

PRODUCT SPECIFICATION

Mini Cool Edge (MCIO) Connector for PCIe Series

DOCUMENT NUMBER:
PS-0030

REVISION:
AX03

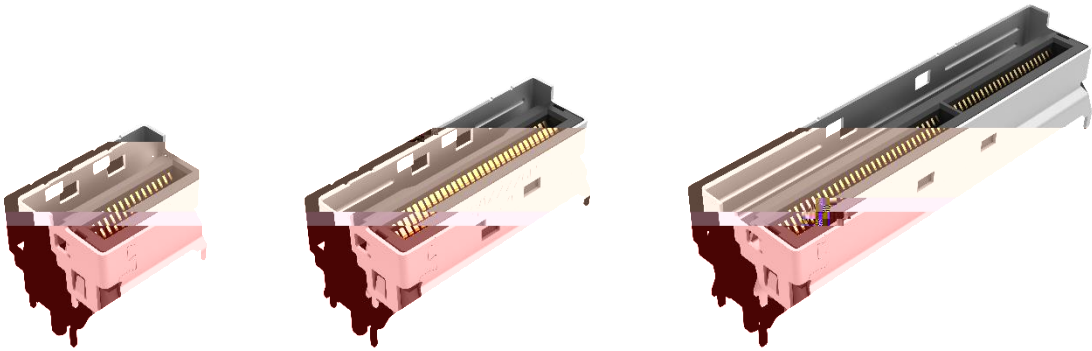
CREATED BY:
Brown

APPROVED BY:
James

DATE:
10/07/2023

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Mini Cool Edge (MCIO) Connector for PCIe 5.0/6.0 System



MCIO 4X-38Pos

MCIO 8X-74Pos

MCIO16X-124Pos

Rev.	Comments	Originator	Approval	Date
AX01	Initial	Brown	James Chen	04/12/2023
AX02	Add 4X and 16X Products	Brown	James Chen	07/07/2023
AX03	Add PCIe 6.0 series and Update Format	Brown	James Chen	10/07/2023

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1.0 SCOPE

This Product Specification covers performance, test, and reliability requirements of the [Zhaolong Mini Cool Edge \(MCIO\) Series connector for PCIe 5.0 /6.0 system](#).

2.0 PRODUCT DESCRIPTION

PRODUCT NAME AND SERIES NUMBER(S)

[02V1](#) Series: MCIO 8X-74Pos Vertical Connector for PCIe 5.0 Application

[02V2](#) Series: MCIO 4X-38Pos Vertical Connector for PCIe 5.0 Application

[02V3](#) Series: MCIO 16X-124Pos Vertical Connector for PCIe 5.0 Application

[12V1](#) Series: MCIO 8X-74Pos Vertical Connector for PCIe 6.0 Application

[12V2](#) Series: MCIO 4X-38Pos Vertical Connector for PCIe 6.0 Application

[12V3](#) Series: MCIO 16X-124Pos Vertical Connector for PCIe 6.0 Application

2.1 DIMENSIONS, MATERIS, PLATINGS AND MARKING

Housing

High temperature thermoplastic, UL94V-0

Color: Black

Contact

Copper Alloy

Contact area: Selected Gold plating

Solder area: Matte Tin plating

Under-plating: Nickel plating overall

Shell

Stainless steel

Solder area: Nickel under-plated

See Customer Drawing for more information on dimensions, material, plating and marking.

2.2 ENVIRONMENTAL CONFORMANCE

See Customer Drawing for information on dimensions, material, plating and marking.

2.3 PIN ASSIGNMENTS

Pin assignment may vary depending on the cable assembly configuration. Different configurations will have different part numbers within the series. Refer to the appropriate cable sales drawing of the specific part number for the correct pin assignment.

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 INDUSTRY DOCUMENTS

- EIA 364-1000 Environmental Test Methodology for Assessing the Performance of Connectors and Sockets Used in Controlled Environment Application
- EIA 364 Series Electrical Connector Test Procedures Including Environmental Classifications with Test Procedure
- PCI Express Card Electromechanical Specification 5.0 Rev 0.9
- Internal Cable Specification for PCI Express 5.0 and 6.0 Rev 0.7
- SFF-TA-1016 Internal Unshielded High Speed Connector System Rev 1.1
- SFF-TA-1024 Test Procedure for SFF-TA-1016 Mated Cable Assembly

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		R 20 milliohms maximum for signal contacts	Duration: 11 milliseconds 7 7 7 Quantity: 3 drops in each of 6 directions. Total of 18 drops per connector
6.2.11	Reseating	No evidence of physical damage	EIA 364-09 Manually mate and unmated the connector with add-in card for 3 cycles Rate: 5 cycles per minute

6.3 ENVIRONMENTAL PERFORMANCE

Item	Test Description	Requirement	Test Produce
6.3.1	Shock (Thermal)	No evidence of physical damage R 20 milliohms maximum for signal contacts	EIA 364-32, Method A, Table 2, Test Condition 1, Duration A-4 -55°C to 85°C, perform 5 cycles in mating Step: a.) -55 °C Duration 30 Minutes b.) Connector transfer time from cold to hot 5 MIN(Max) c.) 85 °C (+3/-0) Duration 30 Mini d.) Connector transfer time from hot to cold 5(min) MAX:
6.3.2	Temperature Life (Preconditioning)	No evidence of physical damage	EIA 364-17, Method A (without electrical load) Expose 72 hours at 105 ±2°C
6.3.3	Temperature Life	No evidence of physical damage R 20 milliohms maximum for signal contacts	EIA 364-17, Method A (without electrical load) Test Condition 2, Test Condition C Expose 120 hours at 105 ±2°C
6.3.4	Salt Spray	No evidence of physical damage R 20 milliohms maximum for signal contacts	EIA-364-26B Test condition: mated connector. a.) 5±1% salt. b.) temperature :35+1/-2°C. c.) Duration: 48 hours.
6.3.5	Solderability	95% of immersed area must show no voids or pin holes.	J-STD-002E Test Method A1: Temp:245°C±5°C Immerse and withdraw at 1 mm- 5 mm, per second

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			and dwell for 5 +0/-0.5 seconds, Leads and terminations shall have flux applied uniformly and to cover the surfaces to be tested.
6.3.6	Cyclic Temperature & Humidity	No Damage R 20 milliohms maximum for signal contacts	EIA 364-31B, a) Test condition: Method III without conditioning 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. b) Test Duration: 24 hours per cycle c) Number of cycles: Perform 24 continuous cycles.
6.3.7	Porosity Testing	No Damage	Tested in accordance with EIA 364-53, minimum of 10 contacts from 3 samples must be tested, optical microscope of 10X magnification concentrated reagent grade nitric acid: 75%+/-1% HNO3.
6.3.8	Mixed Flowing Gas (MFG)	No evidence of physical damage	EIA 364-65, Class IIA Exposure time per EIA 364-1000 Table 4.1 Expose 14 days (for 10-Year field life) in MFG chamber. Cl2: 10±3 ppb NO2: 200±50 ppb H2S: 10±5 ppb SO2: 100±20 ppb Temperature: 30±1°C
6.3.9	Thermal Disturbance	No evidence of physical damage	EIA 364-1000 Table 4 Cycle the connector between 15 ±3°C and 85 ±3°C , as measured on the part. Ramp rate shall be an average 2°C per minute. The minimum dwell time shall be 5 minutes after the specimens reached the chamber temperature. No humidity control. Perform 10 cycles
6.3.10	Temperature Rise	Maximum Temperature rise shall not exceed 30°C above ambient.	EIA 364-70 Method 3 Maximum of 6 adjacent pins per side and 12 pins in total are connected in series.

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			<p>A thermocouple is placed as close as possible to the contact interface Supply the rated current for a duration of 1 hour before measurement is taken.</p> <p>The ambient condition is still air at 25°C</p>
6.3.11	<p>Resistance to soldering heat (Infrareds reflow)</p>	<p>No evidence of physical damage</p>	<p>EIA-364-56 Procedure 6</p> <p>Average ramp rate: 1~4°C per second Test Level 3:</p> <p>Temperature (board surface):</p> <p>250 +10°C /-0°C</p> <p>Duration:30~35 seconds</p>

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8.0 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination		Test Groups														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
6.0.1	Examination of connectors	1,8	1,10	1,10	1,12	1,9	1,3	1,7	1,5	1,3	1,3	1,3	1,3	1,3	1,3	1
6.1.1	Low Level Contact Resistance (LLCR)	2,5,7	2,5,7,9	2,5,7,9	2,5,7,9,11	4,6			2,4							
6.1.3	Dielectric Withstanding Voltage					2,7										
6.1.4	Insulation Resistance					3,8										
6.2.1	Durability (Preconditioning)	3	3	3	3											
6.2.2	Durability					5										
6.2.3	Mating Force (Module only)							3,6								
6.2.4	Un-mating Force (Module only)															
6.2.5	Active Latch Retention Strength										2					
6.2.6	Wrenching strength (W/ mated Cable-Passive Latch)												2			
6.2.7	Wrenching strength (W/ mated Cable-Active Latch)														2	
6.2.8	Contact Normal Force											2				
6.2.9	Vibration			6												
6.2.10	Shock (Mechanical)			8												
6.2.11	Reseating	6	8		10			2,5								
6.3.1	Shock (Thermal)		4													
6.3.2	Temperature Life (Preconditioning)			4	4											
6.3.3	Temperature Life	4						4								
6.3.4	Salt Spray								3							
6.3.5	Solderability									2						
6.3.6	Cyclic Temperature & Humidity		6													
6.3.7	Porosity Testing															2
6.3.8	Mixed Flowing Gas (MFG)				6											
6.3.9	Thermal Disturbance				8											
6.3.10	Temperature Rise						2									
6.3.11	Resistance to soldering heat (Infrared reflow)										2					
Sample Size		5	5	5	5	5	5	5	5	5	5	5	5	3	3	3

Note:

1. Test specimen: 5 PCS/ group unless otherwise specified.
2. Test specimen shall be sure to meet the drawing before the testing.

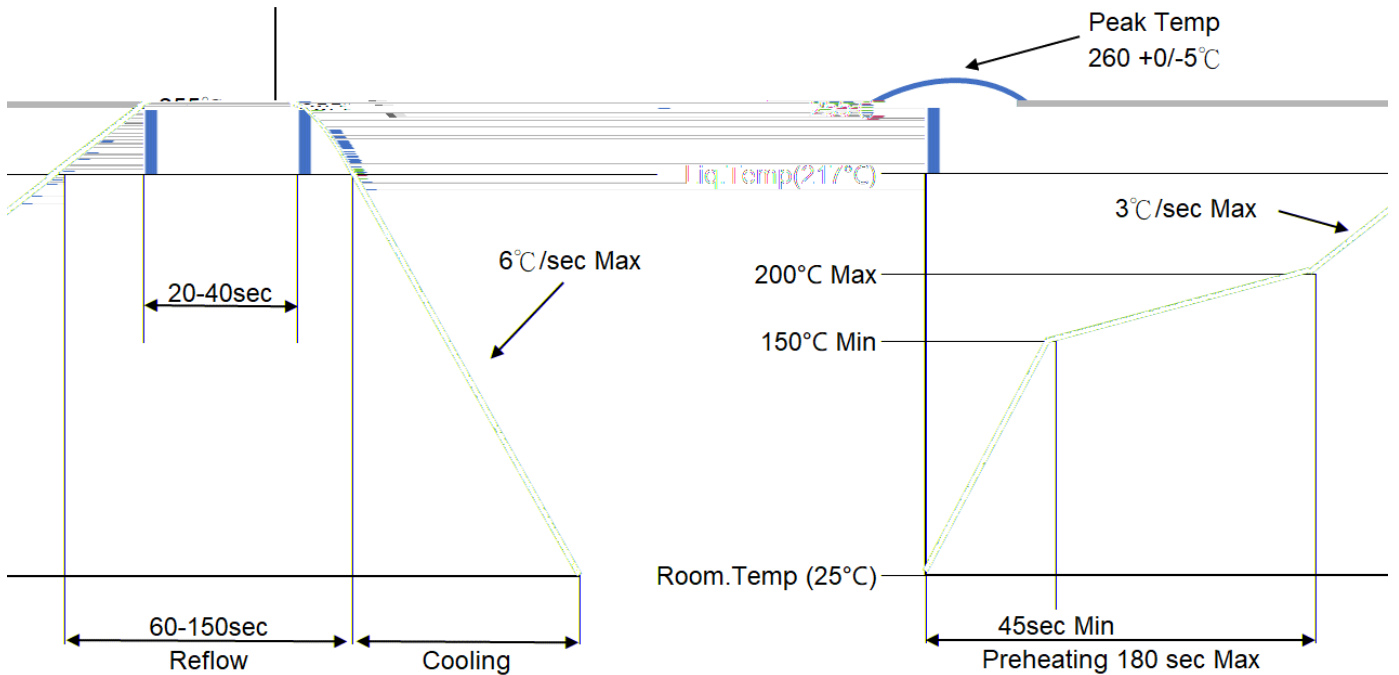
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9.0 PACKING

Parts shall be packaged in Tape and Reel or Tray to protect against damage during handling, transit, and storage.

10.0 GNERIC LEAD-FREE REFLOW PROFILE



FOR PEAK REFLOW **260°C**

LEAD-FREE PROFILE

Notes:

Temperature indicated refers to the PCB surface temperature at solder tail area.
 Connector can withstand up to 2 reflow cycles with a cool-down to room temperature in-between.
 Actual reflow profile also depends on equipment, solder paste, PCB thickness, and other components on the board. Please consult your solder paste and reflow equipment manufacturer for their recommendations to adopt a suitable process.