

M.2 (NGFF) Mini Card Socket

PRODUCT SPECIFICATION

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REVERSION	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED

Document Name: Product Specification	Production Name: M.2 (NGFF) Mini Card Socket	Document No: SPS-HN01-01
		Page: 1 of 5
		Rev.: X1

1. Scope

This specification covers the material and performance requirements for the **M.2 (NGFF) Mini Card Socket**.

2. Applicable documents

In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification take precedence.

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

Must be compatible with lead-free soldering process

Housing: High Temperature Thermoplastic UL94-V0;

Contact: Copper Alloy, Gold plated at mating area & solder tail, all over Nickel;

Solder: Steel Alloy, G/F plated;

3.3 Ratings

Voltage Rating: 50V AC;

Current Rating: 0.5 A

Operating Temperature: -40°C ~ +80°C.

4. Test requirement and procedures summary

4.1 Examination of product

Test	Requirements	Test Procedure
Examination of product	Meets requirements of applicable product drawing and specification	Visual, dimensional and functional per applicable quality inspection plan
4.2 Electrical Performance requirements		
Test	Requirements	Test Procedure
Contact Resistance (Low Level)	55 mΩ Max (initial) 20 mΩ Max change allowed final	Mated contacts assembled in housing; 20mV Max, 100mA max. (EIA-364-23)
Insulation Resistance	500 MΩ (Min), 500V DC	Impress Voltage 500V DC. Test between adjacent circuits of unmated connectors. (EIA-364-21)

Document Name: Product Specification	Production Name: M.2 (NGFF) Mini Card Socket	Document No: SPS-HN01-01
		Page: 2 of 5
		Rev.: X1

Test	Requirements	Test Procedure
Dielectric withstanding Voltage	300V AC RMS (min) at sea level No discharge, flashover or breakdown.	300V AC for 1 min. Test between adjacent circuits of unmated connectors. (EIA-364-20)
Current Rating	0.5A/power contact (continuous) The temperature rise above ambient shall not exceed 30°C, The ambient condition is still air at 25°C.	EIA-364-70 method 2

4.3 Mechanical performance requirements

Test	Requirements	Test Procedure
Mating force	20N Max. 1. Insert the card at 20° 2. Rotate the card into position	Operation speed: 100mm/min. Measure the force required to mate connector. (EIA-364-13)
Unmating force	20N Max. Reverse the installation sequence to unmating	Operation speed: 100mm/min. Measure the force required to unmate connector (EIA-364-13)
Durability	1. Contact Resistance 20 mΩ Max change allowed final 2. No evidence of physical damage	Mating/unmating 60 cycles (EIA-364-09)
Durability (preconditioning)	No evidence of physical damage	Mating/unmating 20 cycles (EIA-364-09)
Reseating	1. Contact Resistance 20 mΩ Max change allowed final 2. No evidence of physical damage	Manually unplug/plug the connector. Perform 3 such cycles.
Physical Shock	1. No electrical discontinuity of 0.1μsec or longer duration. 2. No evidence of physical damage	Accelerated Velocity: 285G Wave form: Half sin, Duration: 2msec. Number of Drops: 6 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. (EIA-364-27)
Vibration	1. No electrical discontinuity of 0.1μsec or longer duration. 2. No evidence of physical damage	EIA-364-28, test condition VII, test condition letter D (15 minutes in each of 3 mutually perpendicular directions.

4.4 Environmental performance requirements

Thermal Shock	1. Contact Resistance 20 mΩ Max change allowed final 2. No evidence of physical damage	Mated connectors. -55°C ~ +85°C for 30 minutes/cycle, repeat 10 cycles. (EIA-364-32 test condition I)
Temperature Life	1. Contact Resistance 20 mΩ Max change allowed final 2. No evidence of physical damage	Mated connector. 105°C Duration: 120H (EIA-364-17)
Temperature Life (Preconditioning)	1. Contact Resistance 20 mΩ Max change allowed final 2. No evidence of physical damage	Mated connector. 105°C Duration: 72H (EIA-364-17)

Document Name: Product Specification	Production Name:	Document No:
	M.2 (NGFF) Mini Card Socket	SPS-HN01-01
		Page: 3 of 5
		Rev.: X1

Test	Requirements	Test Procedure
Thermal Disturbance	<ol style="list-style-type: none"> Contact Resistance 20 mΩ Max change allowed final No evidence of physical damage 	Cycle the connector between 15°C +/-3°C and 85°C +/-3°C, as measured on the part. Ramps should be a minimum of 2°C/Min., 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.
Temperature-Humidity Cycle test	<ol style="list-style-type: none"> Contact Resistance 20 mΩ Max change allowed final No evidence of physical damage 	Mated Connector Initial measurement, cold shock and vibration. Except 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. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles. EIA-364-31, method III
Mixed flowing gas	<ol style="list-style-type: none"> Contact Resistance 20 mΩ Max change allowed final No evidence of physical damage 	EIA-364-65, class IIA , 5days (120Hrs) to simulate 3years)
Salt Spray	20 mΩ Max change allowed final	Subject mated connectors to 5% salt concentration for 24 hours. (EIA-364-26)
Solderability	Wet Solder Coverage: 95% Min.	Solder Temperature: 265 ±5°C Immersion Duration: 3 ±0.5 seconds (EIA-364-56)
Resistance to Reflow Soldering Heat	No physical damage shall occur	Test connector on PCB Pre-Heat 100~150°C: 60sec.Max. Heat 220°C Min.: 30sec.Max Heat Peak 265°C Max. See figure-1 (EIA-364-56)

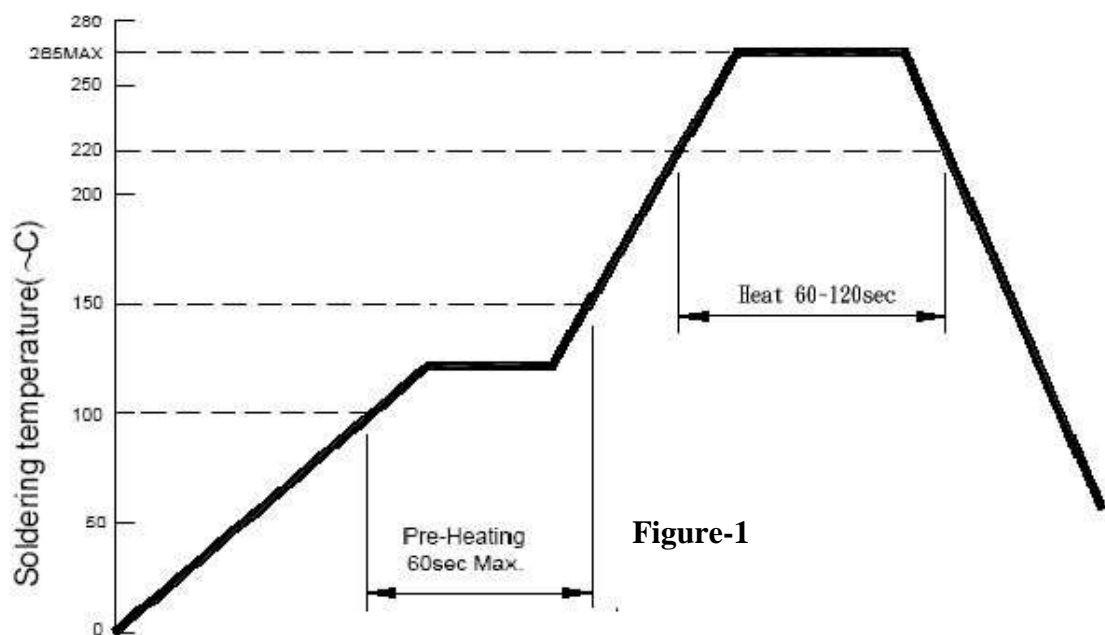


Figure-1

Document Name:	Production Name:	Document No:
Product Specification	M.2 (NGFF) Mini Card Socket	SPS-HN01-01
		Page: 4 of 5
		Rev.: X1

Test	Requirements	Test Procedure
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4.5 High Frequency performance requirements

Test	Requirements	Test Procedure
Differential Impedance	$85 \Omega \pm 10 \Omega$	EIA-364-108
Differential Insertion Loss (DDIL)	$\geq -0.5\text{dB}$ up to 4Ghz; $\geq -1.0\text{dB}$ up to 8Ghz	EIA-364-101
Differential Near End Crosstalk (DDNEXT)	$\geq -36\text{dB}$ up to 4Ghz; $\geq -32\text{dB}$ up to 8Ghz	EIA-364-101
Differential Far End Crosstalk (DDFEXT)	$\geq -40\text{dB}$ up to 4Ghz; $\geq -32\text{dB}$ up to 12Ghz	EIA-364-101



Document Name: Product Specification	Production Name: M.2 (NGFF) Mini Card Socket	Document No: SPS-HN01-01
		Page: 5 of 5
		Rev.: X1

4.6 Product qualification and requalification test

Test or Examination	Test Group						
	A	B	C	D	E	F	G
Examination of product	1,4,7,9,12	1,4,7,9,12,15	1,4,7,9,12	1,4,7,9,12,15,18	1,4,9	1,4,7	1,4
Contact Resistance (low level)	5,10,13	5,10,13,16	5,10,13	5,10,13,16,19	5,10	5,8	
Insulation Resistance					12		
Dielectric withstanding Voltage					11		
Current Rating							
Total mating force					6		
Total unmating force					7		
Durability					8		
Durability (preconditioning)	6	6	6	6			
Reseating	11	14		17			
Physical Shock							
Vibration			11				
Thermal Shock		8					
Temperature Life	8						
Temperature Life (Preconditioning)			8	8			
Thermal Disturbance				14			
Temperature-Humidity Cycle test		11					
Mixed flowing gas				11			
Salt Spray						6	
Solderability	3	3	3	3	3	3	3
Resistance to Reflow Soldering Heat	2	2	2	2	2	2	2
Differential Impedance							5
Differential Insertion Loss (DDIL)							6
Differential Near End Crosstalk							7
Differential Far End Crosstalk							8

Note: Test 4pcs samples/test group