.11							2	
(A)Condition samples with 10 cycles of durability									
(B)Testing to be done on loose piece (unterminated) connector that has been exposed to high temperature life testing.									
(C)A single loose piece may be used for this testing									

Table 1
Qualification Testing and Sequence Matrix

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REV	PAGE	DESCRIPTION	EC#	DATE
A	ALL	RELEASED	T70149	4/18/'97
B	ALL	Add P/N 73725	T70375	8/28/'97
C	ALL	Add P/N 74612	J80259	6/08/'98
D	ALL	Add P/N 52319, 52469	J80259	6/08/'98
E	ALL	Add P/N 7422, 57423, 56434, 54006, 54026, 52369.	T10178	6/29/'01
F	5	5.4.1 Add "or 2,54um (100 μinches) minimum matted tin for lead free part"	N04-0084	11/08/04
	5	5.4.2 Add "or 2,54um (100 μinches) minimum matted tin for lead free part"	N04-0084	11/08/04
	5	Add 5.3.4 Insulator housings and covers of lead free part	N04-0084	11/08/04
	5	Add 5.4.3 lead free plating	N04-0084	11/08/04
	5	Add 5.3.5 lead free part material	N04-0084	11/08/04
G	7	5.5.5 Modify operation temperature to the range of -40~85 degree	N06-0260	10/12/06
H	7	5.5.5 Modify storage temperature to the range of -40~85 degree	N06-0284	11/13/06
	9	8.1 Modify thermal shock cycles to 10 times to meet USB 2.0 SPEC	N06-0284	11/13/06
	9	8.2 Modify humidity test standard to EIA 364-31, METHOD III CONDITION A to meet USB 2.0 SPEC	N06-0284	11/13/06
J	8, 9	Add new part numbers that can meet 12,000 and 10,000 mating cycles. Increase 2.1A at the amp section	N09-0203	09/20/2013
J1	6, 7, 10	1. Modify storing and operating temperature range from -40°C ~ 85°C to -55°C ~ 85°C; 2. modify 87520/87583/74552/74626 series current rating from 1.0 to 3A; AND 73725 series; current rating from 1.0 to 2.5A 3. modify steam aging from 4H to	/	9/11/2014

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		1H in solderability; 4. Delete "8.11 SURFACE MOUNT CONNECTOR SOLDER JOINT RELIABILITY" this section.		
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