TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION：A0	STATUS：OFFICIAL RELEASE
	DATE：2023/09/20	CLASSIFICATION：

1.0 SCOPE

This specification is applicable to the termination characteristics of PCI Express Card Electromechanical Specification and certain customer specifications not covered by the PCI-SIG document.

2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

The following document for part of this specification to the extent specified here with. In the event of conflict between the requirements of the specification and the referenced documents. This specification shall take precedence.

EIA-364 Test methods for electrical connectors
MIL-STD-202F Test methods for electrical component parts
Underwriters' Laboratories, Inc.
UL-STD-94Tests for flammability of plastic materials for parts in devices and appliances.

3.0 REQUIREMENTS

3.1 Materials

3.1.1 Insulator
High temperature thermoplastic, UL94V-0 rated
Color- Black

3.1.2 Contacts
Copper alloy
Contact area: 15micro inches minimum of gold
Solder area: Matte tin plating
Under plate: Nickel under plating overall

3.1.3 Solder pad
Stainless steel
Solder area- Matte tin plating
Under plating- Nickel under plating overall

3.1.4 Ground pin
Stainless steel

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

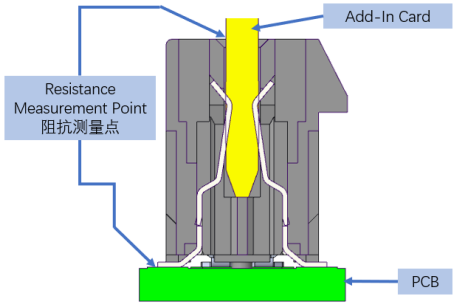
3.2 Ratings

3.2.1 Voltage: 30 Volts AC/DC for all contacts
3.2.2 Current: 1.1A max per contact
3.2.3None operating Temperature: -55° C ~ 105° C
3.2.4 Temperature: Field:65° C

4.0 TEST REQUIREMENTS AND PROCEDURES SUMMARY

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.1	Examination of Product	EIA-364-18 Visual, dimensional and functional inspection	Meets requirements of product drawing. No physical damage.

ELECTRICAL REQUIREMENT

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.2	Low Level Contact Resistance	EIA-364-23 Subject mated connector with a max. voltage of 20mV and current of 100mA 	Initial:30 mΩmax Final:ΔR: 10 mΩmax
4.3	Dielectric withstanding Voltage	EIA-364-20 C-B Subject unmated connector with a voltage of 500 VAC for 1.0 minute between adjacent terminals. Current leakage:0.5A Max.	No Breakdown

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

4.4	Insulation Resistance	EIA-364-21 Subject unmated and dismount connectors with a. voltage of 500 VDC between adjacent terminals and between terminal to ground.	1000M Ohms min
4.5	Contact current rating	EIA 364-70 method 2 The sample size is a minimum of three mated connectors. The sample shall be soldered on a board with the appropriate footprint. Wire the nine power pins (B1, B2, B3, A2, A3, B8, A9, A10, and B10) and the nine nearest ground pins (A4, B4, B7, A12, B13, A15, B16, B18, and A18) in a series circuit. The mated Add-in Card is included in this circuit. The Add-in Card shall have 1 oz. copper traces and its mating geometry shall conform to the applicable PCI Express drawings. A thermocouple of 30 AWG or less shall be placed on the card edge-finger pad (pins B2 and A9) as close to the mating contact as possible. Conduct a temperature rise vs. current test.	1.1 A per pin minimum The temperature rise above ambient shall not exceed 30℃. The ambient condition is still air at 25℃.

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

MECHANICAL REQUIREMENT

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.6	Insertion Force	Insert a steel blade of 1.70mm at a rate of 25.4mm per minute max See fig.1for blade details **Per EIA-364-13**	1.15N max per contact pair
4.7	Withdrawal Force	Withdrawal a steel blade of 1.44mm at a rate of 25.4mm per minute max See fig.1for blade details **Per EIA-364-13**	0.15N min per contact pair
4.8	Contact Retention Force	**EIA-364-37** The end of a post shall be pulled in a perpendicular to base housing at a contact speed of 12.7 mm/ min.	5N min per terminal
4.9	Solder Pad Retention Force	**EIA-364-37** Measure force to pull out terminals at a speed rate of 12.7mm/ min.	12N min
4.10	Durability	**EIA-364-09** Mate/Un-mate P.C.B for 50 cycles at a rate of 25.4mm per minute max	Contact resistance: 10mΩchange from initial
4.11	Random Vibration	**EIA-364-28,VII-D Test** Subject mated connectors to 3.1g’ s RMS. 15minutes in each of three mutually perpendicular planes.	Contact resistance: 10 mΩ change from initial Discontinuity : No greater than 1.0 micro second

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION：A0	STATUS：OFFICIAL RELEASE
	DATE：2023/09/20	CLASSIFICATION：

4.12	Mechanical Shock	**EIA-364-27** Accelerate of 50G,11 ms duration sine half wave waveform ,3 cycle in each of then 3 axis	Contact resistance: 10 mΩ change from initial Discontinuity : No greater than 1.0 micro second

ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.13	Cyclic Temperature and Humidity	**EIA-364-31, Method III** Subject mated specimens to 10 cycles(10 days) between 25 and 65◦C at 90 to 95% R.H	Appearance: No damage
4.14	Temperature Life	**EIA-364-17 method A** Mated, +105±3° C for 168 hours	No evidence of physical damage and ΔR:10 mΩ max
4.15	Thermal Shock	**EIA-364-32, method A, condition 1** Mated, 10 cycles of -55° +0/-3° C for 30 minutes. +25+10/-5° C for 5 minutes. +85+3/-0° C for 30 minutes. max.	No evidence of physical damage and ΔR:10 mΩ max
4.16	Solder ability	**EIA-364-638** Steam age 1hrs. +/-5 min., Solder time to be 5+/-0.5 seconds at 245+/-5° C, using non-activated flux	90% of immersed area must show no voids and pin holes 90%吃锡
4.17	Resistance to soldering heat (Infrared reflow)	**EIA-364-638** Average ramp rate: 1~4℃ per second Temperature(board surface): 260 +5℃/-5℃ Duration:20~40 seconds	Appearance: No damage

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

HIGH SPEED CHARACTERIZATION

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4.18	Differential Impedance	Rise Time 250ps (20~80%)	85Ω±15Ω
4.19	Differential Insertion Loss	[-0.1 - 0.0875 *] dB for f ≤16 GHz; [3.5 – 0.3125* f] dB for 16 < f ≤24 GHz	EIA-364-101
4.20	Differential Return Loss	[-20 + 0.625* f] dB for f ≤16 GHz; [-24 + 0.875* f] dB for 16 < f ≤24 GHz	EIA-364-108
4.21	Differential Near End Crosstalk	[1.5* f – 60] dB for f ≤10 GHz; [(5/6)* f – 53.33] dB for 10 < f ≤24 GHz; ccICNNEXT ≤ 250 μV for $f$max = 24 GHz	EIA-364-90
4.22	Differential Far End Crosstalk	[1.5* f – 60] dB for f ≤10 GHz; [(5/6)* f – 53.33] dB for 10 < f ≤24 GHz; ccICNNEXT ≤ 250 μV for $f$max = 24 GHz	EIA-364-90

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

5.0 PRODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE:

Test or Examination	Test Group										
	A	B	C	D	E	F	G	H	I	J	K
Examination of Product	1,6	1,5	1,4	1,5	1,5	1,5	1,5	1,8	1,5	1,5	1,3
Low Level Contact Resistance	2,5	2,4		2,4	2,4	2,4	2,4		2,4	2,4	
Dielectric withstanding Voltage								3,7			
Insulation Resistance								2,6			
Temperature Rise				3							
Insertion Force	3										
Withdrawal Force	4										
Contact Retention Force			2								
Solder Pad Retention Force			3								
Durability (Preconditioning)											
Durability		3									
Vibration									3		
Mechanical Shock										3	
Cyclic Temperature and Humidity						3		5			
Resistance to Solder Heats											
Temperature Life					3						
Thermal Shock							3	4			
Mixed Flowing Gas											
Thermal Disturbance											
Solderability											2
Sample size	5	5	5	5	5	5	5	5	5	5	5

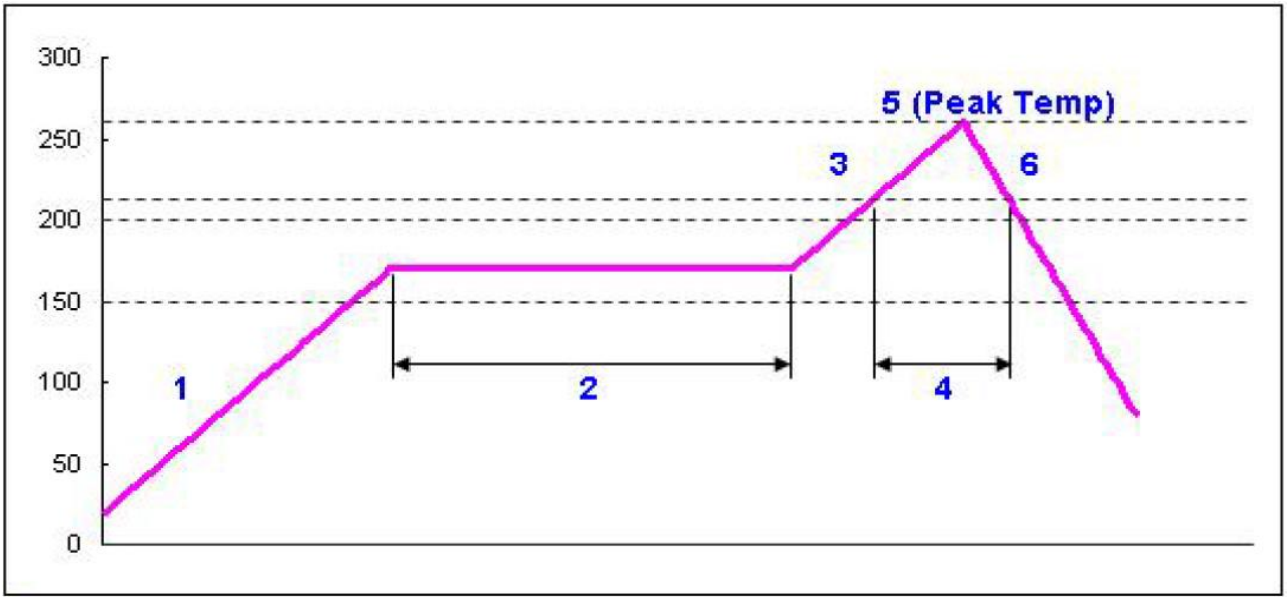
NOTE: (a) Numbers indicate sequence in which tests are performed.
(b) Discontinuities shall not take place in this test group, during tests.

TITLE	DOC No.	
PCI EXPRESS GEN 5.0 SPEC	REVISION : A0	STATUS : OFFICIAL RELEASE
	DATE : 2023/09/20	CLASSIFICATION :

6.0 PACKAGING

Parts shall be packed in trays and protected against damage during handling, transportation and storage.

7.0 Recommended IR Reflow Profile (Lead-free)



1	Average ramp rate	3℃ per second Max
2	Pre-heat temp.(Min)	150℃
	Pre-heat temp.(Max)	200℃
	Pre-heat time	60 to 120 seconds
3	Ramp to peak	3℃ per second Max
4	Time over liquidus(230℃)	60 to 150 seconds
5	Peak temp.	250+10/-0℃
	Time within 5℃ of peak	10seconds Max
6	Ramp-cool down	6℃ per second Max
7	Time 25℃ to peak	8 minutes Max