SX-M2

Part No. 21065-067E-01

Product Specification

Qualification Test Report No. TR-25032

1	S26106	2026/03/26	T. Minohara	M. Muro	H. Ikari
0	S25396	2025/09/30	M. Muro	-	T. Masunaga
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Scope

This product specification defines the test conditions and the performances of the M.2 connector SX-M2.

2. Product Name and Parts No.

2.1. Product Name

SX-M2

2.2. Parts No.

21065-067E-01

3. Rating

3.1. Applicable Card

Based on PCI Express M.2 Specification.

3.2. Operating Conditions

Amperage: 0.5A AC/DC (per contact)
Voltage: 35V AC (per contact)
Operating temperature: 233 to 353K (-40℃ to +80℃) (Containing temperature rise by current)
Operating humidity: 95% max

3.3. Storage Conditions

Storage temperature: After soldering 233 to 398K (-40℃ to +85℃)
Before soldering 233 to 328K (-40℃ to +55℃)
Storage humidity: 85% max. (Non-condensing)

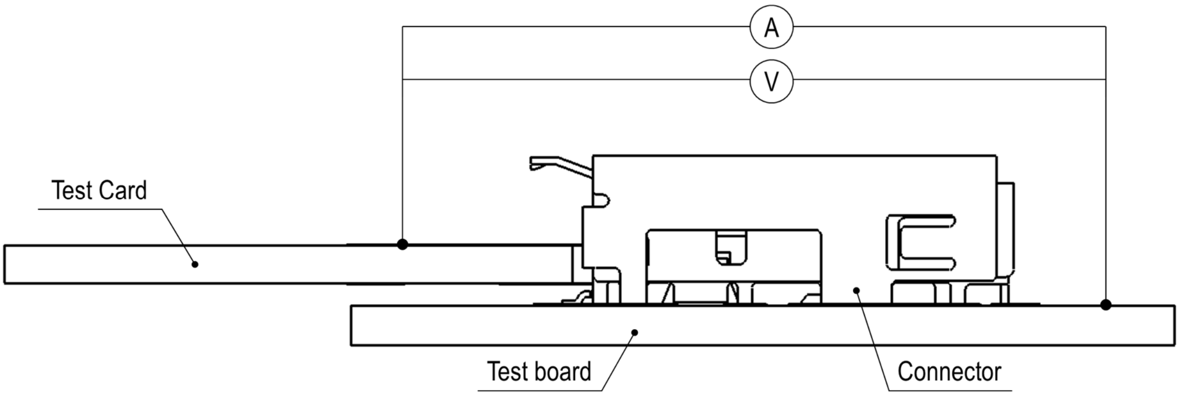
4. Test and Performance

Test Condition

Unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with PCI Express M.2 Specification.

Temperature: 288K to 308K (15℃ to 35℃)
Pressure: 866hPa to 1066hPa (650mmHg to 800mmHg)
Relative humidity: 45 to 75% R.H.

4.1. Electrical Performance

1. Contact resistance (LLCR)	
Reference standard:	EIA-364-23
Test conditions:	Solder the connector to the test board and mate the card together, then apply 20mV MAX. DC open circuit voltage and 10mA MAX. DC closed circuit current. Measure the contact resistance at the section shown in Fig.1 by the four terminal methods.  Fig.1
Pass criteria:	Signal Contact Initial: 55mΩ MAX. After testing: ⊿R20mΩ MAX.

2. Dielectric withstanding voltage	
Reference standard:	EIA-364-20
Test conditions:	Mate the connector and the card together, then apply AC 300V (rms) between the neighboring contacts for a minute.
Pass criteria:	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

3. Insulation resistance	
Reference standard:	EIA-364-21
Test conditions:	Mate the connector and the card together, and then apply DC 500V between the neighboring contacts.
Pass criteria:	500MΩ MIN.

4. Temperature rise versus current	
Reference standard:	EIA-364-70 Method 2
Test conditions:	Mate the connector and the card together and apply rating current per contact. Measure delta T over ambient.
Pass criteria:	Over ambient ⊿T30℃ MAX.

4.2. Mechanical Performance

1. Mating and Unmating force	
Reference standard:	EIA-364-13 Method A
Test conditions:	Solder the connector to the test board, then place the board and the card push-on/pull-off machine. Repeat mating/unmating 60 cycles at a speed 25±3mm/min. along the mating axis. Measure the mating and unmating force at the initial and after 60 cycles.
Pass criteria:	Mating force: 25N MAX. Unmating force: 25N MAX.

2. Durability (preconditioning)	
Reference standard:	EIA-364-09
Test conditions:	Solder the connector to the test board, then place the board and card on the push-on/pull-off machine, and repeat mating and unmating 20 cycles.
Pass criteria:	Appearance: No abnormality adversely affecting the performance shall occur.

3. Durability	
Reference standard:	EIA-364-09
Test conditions:	Solder the connector to the test board, then place the board and card on the push-on/pull-off machine, and repeat mating and unmating 60 cycles at a speed 25±3mm/min. along the mating axis.
Pass criteria:	Contact resistance: Shall meet 4.1.1

4. Reseating	
Reference standard:	EIA-364-09
Test conditions:	Solder the connector to the test board, and manually mating and unmating the connector. Perform 3 such cycles.
Pass criteria:	Appearance: No abnormality adversely affecting the performance shall occur.

5. Vibration	
Reference standard:	EIA-364-28 Test condition VII, Test condition letter D
Test conditions:	Solder the connector to the test board, then mate card, and place them on the vibrator. Then apply the following vibration. During the testing, run 100mA DC to check electrical discontinuity. Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against another. Frequency: 50Hz-200Hz Directions: 3 mutually perpendicular direction. Power spectral density: 0.02 G2/Hz, 15 minutes Overall RMS: 3.10G
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

6. Shock	
Reference standard:	-
Test conditions:	Solder the connector to the test board, then mate card, and place them on the shock machine. Then apply the following shock. During the testing, run 100mA DC to check electrical discontinuity. MAX.G: 300G Duration: 2 msec. Wave Form: Half Sinusoidal Directions: On all 6 axis
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than 1μs shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

4.3. Environmental Performance

1. Thermal shock	
Reference standard:	EIA-364-32 Method A, Test Condition I, Test durations A-4
Test conditions:	Solder the connector to the test board, then mate card, and expose them to the following environment. Temperature: 218K (-55℃), 2 hours → 358K (+85℃), 2 hours Transition time: 5 min. MAX. Cycle: 10 cycles
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

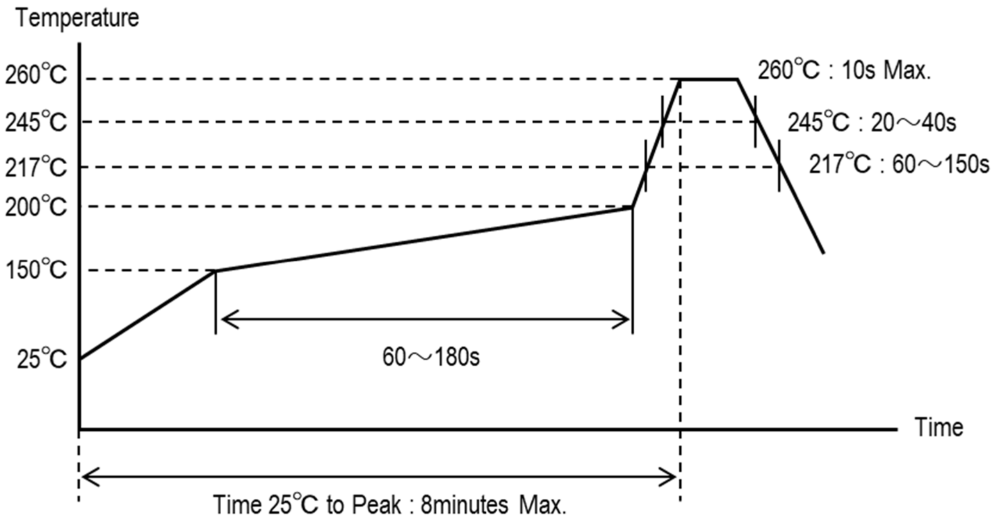
2. Temperature life	
Reference standard:	EIA-364-17 Method A
Test conditions:	Solder the connector to the test board, then mate card, and expose them to the following environment. Temperature: 378±2K (105±2℃) Duration: 120 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

3. Temperature life (preconditioning)	
Reference standard:	EIA-364-17 Method A
Test conditions:	Solder the connector to the test board, then mate card, and expose them to the following environment. Temperature: 378±2K (105±2℃) Duration: 72 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

4. Humidity (Cycling)	
Reference standard:	EIA-364-31 Method III without conditioning,
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature / Humidity: 298K (25℃) / 80%RH ～ 338K (65℃) / 50%RH Dwell times: 1 hour Ramp times: 0.5 hour Duration: 24 cycles (72 hours)
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

4.4. Others

1. Solderability	
Reference standard:	-
Test conditions:	Immerse the contact soldering part to flux of RMA or R type for 5 to 10 seconds, then dip the part into the solder bath of 518±3K (245±3℃) for 3±0.3 seconds.
Pass criteria:	More than 95% of the dipped surface shall be evenly wet.

2. Resistance to soldering heat	
Reference standard:	-
Test conditions:	Reflow temperature: See Fig.2. Cycle: 2  Fig. 2
Pass criteria:	No deformation nor defect adversely affecting the performance occur.

4.5. Test Sequence and Specimen Quantity

Details of the Testing Groups A to H are indicated in test report.

Table.1 Test Sequence and Sample Quantity

No.		Test Item	Testing Groups							
			A	B	C	D	E	F	G	H
4.1 Electrical Performance	1	Contact resistance (LLCR)	1,4,6	1,4,6,8	1,4,6,8	2,6,10 (※1)				
	2	Dielectric withstanding voltage					1			
	3	Insulation resistance					2			
	4	Temperature rise versus current						1		
4.2 Mechanical Performance	1	Mating force				1,5,9 (※1)				
		Unmating force				3,7,11 (※1)				
	2	Durability (preconditioning)	2	2	2					
	3	Durability				4,8				
	4	Reseating	5	7						
	5	Vibration			5					
	6	Shock			7					
4.3 Environmental Performance	1	Thermal shock		3						
	2	Temperature life	3							
	3	Temperature life (preconditioning)			3					
	4	Humidity (Cycling)		5						
4.4 Others	1	Solder ability							1	
	2	Soldering heat resistance								1
Specimen quantity			5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.

※ Numbers indicate test sequences.

※1 Measure Mating/Unmating force and Contact resistance (Group D) at initial, 30th cycle, 60th cycle.

5. Recommended Metal Mask

Refer to drawing for the recommended metal mask thickness and opening dimension.

6. Precautions for Handling SX-M2 Connector

Refer to instruction manual: HIM-25025 for the handling of SX-M2.