



PRODUCT SPECIFICATION

TITLE

1.0 SCOPE

This Product Specification covers the requirement of USB type C receptacle.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER

Product name: USB type C receptacle
Part number: 2024100002

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See sales drawing: 2024100002

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the sales drawings take precedence.

4.0 RATINGS

4.1 VOLTAGE

30 Volts AC.

4.2 CURRENT

6.0 A total for VBUS and GND PIN

4.3 TEMPERATURE

Operating: - 40°C to + 85°C
Storage: - 40°C to + 85°C

5.2 MECHANICAL REQUIREMENTS

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5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.1.1	Visual inspection	Refer to EIA 364-18B	Visual inspection samples shall be free from defect such as damage, deformation, blister and burrs that are detrimental to the function and appearance.
5.1.2	LLCR	Refer to EIA-364-23C 100 mA at 20 mV open circuit	Initial 40 mΩ Max, Δ10mΩ after environment and mechanical test
5.1.3	Insulation Resistance	Refer to EIA-364-21D Apply 500 VDC between conductors for 2 minutes , which should not make contact under normal condition 1000 MΩ Min.	Initial 1000 MΩ Min. 100 MΩ after environment test
5.1.4	Dielectric with Standing Voltage	Refer to EIA-364-20D Method A 500V AC 60Hz for 1 min Include contact to contact and contact to shell	No breakdown Leakage current<0.5mA
5.1.5	Contact Capacitance	Refer to EIA-364-30, Frequency 1 kHz 1%	2pF Max between each two contact
5.1.6	Temperature Rise	Refer to EIA-364-70B, Method 1. Measured at maximum rated current with series all contacts or shell; 1> 4 pairs VBUS and GND parallel connection, 1.5 A /Pair, SBU1/SBU2 1.0A/PIN, all the others 0.25A/Pin 2> 1 pair VBUS and GND, 3A /Pair all the others pin 0.25A/Pin	After tests maximum increase for environmental temperature, 30 °C Max

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.2.1	Mating Force	Refer to EIA-364-13E Method A (Mate with cable) The connectors shall be fully mated or coupled at a rate of 12.5 millimeters / minute; the peak force required for mating shall be recorded.	Mating force>=5N, <=20N before and after 10000 cycles durability

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5.2.2	Un-mating Force	Refer to EIA-364-13E MethZZSod A (Mate with cable) The connectors shall be fully mated or coupled at a rate of 12.5 millimeters / minute; the peak force required for mating shall be recorded.	Un-mating force $\geq 8N$, $\leq 20N$ before and after 1000 cycles durability, Un-mating force $\geq 6N$, $\leq 20N$ before and after 10000 cycles durability
5.2.3	Durability	Refer to EIA-364-09C (Mate with cable) Automatic equipment: 500 ± 50 times/hour, each side 5000 cycles total 10000 cycles,	No mechanical damage, contact resistance, Connector Mating/un-mating in spec
5.2.4	Mechanical shock	50G'S HALF SINE 11 ms duration three shocks each axis	Discontinuity max $1 \mu s$ all contacts in series
5.2.5	Radom Vibration	Refer to EIA-364-28F ,condition v test letter A (Mate with cable) 5.35Gs RMS 15 MINUTES each axis	Discontinuity max $1 \mu s$ all contacts in series
5.2.6	Sine Vibration	Refer to EIA-364-28F ,condition I (Mate with cable) Amplitude 1.52 mm (0.06 in), 10 Hz to 55 Hz in 1 minute, 2 hours in each of three mutually perpendicular directions (Total of 6 hours) under electrical load conditions.	Discontinuity max $1 \mu s$ all contacts in series

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTI ON	TEST CONDITION	REQUIREMENT
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5.3.1	Salt Spray	Comply with EIA-364-26B Test condition B At temp. $35^{\circ} \pm 2^{\circ} \text{C}$ R/H 95-98% Salt NaCl mist 5%, 48 hours continuous spray for FG, no brush cleaning, water cleaning is allowed, 35 degree baking within no more than 16hours	No visual damage and meet LLCR and insulation resistance Inspection area (50X) : 1>Contact area with gold-plating on the whole mating area: 2>Shell and shield-plate with Ni plating Judgment for corrosion: 3>Diameter of corrosion point < 0.05mm exclude 4>Corrosion point (diameter > 0.05mm) of each contact no more than 1, 5>Contact numbers with one corrosion point < 8% total pin
5.3.2	Humidity-Temperature Cycling	Refer to EIA-364-31C Method IV, Test condition B. 25°C - 65°C , 95% RH 10 cycle (240Hr)	No mechanical damage No change to performance Contact resistance: $\Delta R = 10\text{m}\Omega$ Max. Insulation resistance > 1000M Ω
5.3.3	High-temperature and humidity	Refer to EIA-364-31C High-temperature 85°C , 95%RH Duration : 120h	No mechanical damage No change to performance Contact resistance: $\Delta R = 10\text{m}\Omega$ Max. Insulation resistance > 1000M Ω
5.3.4	Thermal shock	Refer to EIA-364-32F method A, test condition I, test duration A-1 25 cycle at $T_a = -55^{\circ}\text{C}$ ($\pm 5^{\circ}\text{C}$) for 0.5 hours; then change of temp = 25°C ($\pm 10^{\circ}\text{C}$) Maximum 5 min; then $T_b = +85^{\circ}\text{C}$ ($\pm 3^{\circ}\text{C}$) for 0.5 hours; then cool to ambient. Recovery: 2 hours at ambient atmosphere.	No mechanical damage No change to performance Contact resistance: $\Delta R = 10\text{m}\Omega$ Max. Insulation resistance > 1000M Ω
5.3.5	Temperature life	Refer to EIA-364-17, Method B, test condition 4, 96h with electrical load for connectors Chamber temperature is $105 \pm 2^{\circ}\text{C}$ (temperature rise + chamber temperature = specified test temperature)	No mechanical damage No change to performance Contact resistance: $\Delta R = 10\text{m}\Omega$ Max. Insulation resistance > 1000M Ω
5.3.6	Low Temperature	Refer to EIA-364-59A test condition 3, duration D Temperature $-40 \pm 3^{\circ}\text{C}$ 96h	No mechanical damage No change to performance Contact resistance: $\Delta R = 10\text{m}\Omega$ Max. Insulation resistance > 100M Ω

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5.3.7	Thermal disturbance	Comply with EIA-364-32F, Cycle the connector between $15^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 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.	No visual damage
5.3.8	Thermal Cycling	Comply with EIA-364-32F Cycle the connector between $15^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 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 500 such circles	No visual damage and meet LLCR and insulation resistance

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5.4 SI REQUIREMENT USB 3.0

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.4.1	Differential Impedance	The differential impedance of a mated connector should be within $90 \Omega \pm 15 \Omega$ as seen from 50 ps(20%~80%) rise time.	Maximum: 105 Ω Minimum: 75 Ω
5.4.2	Differential Insertion Loss (DDIL)	The differential insertion loss measures the differential signal energy transmitted through the mated cable assembly	SS pairs ≥ -1.5 dB for 100MHz; ≥ -5 dB for 1.25GHz; ≥ -7.5 dB for 2.5GHz; ≥ -25 dB for 7.5GHz; DD (D+/D-) -0.67 dB Maximum @ 12 MHz -0.95 dB Maximum @ 24 MHz -1.35 dB Maximum @ 48 MHz -1.90 dB Maximum @ 96 MHz -3.20 dB Maximum @ 200 MHz -5.80 dB Maximum @ 400MHz
5.4.3	Differential Near End & Far End Crosstalk Between Super Speed Pairs	The differential crosstalk measures the unwanted coupling between differential pairs. Only the differential near-end crosstalk (DDNEXT) is specified. The DDNEXT shall be measured in time domain with a rise time of 50 ps (20-80%) entering the connector under test.	≤ -27 dB for 100MHz; ≤ -27 dB for 2.5GHz; ≤ -23 dB for 3GHz; ≤ -23 dB for 7.5GHz; The Peak-to-Peak value shall be less than 1.2% of input voltage swing
5.4.4	Differential Near End & Far End Crosstalk Between D+/D- and Super Speed Pairs	The differential near end and far end crosstalk between the D+/D- pairs and Super Speed pairs in mated cable assembly. The near end & far end crosstalk shall be measured in time domain with a rise time of 50 ps (10-90%) entering the connector under test.	≤ -21 dB for 100MHz; ≤ -21 dB for 2.5GHz; ≤ -15 dB for 3GHz; ≤ -15 dB for 7.5GHz; The Peak-to-Peak value shall be less than 2% of input voltage swing
5.4.5	Differential to Common Mode	Common mode noise is related to EMC performance	≤ -20 dB for 100MHz; ≤ -20 dB for 6GHz; ≤ -20 dB for 7.5GHz;

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5.5 SOLDER-ABILITY REQUIREMENT

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.5.1	Surface Mount Solder-ability Test	Refer to IPC-J-STD-002C.	At least 95% of immersed area should be adequately wetted on all samples except on cutting edge of terminal.
5.5.2	Solder peel off strength	Push 40 N in 10 seconds. Push on all direction on 6 samples Final peel off force should be noted for each direction.	No mechanical damage to component. Electrical performance still within requirements.

5.6 IPX8 WATER PROOF

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.6.1	IPX8 water proof	Refer to IEC/EN 60529 IPX8 requirement, 1.5m/30 minutes, reflow twice before test	No water leakage

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6.0 TEST GROUP

Test Item	Description	A	B	C	D	E	F	G	H	I	J	K	L	M	N
5.1.1	Visual inspection	1,3	1,10	1,15	1,10	1,8	1,7	1,7	1,3	1,6	1,6	1,8	1,3	1,3	
5.1.2	LLCR		2,6,9	3,12	2,4,9	2,4,7	2,6	2,6		2,5	2,5	2,4,7			
5.1.3	Insulation resistance			14											
5.1.4	Dielectric withstanding voltage			2,13											
5.1.5	Contact Capacitance							2							
5.1.6	Temperature rise	2													
5.2.1	Mating force			4,7,10											
5.2.2	Un-mating force			5,8,11											
5.2.3	Reseating(3X)		5,8		8	6	5	5		4	4	6			
	Durability(50X)		3		3	3	3	3				3			
	Durability(1000X)			6											
	Durability(9000X)			9											
5.2.4	Mechanical shock				7										
5.2.5	Radom Vibration				5										
5.2.6	Sine Vibration				6										
5.3.1	Salt Spray						4								
5.3.2	Humidity- Temperature Cycling		7												
5.3.3	High-temperature and humidity										3				
5.3.4	Thermal shock		4												
5.3.5	Temperature life							4							
5.3.6	Low Temperature									3					
5.3.7	Thermal disturbance											5			
5.3.8	Thermal Cycling					5									
5.5.1	Solder-ability Test												2		
5.5.2	Solder peel off strength,													2	
5.6.1	IPX8 water proof														1
	Sample Quantity	5	5	5	5	5	5	5	5	5	5	5	5	5	5

7.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. The parts shall be carried in tape & reels inside boxes. For details refer to packaging spec.

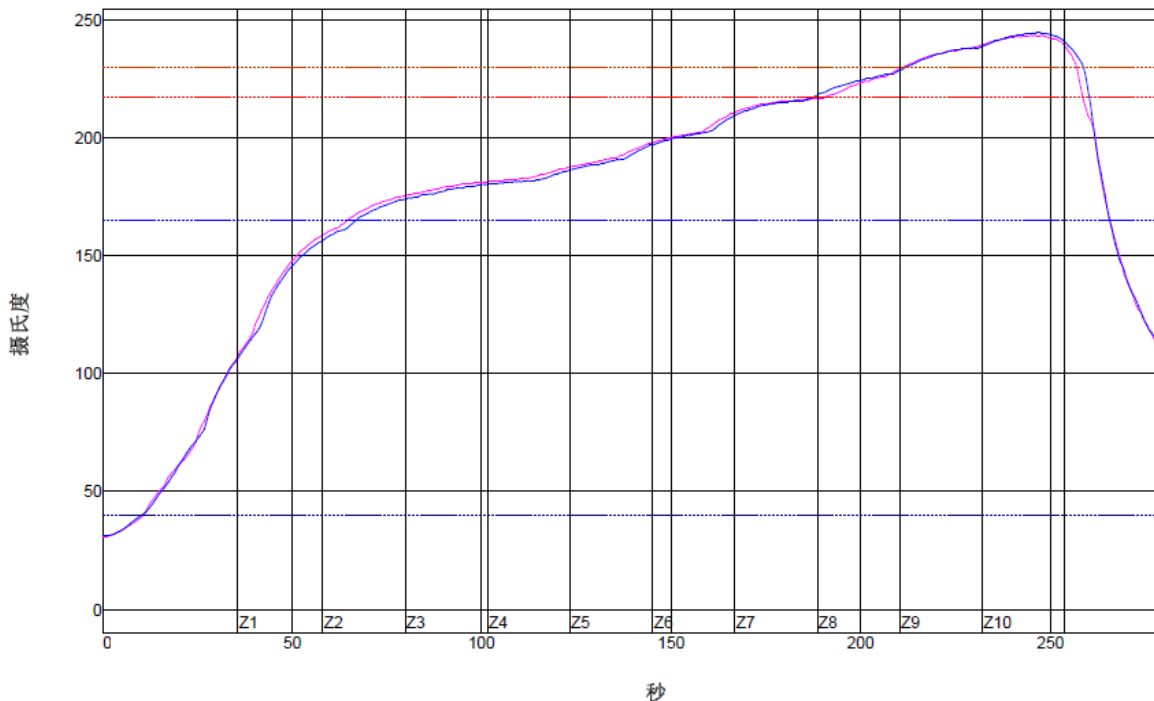
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8.0 CUSTOMER REFLOW PROFILE

温度设置 (摄氏度)										
温区	1	2	3	4	5	6	7	8	9	10
上温区	160	170	180	185	195	205	225	235	250	255
下温区	160	170	180	185	195	205	225	235	250	255
传送带速度 (公分/分):	95.0									



PWI= 121%	最高上升斜率	最高下降斜率	预热 40至165C	恒温时间165至217C	回流时间 /217C	最高温度	总时间 /230C
<TC2>	3.21 121%	-4.38 -69%	53.79 -114%	125.54 118%	68.51 5%	243.40 12%	45.82 67%
<TC3>	3.13 113%	-4.41 -70%	56.59 -108%	120.31 101%	73.17 25%	244.65 29%	46.79 74%
温差	0.08	0.03	2.80	5.23	4.66	1.25	0.97

制程界限:

锡膏: indium8点9			
统计数名称	最低界限	最高界限	单位
最高温度上升斜率 (目标=2.0) (计算斜率的时间距离= 20 秒)	1	3	度/秒
最高温度下降斜率 (计算斜率的时间距离= 30 秒)	-5	-1	度/秒
预热时间 40-165摄氏度	60	150	秒
恒温时间165-217摄氏度	60	120	秒
回流以上时间 - 217摄氏度	45	90	秒
最高温度	235	250	度 摄氏度
在230摄氏度以上时间	25	50	秒

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