PRODUCT SPECIFICATION **PS-07853** Rev. **AX3**

Title: **Mini Cool Edge Connector Product Specification**

Part Number: **GH01/GH10 series**

Description: MCIO Connector, 0.6 Pitch, SMT Type

Revisions Control

Rev.	ECN Number	Originator	Approval	Issue Date
AX1	NA	Joan Lu		11.06.2023
AX2	NA	Joan Lu		07.08.2024
AX3	NA	Joan Lu		08.26.2024

Product Specification Origination

Originator:	Date:	Checked by:	Date:	Approved by:	Date:
Joan Lu	08.26.2024	Sondra Sang	08.26.2024	Hank Hsu	08.26.2024

1. Scope

This document defines the detailed requirements for the Amphenol GH01/GH10 Series MCIO connector to insure functionality and reliability.

2. Applicable documents

2.1	EIA-364 Standard	Test methods for electrical connectors
2.2	UL-STD-94	Tests for flammability of plastic materials for parts in devices and appliances.
2.3	PCI Express Card	PCI EXPRESS, Revision 6.0

3. Requirements

3.1 Design and construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Material and finish

3.2.1 Housing

- High temperature thermoplastic, UL94V-0
- Color: Black

3.2.2 Contact

- Copper Alloy
- Contact area: Selected Gold plating
- Solder area: Matte Tin plating
- Under-plating: Nickel plating overall

3.2.3 Shell

- Stainless steel

  Solder area: Nickel under-plated overall

3.3 Rating

- Current: 1.1 A per pin up to 6 pairs
- Voltage: 30 VDC per contact
- Temperature:

  Operating: -40°C~ 105°C

  Non-operating: -55°C~ 105°C

4. Performance and testing

4.1 Test requirements and procedures summary

Test	Test procedure	Test criteria		
Visual & Dimensional inspection	EIA-364-18 Visual, dimensional and functional inspection.	Must meet the minimum requirements specified by product drawing.		
Electrical:				
Low level Contact Resistance	EIA-364-23 Current : 100 mA maximum Voltage : 20 mV maximum	Initial: Baseline After test: ΔR=20 milliohms maximum		
Dielectric Withstanding Voltage	EIA-364-20 Apply a voltage between adjacent terminals. Voltage: 300 VAC Duration: 1 minute	No defect or breakdown No disruptive discharge No leakage current in excess of 0.5mA		
Temperature Rise (via current cycling)	EIA-364-70 Measure the temperature rise at the rated current. Ambient temperature: 25℃	30℃ maximum change from initial		
Insulation Resistance	1000MΩminimum	EIA-364-21 Test voltage 100V DC. Duration: 1 minute Measure between adjacent signal contacts.		
High Speed Electrical Requirements				
	Insertion Loss	**Return Loss**	**Power-sum FEXT**	
PCIe 6	-0.5dB at 16GHz	-15dB at 16GHz	-46.6dB at 16GHz	
Mechanical:				
Durability (preconditioning)	EIA-364-09 20 unmate/mate cycles	No evidence of physical damage.		
Durability	EIA-364-09 Cycle rate: 500±50 per hour Number of cycles: 200 cycles for 30μ" Au plating 100 cycles for 15μ" Au plating	No evidence of physical damage.		
Mating Force (Module only)	EIA-364-13 Rate: 25.4 mm/minute	1.1 N Max./per pair pin		

Un-mating Force (Module only)	EIA-364-13 Rate: 25.4 mm/minute	0.1 N Min./per pair pin
Active Latch Retention Strength	EIA-364-13 Rate: 25.4 mm/minute Pull in direction parallel to insertion, hold for minimum of 60 seconds	50 N minimum
Wrenching strength (W/ mated Cable-Active Latch)	Bend cable 90° at minimum bend radius. Pull in 4 axis directions for round cable. Pull in 2 axis directions for flat cable. No damage to plug/ cable assembly.	25 N minimum
Contact Normal Force	EIA-364-04 Rate: 25.4 mm/minute	0.49 N (50 grams) minimum at nominal
Vibration	EIA-364-28, Test Condition VII, Condition D Subject mated specimens to 3.10 G's rms between 20-500 Hz for 15 minutes in each of 3 mutually perpendicular planes.	No Damage No discontinuity longer than 1usec allowed. 20 milliohms maximum change from initial (baseline) contact resistance
Mechanical Shock	EIA-364-27, Test Condition H Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.	No Damage 20 milliohms maximum change from initial (baseline) contact resistance
Reseating	Manually unmate/mate the connector 3 cycles.	No evidence of physical damage.
Environmental:		
Thermal Shock	EIA-364-32, Method A Test condition 1 -55 ℃ to 85 ℃, perform 5 cycles in mating condition	No Damage 20 mOhms maximum change from initial (baseline) contact resistance
Humidity-Temperature Cycling	EIA-364-31, Method III	No Damage 20 mOhms maximum change from initial (baseline) contact resistance

Temperature Life (preconditioning)	EIA-364-17, Method A Subject mated specimens to 105℃ for 72 hours	No Damage
Temperature Life	EIA-364-17, Method A Test Condition 2, Test Time Condition C Subject mated specimens to 105℃ for 120 hours	No Damage 20 mOhms maximum change from initial (baseline) contact resistance
Mixed flowing gas (MFG)	EIA-364-65, class IIA Test condition: mated connector. RH: 70±2% Temperature: 30±1℃ Cl_2 : 10±3 ppb NO_2 : 200±50 ppb H_2S : 10±5 ppb SO2 : 100±20 ppb Duration: 7 days	No evidence of physical damage
Salt Spray	EIA-364-26B Test condition: mated connector. a.) 5±1% salt. b.) temperature :35±2℃. c.) Duration: 48 hours.	No evidence of physical damage LLCR Initial: baseline After test: ΔR=20 milliohms maximum
Solderability	J-STD-002E Test Method A1: Temp:245℃±5° C, Immerse and withdraw at 1 mm - 5 mm, per second and dwell for 5 +0/-0.5 seconds, Leads and terminations shall have flux applied uniformly and to cover the surfaces to be tested.	95% of immersed area must show no volids or pin holes.
Resistance to soldering heat (Infrared reflow)	EIA-364-29 Temperature(board surface): 250 +10℃/-0℃ Duration:30~35 seconds	No evidence of physical damage

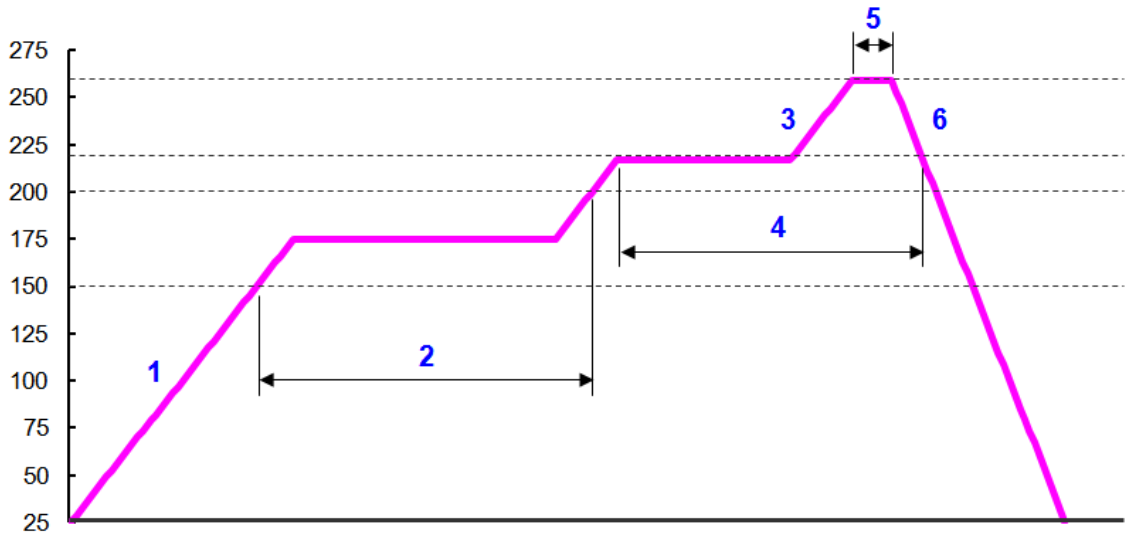
4.2 Test Sequence

Test or Examination	Test Groups													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Examination of connector(s)	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
Current Rating						2								
LLCR	2,5,7	2,5,7,9	2,5,7,9	2,5,7 9,11	4,6			2,4						
Insulation Resistance					3,8									
Dielectric Withstanding Voltage					2,7									
Durability					5									
Durability (Preconditioning)	3	3	3	3										
Matting/un-mating Force							3,6							
Reseating	6	8		10			2,5							
Thermal Shock		4												
Humidity-Temperature Cycling		6												
Thermal disturbance				8										
Temperature Life	4						4							
Temperature Life (Preconditioning)			4	4										
Mechanical Shock			8											
Vibration			6											
Salt Spray								3						
Mix Flowing Gas(MFG)				6										
Solder ability									2					
Resistance to Soldering Heat										2				
Active Latch Retention Strength											2			
Contact Normal Force												2		
Sample size	5	5	5	5	5	5	5	5	5	5	5	5	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.

4.3 Recommended IR reflow profile(Lead-free)



1, 3	Average ramp-up rate	3°C/second max.
2	Preheat - Temperature Min - Temperature Max - Pre-heat time	 150°C 200°C 60-180 seconds
4	Time maintained above - Temperature - Time	 217°C 60-150 seconds
5	Peak temperature Time within 5°C of actual peak	260°C 20-40 seconds
6	Ramp-down Rate	6°C/second max.
	Time 25°C to peak Temperature	8 minutes max.