# PRODUCT SPECIFICATION

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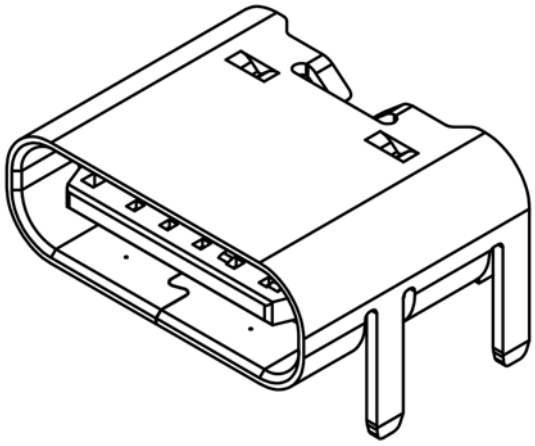
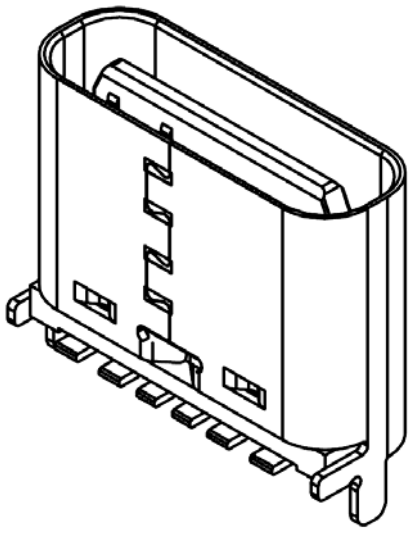
|---|---|---|---|---|---|---|---|
| **Part Number** | USB4125&USB4130 | | | **Rev** | A1 | **Date** | 26/05/21 |
| **Product Description** | USB Type C Receptacle, 6 contacts, For Power Charging only | | | | | **Page** | 1 |
| **Doc Number** | USB Type C | **Prepared** | CC | **Checked** | VJ | **Approved** | PH |



**USB4125**



**USB4130**

# PRODUCT SPECIFICATION

| | | | | | | | |
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## 1.0 SCOPE.

This specification covers performance, tests and quality requirements for the USB Type C Receptacle, 6contacts range.USB4125, USB4130.

## 2.0 PRODUCT NAME AND PART NUMBER.

USB Type C Receptacle 6contacts range. USB4125&USB4130.

## 3.0 PRODUCT SHAPE, DIMENSIONS AND MATERIAL.

Please refer to drawings.

## 4.0 RATINGS.

4.1 Current rating: 3.00A collectively for VBUS pins(pins A9, B9)

4.25A collectively for GND pins(pins A12, B12)

1.25A for VCONN (pin B5)

0.25A for pin A5

4.2 Voltage rating …… 20V DC

4.3 Operating Temperature Range …… -30°C to +85°C

## 5.0 TEST AND MEASUREMENT CONDITIONS.

Product is designed to meet electrical, mechanical and environmental performance requirements specified below. All tests are performed in ambient conditions unless otherwise specified.

## 6.0 PERFORMANCE.

| Test No | Item | Test Condition | Requirement |
|---|---|---|---|
| 6.0.1 | Examination of Product | Visual, dimensional and functional inspection as per quality plan. | Product shall meet requirements of product drawing and specification. |
| | Reseating | Manually plug/unplug 3 times | No physical damage |

6.1 Electrical Performance.

| Test No | Item | Test Condition | Requirement |
|---|---|---|---|
| 6.1.1 | Low Level Contact Resistance | The low level contact resistance measurement is made from the solder tail of the receptacle to the soldering point of the plug. When measured at 20mV Max. open circuit at 100mA. Mated test contacts must be in a connector housing. In accordance with EIA-364-23, Test Condition B | 40mΩ max (initial) |
| 6.1.2 | Insulation Resistance | Both unmated and Mated connectors, apply 100V DC for 1 minute at sea level between adjacent terminal or ground. In accordance with EIA-364-21. | 100 MΩ Min (initial). |
| 6.1.3 | Dielectric Strength | Mate connectors, apply 100V AC (RMS) for 1 minute at sea level. In accordance with EIA-364-20. | No Breakdown. |
| 6.1.4 | Contact current rating | A current of 3 A shall be applied collectively to VBUS pins (i.e., pins A9, B9) and 1.25 A shall be applied to the VCONN pin (i.e., B5) as applicable, terminated through the corresponding GND pins (i.e., pins A12, B12). A minimum current of 0.25 A shall also be applied individually to pin A5, as applicable. | The temperature rise shall not exceed 30°C at the outside surface of the shell. |

6.2 Mechanical Performance.

| Test No | Item | Test Condition | Requirement |
|---|---|---|---|
| 6.2.1 | Mating/Un-mating Force | Mate/Un-mated at a speed of 12.5mm/min. In accordance with EIA-364-13. | Mating force: within 5N to 20N (initial). Un-Mating force: within 8N to 20N up to 30cycles, within 6N to 20N after 10,000cycles |
| 6.2.2 | Durability | USB4125: 20,000 cycles<br>USB4130: 10,000 cycles<br>Test at a<br>cycle rate 500± 50 per hour.<br>In accordance with EIA-364-09. | Un-Mating force: within 6N to 20N<br>Contact resistance: 50mΩ max<br>Dielectric Strength: no breakdown |
| | Durability (Preconditioning) | 50 cycles at a<br>cycle rate 500± 50 per hour<br>In accordance with EIA-364-09. | - |
| 6.2.3 | Vibration | EIA 364-28 Test Condition VII, Test Letter D<br>15 minutes in each of 3 mutually perpendicular directions. Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against another. The method of fixturing should be detailed in the test report | No evidence of physical damage and no discontinuity longer than 1 microsecond.<br>Contact resistance: 50mΩ max. |
| 6.2.4 | 4-Axis Continuity | Shall be tested for continuity under stress using a test fixture | No evidence of physical damage and no discontinuity longer than 1 microsecond. |

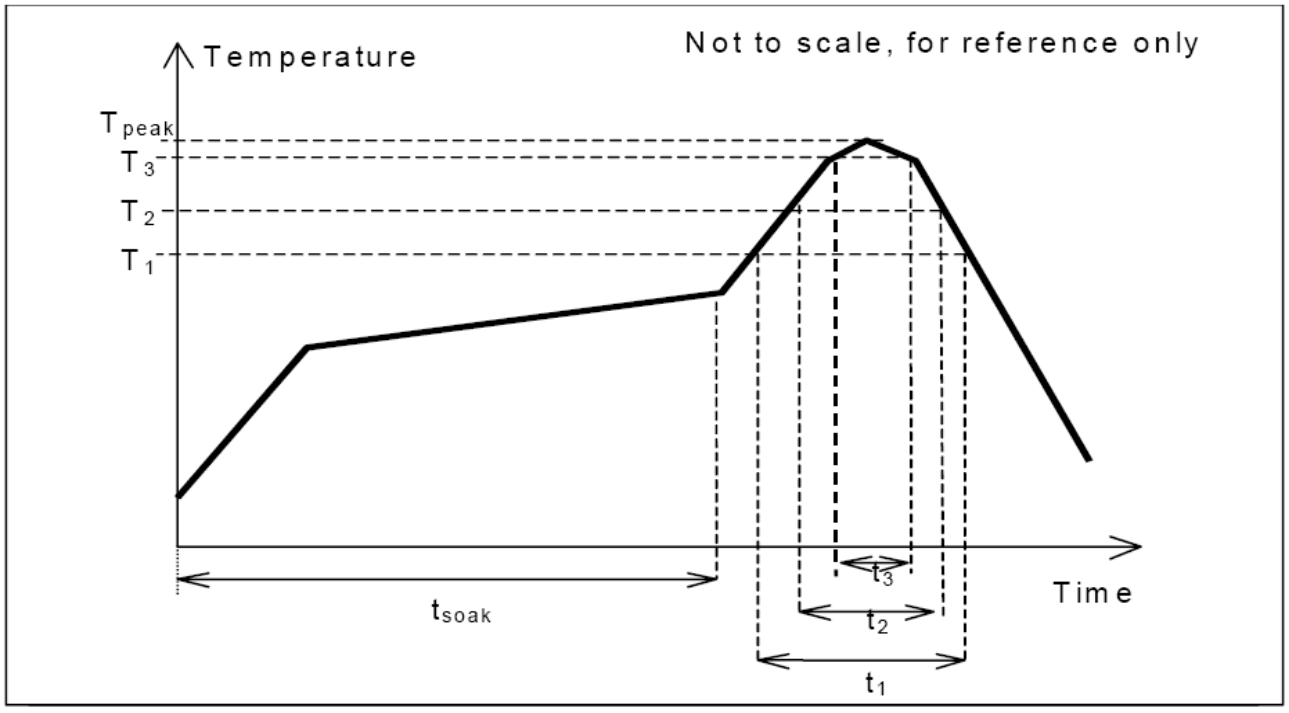
## 6.3 Environmental Performance and Others.

| Test No | Item | Test Condition | Requirement |
|---|---|---|---|
| 6.3.1 | Cyclic Temperature and Humidity Test | Cycle the connector between 25 °C ±3 °C at 80 % ±3% RH and 65 °C ±3 °C at 50 % ±3% RH. Ramp times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles. | Contact Resistance: 50mΩ Max. |
| 6.3.2 | Salt Spray | Subject mated connectors to 5±1% salt-solution concentration, 35±2°C for 24 hours. In accordance with EIA-364-26, Test Condition B. | Shall meet visual requirements, No detrimental corrosion allowed in contact area and base metal exposed. |
| 6.3.3 | Thermal Shock | Temperature range from -55°C~+85°C .Start from -55°C. After 30 min. change to +85°C, change time is no more than 5min. Total 10 cycles.<br>Test reference standard: EIA 364-32, test condition I | No physical damage. Contact Resistance (Low Level) 50m max. |
| 6.3.4 | Solderability | Solder pot temperature: 250±5°C for 3~5 seconds. In accordance with EIA-364-52. | 95% of immersed area must show no voids, pin holes. |
| 6.3.5 | Temperature life | 105º C without applied voltage for 120 hours. EIA-364-17, method A | Contact resistance : 50mΩ max |
| | Temperature Life (preconditioning) | 105º C without applied voltage for 72 hours. EIA-364-17, method A | - |
| 6.3.6 | Mixed flowing gas | EIA 364-65,Class II A<br>Samples should be placed in an environmentally controlled 'test chamber' that is monitored by a gas analyzing system for controlled concentrations of the specified gas mixture. Test coupons shall also be used and the weight gain reported.<br>Test duration is 7 days. | Contact resistance : 50mΩ max |
| 6.3.7 | Thermal disturbance | Cycle the connector or socket between 15 °C ±3 °C and 85 °C ± 3 °C, as measured on the part. Ramps should be a minimum of 2 °C per minute, and dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles. | Contact resistance : 50mΩ max |

## 7.0 RESISTANCE TO INFRARED REFLOW SOLDERING HEAT

| Parameter | Reference | Specification |
|---|---|---|
| Average temperature gradient in preheating | | 2.5°C/s |
| Soak time | $T_{soak}$ | 2-3 minutes |
| Time above 217°C | $T_1$ | 60 |
| Time above 230°C | $T_2$ | 50 |
| Time above 250°C | $T_3$ | 5 |
| Peak temperature in reflow | $T_{peak}$ | 255°C(–0/+5°C) |
| Temperature gradient in cooling | | -5°C/s max |

Lead Free Process




This profile is the minimum requirement for evaluating soldering heat resistance of components. Heat transfer method used for reflow soldering is hot air convection. The actual air temperatures used to achieve the specified profile is higher and largely dependent on the reflow equipment.

## 8.0 PRODUCT QUALIFICATION AND TEST SEQUENCE

Note: each group test needs 5pcs samples.

| Test No | Description | Requirement |
|---|---|---|
| **Group A-1** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.1 | LLCR | 40mΩ Max all contacts |
| 6.2.2 | Durability (preconditioning) | 50 cycles; No physical damage |
| 6.3.5 | Temperature Life | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Reseating | No physical damage |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group A-2** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.1 | LLCR | 40mΩ Max all contacts |
| 6.2.2 | Durability (preconditioning) | 50 cycles; No physical damage |
| 6.3.3 | Thermal Shock | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.3.1 | Humidity | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Reseating | No physical damage |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group A-3** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.1 | LLCR | 40mΩ Max all contacts |

| | | |
|---|---|---|
| 6.2.2 | Durability (preconditioning) | 50 cycles; No physical damage |
| 6.3.5 | Temperature Life (preconditioning) | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.2.3 | Vibration | Discontinuity less than 1μs |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group A-4** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.1 | LLCR | 40mΩ Max all contacts |
| 6.2.2 | Durability (preconditioning) | 50 cycles; No physical damage |
| 6.3.5 | Temperature Life (preconditioning) | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.3.6 | Mixed Flowing Gases | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.3.7 | Thermal Disturbance | |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Reseating | No physical damage |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group A-7** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.3 | DWV | No breakdown or flashover |
| 6.1.1 | LLCR | 40mΩ Max all contacts |
| 6.2.2 | Durability (preconditioning) | No physical damage |
| 6.2.1 | Insertion Force | Within the range of 5N to 20N. |
| 6.2.1 | Extraction force | Within the range of 8N to 20N. Initial Reading |
| 6.2.2 | Durability | 25cycles, No physical damage |

| | | |
|---|---|---|
| 6.2.1 | Extraction force | Within: a) 33% of initial reading & b) 8N to 20N |
| 6.2.2 | Durability | Perform 2468cycles and then rotate the plug or socket 180° and then perform 2500cycles. rotate the plug or socket 180° and then perform 2500cycles. rotate the plug or socket 180° and then perform 2500cycles. No physical damage |
| 6.2.1 | Extraction force | Within the range of 6N to 20N. |
| 6.1.1 | LLCR | 50mΩ Max all contacts |
| 6.1.3 | DWV | No breakdown or flashover |
| 6.1.2 | Insulation Resistance | 100 MΩ Max. |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group B-1** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.2.4 | 4-Axis Continuity | Discontinuity less than 1μs |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| | | |
| **Group B-6** | | |
| 6.0.1 | Examination | Visual inspection; No physical damage |
| 6.1.5 | Contact Current Rating | The Temperature Rise shall not exceed 30°C |
| 6.0.1 | Examination | Visual inspection; No physical damage |

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Revision details :-

| Revision | Information | Page | Release Date |
|---|---|---|---|
| A | Specification released. | - | 25/11/20 |
| A1 | Change USB4125 durability from 10000 cycles to 20000 cycles | 3 | 26/05/21 |
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