## 1.0 OBJECTIVE

This specification defines the performance, test, quality and reliability requirements of the USB+Power (Universal Serial Bus with keyed power terminals) including the following: Series "A" Right Angle

## 2.0 SCOPE:

This specification is applicable to the termination characteristics of the USB+ Power family of products, which provides interconnection of computer peripherals.

## 3.0 GENERAL

This document is composed of the following sections:


| Paragraph | Title |
|---|---|
| 1. | OBJECTIVE |
| 2. | SCOPE |
| 3. | GENERAL |
| 4. | APPLICABLE DOCUMENTS |
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| Figure 1 | CONTACT RESISTANCE MEASUREMENT POINTS |
| Figure 2 | SHOCK AND VIBRATION MOUNTING FIXTURE |
| Table 1 | QUALIFICATION TESTING AND SEQUENCE MATRIX |


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## 4.0 APPLICABLE DOCUMENTS

4.1 Specifications:

4.1.1 Engineering Drawings

| | |
|---|---|
| 55917, 57489,10063583 | USB + Power Receptacle Assembly |
| 74233, 57496 | USB + Power Plug Assembly |

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 Insulation and Jacket for Telecommunication Wire and Cable, Test Standard Method |
| 4.4.7 | USB | Universal Serial BUS Specification |

4.5 Berg 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° 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 |
| 4.5.9 | BUS-19-040: | Plating Adhesion |
| 4.5.10 | BUS-19-002: | Surface Mount Solder Joint Reliability |
| 4.5.11 | BUS-19-122: | Solder Joint Reliability Test Procedure for Surface Mount Connectors |

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## 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 and Plug Terminal - The material shall be high strength copper alloy strip.

5.3.2 Receptacle and Plug Insulator Housings and Covers - Connectors shall be molded of plastic that is rated UL94-V-0 or better in accordance with UL-94.

5.3.3 Receptacle and Plug 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 vapor phase reflow oven. For 10063583, it also can withstand exposure to 260 °C peak temperature for 10 seconds for 3 times.

5.3.5 Lead free products – All lead free products are RoHS compatible.

### 5.4 Finish

5.4.1 Receptacle and Plug terminals - shall be plated in the contact area with 0,76um (30 µinches) palladium nickel with gold flash minimum over 1,27um (50 µinches) minimum nickel. The receptacle terminal solder tail sections shall be plated with 2,54um (100 µinches) 90/10 tin-lead minimum or 2,54um (100 µinches) minimum matted tin for lead free part over 1,27um (50 µinches) minimum nickel. The terminal areas outside of the contact areas and the solder tail areas shall be plated with 1,27um (50 µinches) nickel minimum.

5.4.2 Outside shells - shall be plated with 2, 00um (75µinches) minimum 90/10 bright tin-lead over 1,27um (50 µinches) minimum nickel underplate or 2, 00um (75µinches) minimum bright tin over 1,27um (50 µinches) minimum nickel underplate or only 1.27um (50 micro inches) minimum nickel.

5.4.3 Lead free plating - All plating chemical for lead free part are qualified by FCI. FCI qualification include solderability, whiskering, solder joint reliability and tarnishing effects.

### 5.5 Design and Construction

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5.5.1 Receptacle connector - is a multiple piece assembly having a lower single row of contacts (USB standard terminals) spaced on dissimilar centerlines (the two inner contacts are spaced 2.0mm apart and the terminals adjacent to these terminals are spaced 2.5mm away) in the interface area. The Upper row of contacts used for power transmission is spaced 2.5mm apart. Each terminal transition will be a 90 degree bend to allow for termination to the PC board by a through hole leg. The outside shell has six resilient contact arms (four on the sides and two on the bottom) that act as ESD grounding as well as cable plug retention features. The two 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 are mated. The receptacle is has a recess to accommodate the spring latch on the plug connector. The entire receptacle assembly is attached to the printed circuit board via four retention claws on the outside shell. The connector has four keys for various supply voltages. Refer to the Customer Drawing for recommended P.C. Board thickness and keying positions.

5.5.2 The plug connector - is a multiple piece assembly having a lower single row of contacts (USB standard terminals) spaced on dissimilar centerlines (the two inner contacts are spaced 2.0mm apart and the terminals adjacent to these terminals are spaced 2.5mm away) in the interface area. The Upper row of contacts used for power transmission is spaced 2.5mm apart. Each terminal is straight and is soldered to the cable connectors. The connector is fitted with two shells. The front shell when mated with the receptacle is in contact with the resilient contact arms of the receptacle providing EMI protection. The rear shell provides EMI protection as well as clamps to the cable providing a specified cable strain relief pull force. The outside shell has six resilient contact arms (four on the sides and two on the bottom) that act as ESD grounding as well as cable plug retention features. The two 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 are mated. A plastic spring latch on top of the connector positively latches into the receptacle connector when mated. The connector provides four keying positions for various supply voltages. Refer to the Customer Drawing keying positions.

5.5.3 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 an operating temperature range of -55°C to 85°C.

## 6.0 ELECTRICAL CHARACTERISTICS

6.1 Low Level Contact Resistance(LLCR)

| | | |
|---|---|---|
| 6.1.1 | Test Standard: | EIA 364-23 |
| 6.1.2 | Acceptance Criteria: | 30mΩ max. |
| 6.1.3 | Connection Method: | Attach current and voltage leads as shown in Figure 1 for p/n 55917, 74233/ Figure 3 for p/n 57489, 57496 |

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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 contacts and between contacts shell |

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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(> 1 mA) 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: | $30^0$ C Max. delta T any point. |
| 6.4.3 | Test Methods: | USB Section;<br>With all contacts energized 1.5 Amp per contact<br>Power Section;<br>With all contacts energized,3.0 Amps per contact.<br>Note: All contacts to be energized for this test |
| 6.4.4 | Ambient Conditions: | Still air at 25 degrees C. |

6.5 Capacitance

| | | |
|---|---|---|
| 6.5.1 | Test Standard: | EIA 364-30 |
| 6.5.2 | Acceptance Criteria: | 2 pF max. |
| 6.5.3 | Ambient Conditions: | Still air at 25 degrees 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: | <66.0 N (15 Lb.)per plug |
| | 7.1.2.2 | Unmating: | <44.0 N (10 Lb.)per plug after latch is unlatched |
| 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 |

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7.3 Latch Pull Force

| | | |
|---|---|---|
| 7.3.1 | Test Standard: | EIA 364-13 |
| 7.3.2 | Acceptance Criteria: | Mated condition Multi-directional <66.0 N (15 Lb.) without loss of continuity and without causing visible physical damage to the receptacle and plug |
| 7.3.3 | Application Rate: | 0.2 inches/minute |

7.4 Cable Pull Out

| | | |
|---|---|---|
| 7.4.1 | Test Standard: | EIA 364-46 |
| 7.4.2 | Acceptance Criteria: | Axial pull without loss of continuity, No jacket tears or visual exposure of shield. No jacket movement greater than 1.5 mm at point of exit |
| 7.4.3 | Application Rate: | Plug Unmated condition Cable Axial-directional <132.0 N (30 Lb.) 0.2 inches/minute |

7.5 Cable Flexing

| | | |
|---|---|---|
| 7.5.1 | Test Standard: | EIA 364-41, Condition I: dim x=3.7 x cable diameter or thickness; 100 cycles in each of two planes |
| 7.5.2 | Acceptance Criteria: | No discontinuities, DWV, IR, |
| 7.5.3 | Application Rate: | Mated Condition Cable |

## 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 I |
| 8.1.2 | Number of Cycles: | 5 |
| 8.1.3 | Time at each Temperature: | 30 minutes |
| 8.1.4 | Transfer Time: | 5 minutes maximum |

8.2 Temperature & Humidity

| | | |
|---|---|---|
| 8.2.1 | Test Standard: | As specified below |
| 8.2.2 | High Temperature/Humidity: | 60+/-3 degrees C @ 90-95 RH |
| | Low Temperature/Humidity | 25+/-3 degrees C @ 55 +/- 10% RH |
| 8.2.3 | Cycle times: | 8 hours total<br>1.75 hours @ Low, 1.5 ramp up, 4 hours @ high, .75 hour ramp down |

8.3 High Temperature Life

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| | | | |
|---|---|---|---|
| 8.3.1 | Test Standard: | EIA 364-17, Test Condition 3, Method A |
| 8.3.2 | Test Temperature: | 85 degrees 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: | 7 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 for p/n 55917, 74233/ Figure 4 for p/n 57489, 57496 |

8.6 Mechanical Shock

| | | |
|---|---|---|
| 8.6.1 | Test Standard: | EIA 364-27, Condition: H |
| 8.6.2 | Acceptance Criteria: | No discontinuities greater than 1microseconds |
| 8.6.3 | Mounting: | See Figure 2 |

8.7 Durability

| | | |
|---|---|---|
| 8.7.1 | Test Standard: | Standard laboratory procedure as applicable to the specific product, Latch removed |
| 8.7.2 | Number of Cycles: | 1500 cycles |
| 8.7.3 | Cycling Rate: | 200 cycles/hour Maximum |

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: | 4 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 |

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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 |

## 9.0 QUALITY ASSURANCE PROVISIONS

9.1 Equipment Calibration

All test equipment and inspection facilities used in the performance of any test shall be maintained 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 degrees C |
| 9.2.2 | Relative Humidity: | 30% to 60% |
| 9.2.3 | Barometric Pressure: | Local ambient |

9.3 Sample Quantity and Description
Total Receptacles: 52
Total Plugs 57

| | | |
|---|---|---|
| 9.3.1 | Groups 1, 2 ,7: | 8 samples in each group ( 8 receptacles, 8 plugs) |
| 9.3.2 | Groups 3, 5, 6: | 5 samples in each group (5 receptacles, 5 plugs) |
| 9.3.3 | Group 4: | 3 samples in group ( 3 receptacles, 3 plugs) |
| 9.3.4 | Group 8, 9: | 5 samples in group ( 5 receptacles, 5 plugs) |
| 9.3.5 | Group 10: | 5 samples in group ( 5 plugs) |

Note: Group 3: Receptacle is loose piece and not mounted to the test board

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 occurs, 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.

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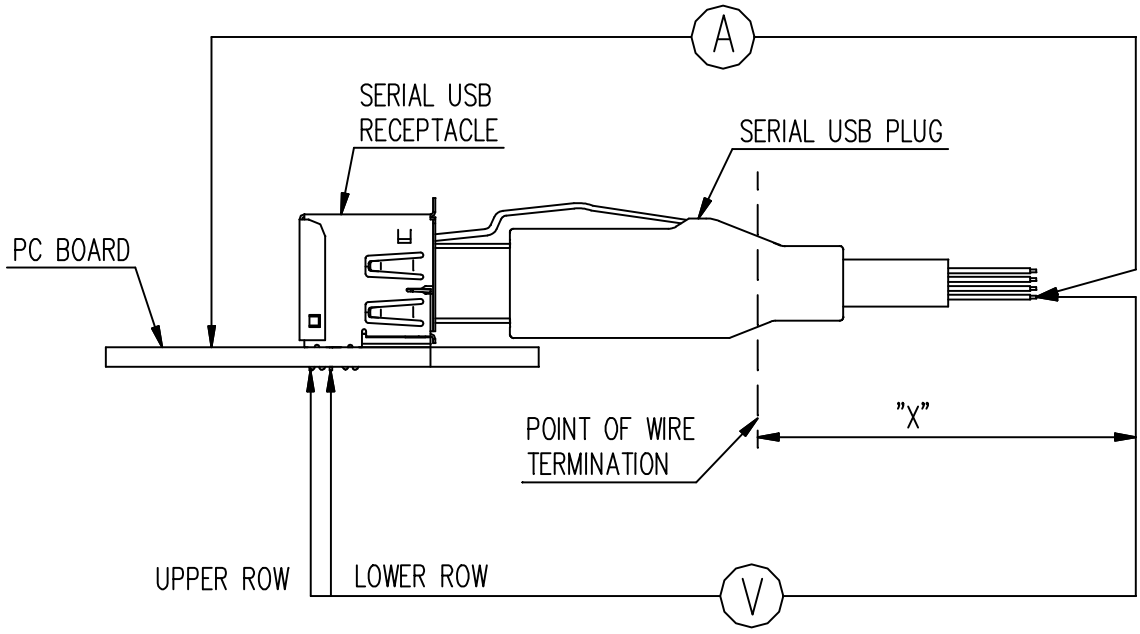
9.6 Re-qualification Testing - If any of the following conditions occur, the responsible product engineer shall initiate re-qualification testing consisting of all applicable parts of the qualification test matrix (Table 1).

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 requirements.

9.6.2 A significant change is made to the manufacturing process which impacts the product form, fit or function.

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.

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NOTE: SUBTRACT BULK WIRE RESISTANCE OF LENGTH "X" FROM MEASUREMENTS

FIGURE 1
CONTACT RESISTANCE MEASURMENT POINTS

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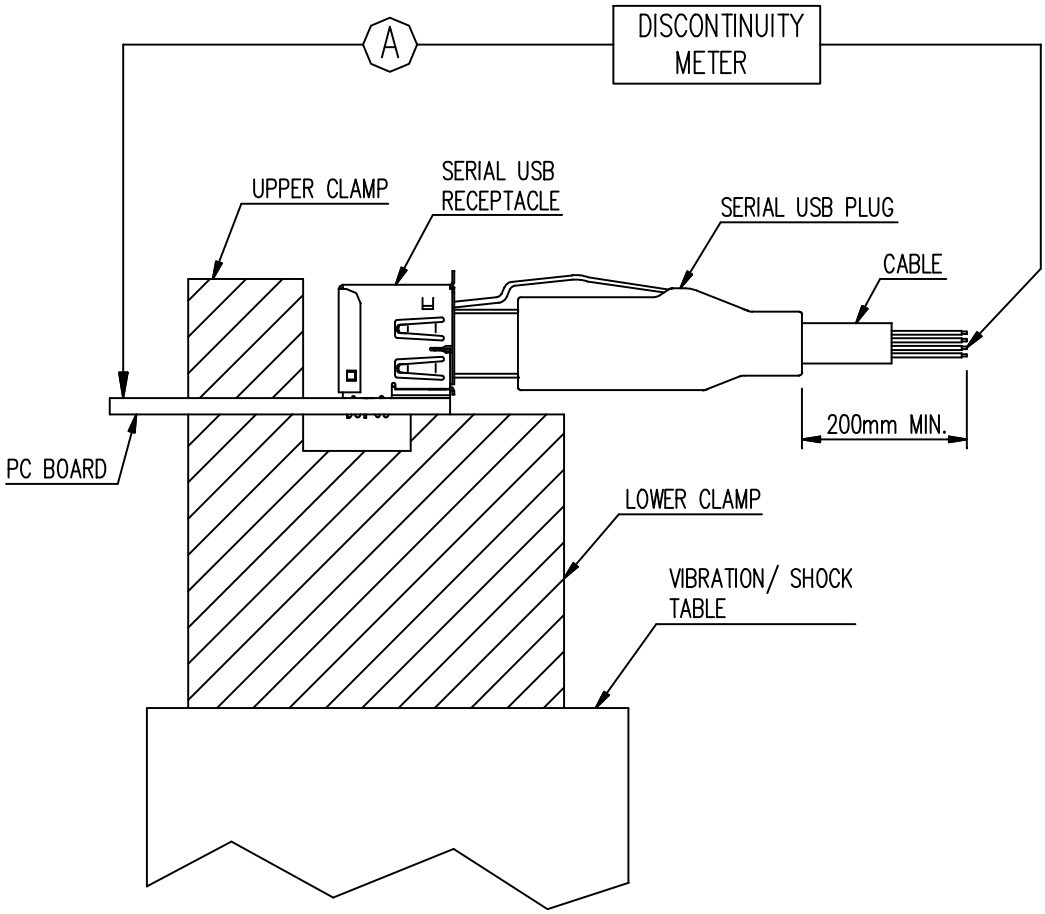
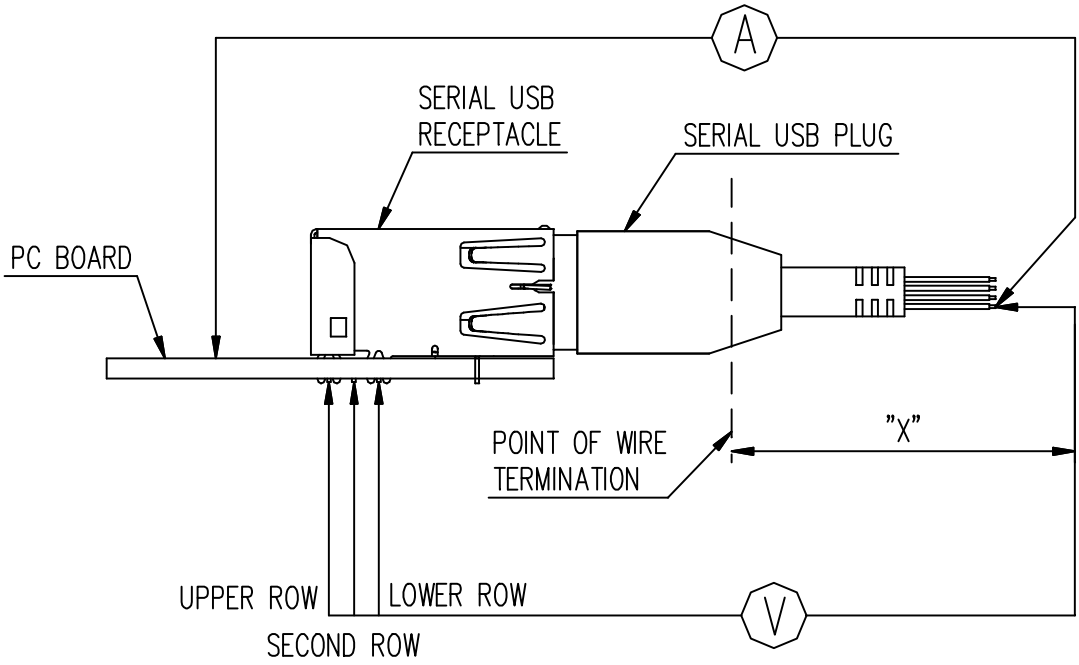



FIGURE 2
SHOCK AND VIBRATION MOUNTING FIXTURE

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NOTE: SUBTRACT BULK WIRE RESISTANCE OF LENGTH "X" FROM MEASUREMENTS

FIGURE 3
CONTACT RESISTANCE MEASURMENT POINTS

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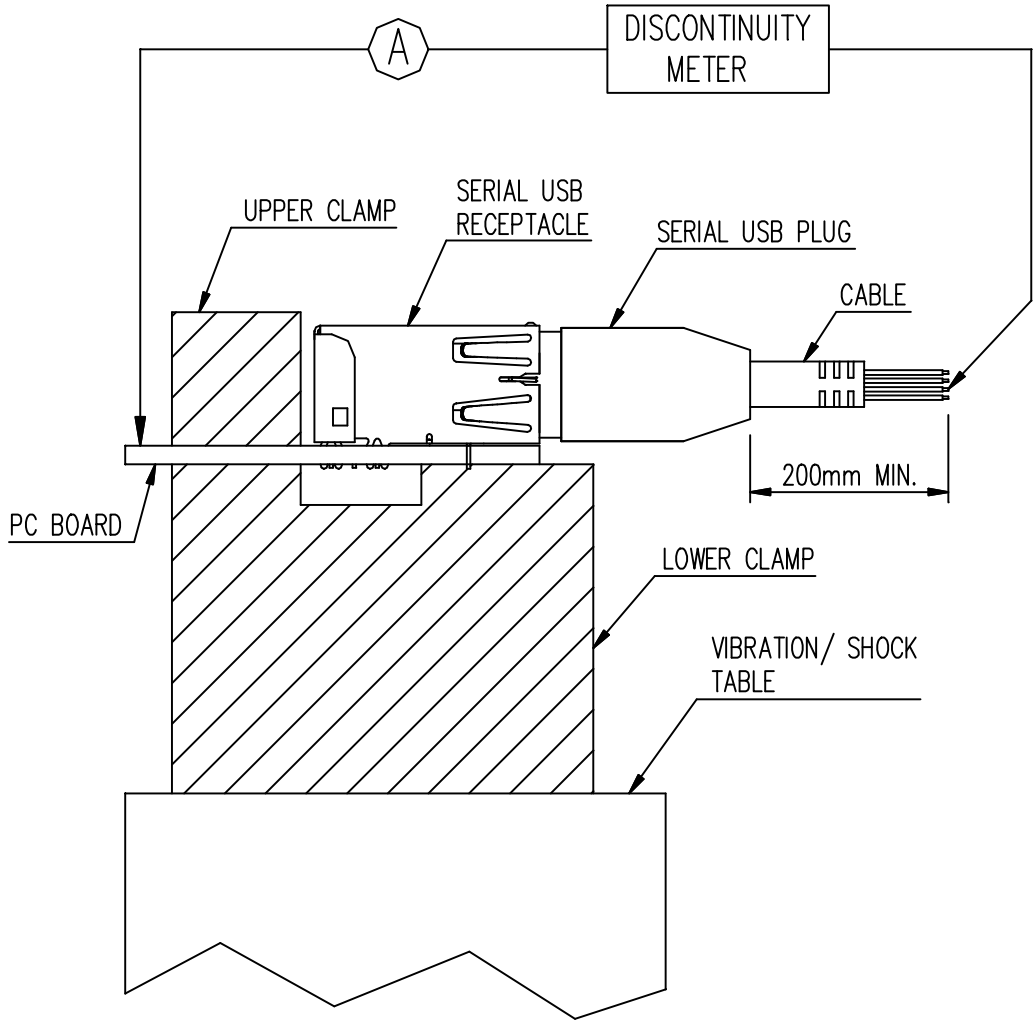



FIGURE 4
SHOCK AND VIBRATION MOUNTING FIXTURE

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## Qualification Testing and Sequence Matrix

See paragraph. 9.3 for quantities

| Test Procedure | Para | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Examination | 5.2 | 1,11 | 1,7 | 1,5,11 (C) | 1,3 | 1,3 | 1,4 | 1,5 | 1,3 | 1,5 | 1,3 |
| Contact Resistance | 6.1 | 3,5,8, 10 | 2,4,6 | | | | | 2,6 | | | |
| Insulation Resistance | 6.2 | | | 3,10 (C) | | | | | | 2,6 | |
| Dielectric Withstanding Voltage | 6.3 | | | 4,9 (C) | | | | | | 3,7 | |
| Current Rating | 6.4 | | | | 2 | | | | | | |
| Capacitance | 6.5 | | | 2,8 (C) | | | | | | | |
| Mating / Unmating Forces | 7.1 | 2,9 | | | | | | | | | |
| Contact Retention | 7.2 | | 8 (B) | | | | | | | | |
| Thermal Shock | 8.1 | | | 6 | | | | 3 (D) | | | |
| Temperature and Humidity | 8.2 | | | 7 | | | | 5(E) | | | |
| 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 | | | | |
| Latch Test | 7.3 | | | | | | | | 2 | | |
| Cable Flex Test | 7.4 | | | | | | | | | 4 | |
| Cable Pull Out | 7.5 | | | | | | | | | | 2 |
| ( A ) Condition samples with 10 cycles of durability | | | | | | | | | | | |
| ( B ) Testing to be done on loose piece (un-terminated) connector that has been exposed to high temperature life testing | | | | | | | | | | | |
| ( C ) Loose piece parts used for this testing | | | | | | | | | | | |
| ( D ) Condition samples with 5 cycles of durability | | | | | | | | | | | |
| ( E ) Test durability 7 days only | | | | | | | | | | | |

**Table 1**
**Qualification Testing and**
**Sequence Matrix**

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## REVISION RECORD

| REV | PAGE | DESCRIPTION | EC # | DATE |
|---|---|---|---|---|
| A | All | Released | V81785 | 9/29/98 |
| B | All | Removed group 7 from matrix<br>Renamed groups 8,9,10,11 to 7,8,9,10,<br>Decreased quantity of group 4 from 9 to 3<br>Paragraph 9.3 Quantities were Total Receptacles 63, Total plugs 68 | V82003 | 11/04/98 |
| C | ALL | Para. 7.1 Changed from >44.0 N to < 44.0 N<br>Para 7.1.2 Added without causing visible physical damage to the receptacle. | V01739 | 08/03/00 |
| D | ALL | Para 7.3.2 Added without causing visible physical damage to the plug and receptacle. | V01775 | 08/28/00 |
| E | ALL | Guardian Site Transfer To Taiwan. | T20205 | 08/14/02 |
| F | ALL | Add Figure 3&4 to describe electrical test | T20276 | 09/10/02 |
| G | ALL | Update current rating | T04-0101 | 03/05/04 |
| H | 3 | 5.4.1 Add “or 2,54um (100 µinches) minimum matted tin for lead free part” | N04-0072 | 10/21/04 |
| | 3 | 5.4.2 Add “or 2,00um (75 µinches) minimum matted tin for lead free part” | N04-0072 | 10/21/04 |
| | 3 | Add 5.3.4 Insulator housings and covers of lead free part | N04-0072 | 10/21/04 |
| | 3 | Add 5.4.3 lead free plating | N04-0072 | 10/21/04 |
| | 3 | Add 5.3.5 lead free part material | N04-0072 | 10/21/04 |
| J | 2 | 4.1.1 Add engineering drawing 10063583 | N06-0234 | 09/05/06 |
| | 3 | 5.4.2 Add plating option: only nickel | N06-0234 | 09/05/06 |
| H | 4 | 5.5.5 Change the storage temperature range from -40oC~~60oC to -55oC~~85oC.And change the operating temperature range from 0oC~~40oC to -55oC~~85oC. | N10-0120 | 07/05/10 |

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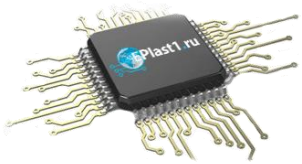
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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