



# PRODUCT SPECIFICATION

## SAS/ PCIe RIGHT ANGLE SMT PLUG

### 1.0 SCOPE

This Product Specification covers the performance requirements of the SAS/PCIe High Speed Serialized Plug connector.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBER(S)

##### Product Name

##### Part Number

SAS/PCIE, RIGHT ANGLE SMT PLUG (30" GOLD)

78758-0001

SAS/PCIE, RIGHT ANGLE SMT PLUG (15" GOLD)

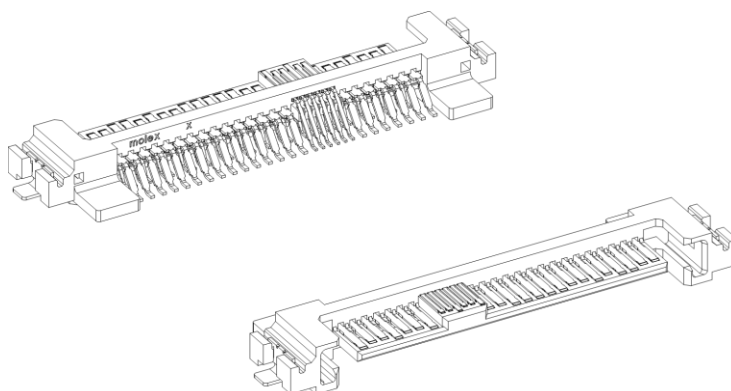
78758-0002

#### 2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See Sales Drawing SD-78758-001 for information on dimensions, materials, platings and markings.

#### 2.3 SAFETY AGENCY APPROVALS

UL FILE : E29179 VOL 10  
CSA : 1699307 (LR 19980)



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DOCUMENT NUMBER: <b>PS-78758-001</b>	CREATED / REVISED BY: <b>Cynthia Wang</b>	CHECKED BY: <b>ML Ong</b>	APPROVED BY: <b>SH Ong</b>



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## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See the Sales Drawing and other sections of this Specification for the necessary referenced Documents and Specifications.

## 4.0 RATINGS

### 4.1 VOLTAGE

30 Volts Max.

### 4.2 CURRENT

Power section (per pin):

- Continuous Current 1.5A
- Peak Current 2.5A 1.5s
- Peak Current Pre-charge 6A 1ms

Signal section (per pin):

- Continuous current 500mA

### 4.3 TEMPERATURE

Operating: 0°C to + 55°C

Non-Operating: -40°C to + 85°C

## 5.0 PERFORMANCE

### 5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Low Level Contact Resistance (LLCR)	Subject mated connectors to a maximum voltage of 20 mV and a current of 100 mA. (EIA 364-23)	30 mΩ MAXIMUM [initial]  Delta Change 15 mΩ MAXIMUM From Initial Value
2	Temperature Rise (via current cycling) (Power Segment, P1 thru P15)	Mount connector to a test PCB with ½ oz copper layer. Wire power pins P1, P2, P8 and P9 in parallel for power. Wire ground pins P4, P5, P6, P10 and P12 in parallel for return. Supply 6A total DC current to the power pins in parallel, returning from the parallel ground pins. Measure and record temperature after 96 hours (45 minutes ON and 15 minutes OFF per hour).	1.5 A per pin MINIMUM  Temperature rise shall not exceed 30°C at any point in the connector when contacts are powered  Still Air at Ambient temperature 25±3°C

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<b>3</b>	<b>Insulation Resistance</b>	After <b>500 VDC</b> for <b>1 minute</b> , measure the insulation resistance between adjacent terminals of the mated and unmated connector assemblies. (EIA 364-21)	<b>1000 Megohms</b> <b>MINIMUM</b>
<b>4</b>	<b>Dielectric Withstanding Voltage</b>	Subject a voltage of <b>500 VAC</b> for <b>1 minute</b> between adjacent terminals of mated and unmated connector at sea level. (EIA 364-20)	No breakdown

## 5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
<b>5</b>	<b>Connector Insertion and Removal Forces</b>	Mate and Unmate connector assemblies at a rate of <b>25 mm</b> per minute. (EIA 364-13)	<b>MAXIMUM Mate force</b> <b>59 N</b>  &  <b>MINIMUM Unmate force</b> <b>5 N for Backplane Receptacle</b>  <i>[At Initial and After Durability]</i>
<b>6</b>	<b>Durability</b>	<b>500</b> cycles for Backplane Receptacle, 25cycles for Cable. All at a maximum rate of <b>200</b> cycles per hour. (EIA 364)	No Physical damage  Delta Change <b>15 mΩ</b> <b>MAXIMUM</b> From Initial Value  Meet requirements of additional tests as specified in the test sequence in Section 7.0
<b>7</b>	<b>Terminal Retention Force</b>	Apply axial pull out force on terminal in the housing at a rate of <b>25.4 mm</b> per minute.	Port 1: 0.7lbf (0.32kgf) MIN retention force Port 2: 0.49lbf (0.22kgf) MIN retention force
<b>8</b>	<b>Resistance to Soldering Heat</b>	Refer to Section 9.0 for Soldering Profile	No Damage in appearance of Connector

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<b>9</b>	<b>Physical Shock</b>	Subject mated connector to <b>50 g's</b> half-sine shock pulses of <b>11 msec</b> duration. Three shocks in each direction applied along three mutually perpendicular planes for a total of <b>18</b> shocks. (EIA 364-27 Condition A)	No Physical damage  Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value  No discontinuities of <b>1 μs</b> or longer duration
<b>10</b>	<b>Random Vibration</b>	Subject mated connector to <b>3.10 g's RMS</b> between 20-500Hz for <b>15</b> minutes in each of the three mutually perpendicular planes. (EIA 364-28 Condition VII Test letter D)	Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value  No discontinuities of <b>1 μs</b> or longer duration

## 5.3 ENVIROMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
<b>11</b>	<b>Humidity</b>	Subject the connector to temperature and humidity of <b>40°C</b> with <b>90%</b> to <b>95%</b> RH for <b>96</b> hours. (EIA 364-31 Method II Test Condition A)	No Physical damage  Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value  Meet requirements of additional tests as specified in the test sequence in
<b>12</b>	<b>Solderability</b>	Solder paste is deposited on a ceramic plate via stencil. The connectors are steam aged and placed onto the solder paste print. The substrate is processed through a forced hot convection oven. The connectors are removed from the ceramic and inspected Steam Aging: 8hr.	No Bridging and 95% solder coating coverage
<b>13</b>	<b>Temperature Life</b>	Subject mated connector to temperature life at <b>+85°C</b> for <b>500</b> hours. (EIA 364-17 Test Condition III Method A)	No Physical damage  Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value  Meet requirements of additional tests as specified in the test sequence in Section 7.0

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14	<b>Thermal Shock</b>	Subject connector to <b>10</b> cycles between <b>-55°C</b> and <b>+85°C</b> . (EIA 364-32 Test Condition I)	<p>No Physical damage</p> <p>Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value</p> <p>Meet requirements of additional tests as specified in the test sequence in Section 7.0</p>
15	<b>Mixed Flowing Gas</b>	1 half of samples are exposed unmated (receptacle only) for 7 days and then mated for additional 7 days. The other half of samples mated for full 14 days test period. (EIA 364-65, Class 2A)	<p>No Physical damage</p> <p>Delta Change <b>15 mΩ</b> MAXIMUM From Initial Value</p> <p>Meet requirements of additional tests as specified in the test sequence in Section 7.</p>

## 6.0 PACKAGING

Refer to Packing Specification, PK-78758-001 (Tape and Reel) for packaging details.

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## 7.0 TEST SEQUENCES

Test Group →	A	B	C	D	E	F	G	H	I	J
Test or Examination ↓										
Examination of the connector(s)	1, 5	1,10	1,7	1,6	1,9	1,10	1	1,7		1
Low Level Contact Resistance (LLCR)	2, 4	2,5,7,9	2,4,6		2,5,7	2,5,7,9				
Insulation Resistance							3,6			
Dielectric Withstanding Voltage							4,7			
Temperature Rise				5						
Insertion Force								2,5		
Removal Force								3,6		
Durability	3	3 <sup>(a)</sup>	3 <sup>(a)</sup>	2 <sup>(a)</sup>	3 <sup>(a)</sup>	3 <sup>(a)</sup>		4		
Physical Shock		8								
Vibration		6								
Humidity					6		5			
Temperature Life		4 <sup>(b)</sup>	5	3		4 <sup>(b)</sup>				
Reseating (manually unplug/plug three times)				4		8				
Thermal Shock					4					
Terminal retention force										2
Resistance to Soldering Heat							2			
Solderability									1	
Mixed Flowing Gas						6				

Note –

- (a) Preconditioning, 50 cycles for the 500-durability cycles requirement. The insertion and removal cycle is at a maximum rate of 200 cycles per hour.
- (b) Preconditioning, 105°C for 72 hours

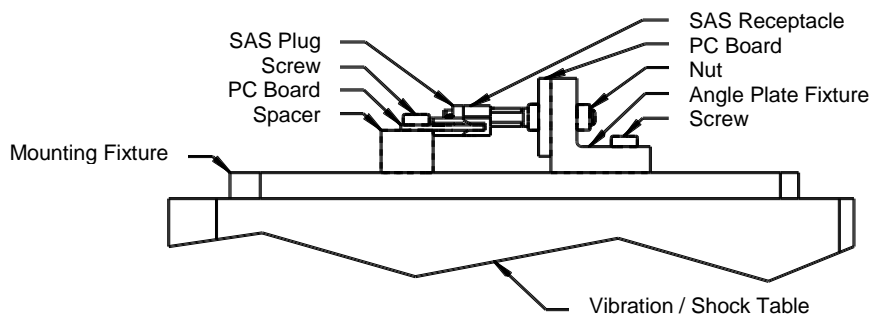
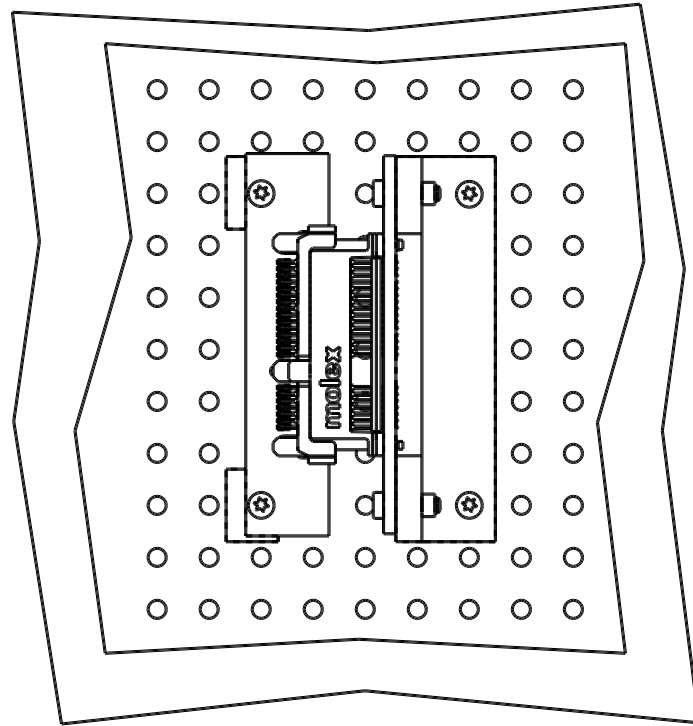
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## 8.0 VIBRATION/SHOCK TEST SET-UP

SAS/PCIe Receptacle mated with SAS/PCIe Plug (For Reference Only)

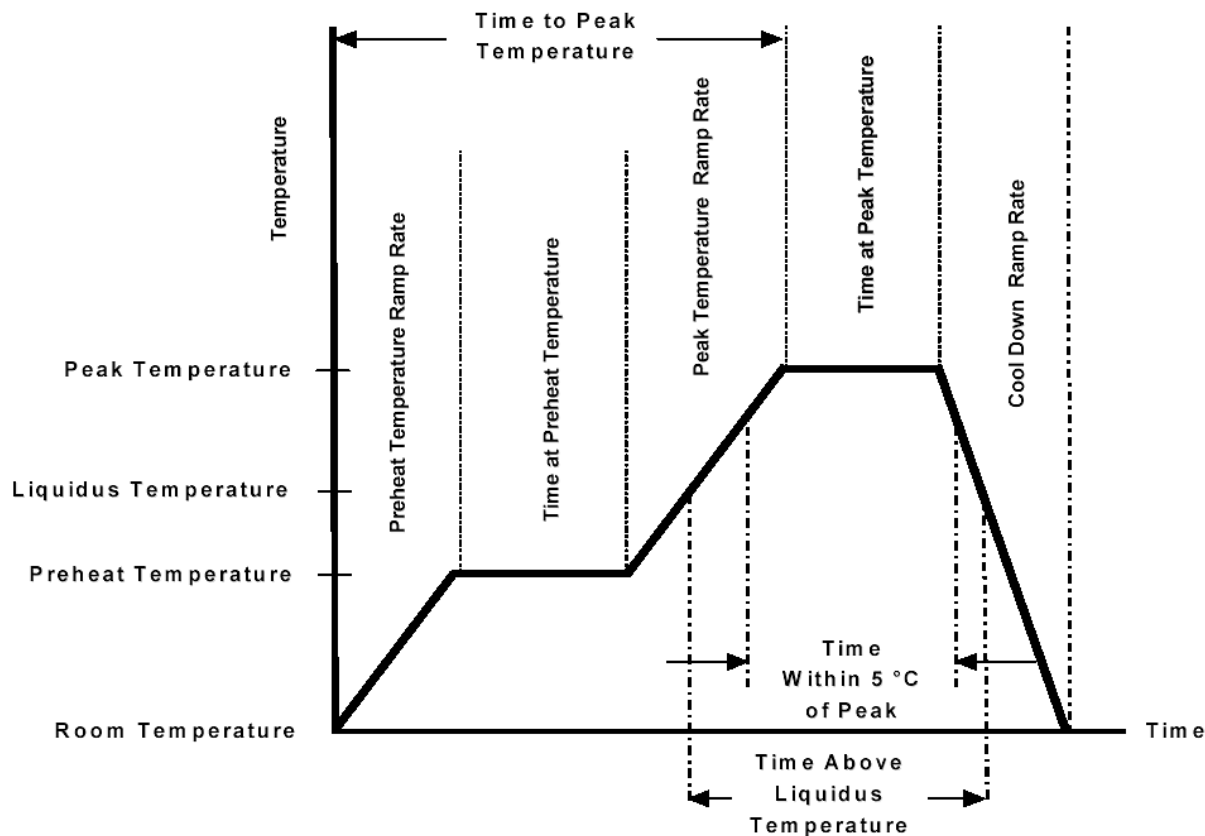


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## 9.0 SOLDERING PROFILE



Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquidus (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

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