



## DDR5 DIMM SMT Memory Socket

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity 288 pin solder tail Connector used primarily in server applications where soldering is acceptable.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

#### 1.3. Qualification Test Results

Qualification testing on the subject product line will be arranged.

### 2. APPLICABLE DOCUMENTS

The following documents from a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

#### 2.1. TE Connectivity Documents

- 109 series: Test Specification as indicated in Figure 1
- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 114-115044: Application Specification

#### 2.2. Industry Standards

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

### 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. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

#### 3.3. Ratings

- Voltage: 30 volts AC
- Current: 1.5 A
- Temperature: -55 to 105°C

#### 3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

#### 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18B. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18B. Visual inspection.
<b>ELECTRICAL</b>		
Low level contact resistance.	Initial: 20mΩ Max. Final: ΔR:20 mΩ Max.	EIA-364-23C. Subject specimens mated with bussed module boards to 100 mA maximum and 20 mV maximum open circuit voltage. Measure all 288 positions. See Figure 3.
Insulation resistance.	1 MΩ minimum.	EIA-364-21E. 500 volts DC, 2 minutes hold. Test between adjacent contacts of mounted specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover. Current leakage: 0.5mA Max.	EIA-364-20, Condition I. 500 volts AC at sea level. Test between adjacent contacts of unmated and mounted specimens.
Current carrying capacity.	30°C maximum temperature rise at specified current.	EIA 364-70 Method 2. 1.5 amp/pin. See Figure 6.



# Product Specification

# 108- 115141

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Test Description	Requirement	Procedure
<b>MECHANICAL</b>		
Reseating.	See Note.	Manually unplug and plug module card, 3 times with latches enabled.
Solderability, lead free	Wet Solder Coverage: 95% Min.	Unmated connector. Steam age for 8 hours +/-15 min. Dip solder tails into solder pot at a temperature of $260 \pm 5^{\circ}\text{C}$ for $5 \pm 0.5$ seconds. Flux type-ROL0 JESD22-B102; Condition C.
Lead Free Process ability	No physical damage shall occur	Test connector on PCB, reflow condition: Comply with JEDEC standard (J-STD-020C). See Figure 5.
Vibration, random.	No discontinuities of $\geq 1$ microsecond electrical, mechanical and environmental criteria	EIA-364 -28 5 Hz @ 0.01 g <sup>2</sup> /Hz to 20 Hz @ 0.02 g <sup>2</sup> /Hz (slope up) 20 Hz to 500 Hz @ 0.02 g <sup>2</sup> /Hz (flat) Input acceleration is 3.13 g RMS 10 minutes per axis for all 3 axes on all samples Random control limit tolerance is $\pm 3$ dB, Detail in Annex A
Mechanical shock.	No electrical discontinuity greater than 1 microsecond during the test. No physical damage.	EIA-364 -27 Trapezoidal shock 50 g, $\pm 10\%$ Duration 11ms Velocity change 170 inch/sec, $\pm 10\%$ Three drops in each of six directions are applied to each of the three PCBs, 5 connectors/PCBs with 7.6mm pitch. Detail in Annex A
Durability.	No nickel plating exposed at contact interface	EIA-364-09 Mate and un mate specimens with 1.37 mm thick steel gauge for 25 cycles at a rate of 25.4mm/minute.
Mating force	106.8 N maximum.	EIA-364-13. Measure force necessary to mate specimens with a 1.37 mm steel gauge at a rate of 25.4 mm per minute
Un mating Force	19.77 N Minimum	EIA-364-13 Axial Tension/Compression machine such as an Instron Tensile Tester. Rate: 12.7 mm/min Use 1.17mm steel gauge
Latch opening force	32.4 N maximum per latch. See Note.	EIA-364-13. Measure force necessary to un mate specimens from a 1.37 mm steel gage at a maximum rate of 5 mm per minute.
Contact retention force	3 N minimum per pin.	EIA-364-29C. Apply specified load to contact tail and hold for 6 seconds.
Tab and Board lock retention	13.3 N minimum per Tab or board lock.	EIA-364-29C Apply specified load to fork lock and hold for 6 seconds.
Connector insertion force into PCB (board lock)	35 N maximum	EIA-364-05. Press socket into PCB board at a rate of 12.7 mm per minute.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	EIA-364-32, Method A, Table 2, Test Condition I. -55 and 85C, perform 5 cycles in mated condition.
Cyclic Temperature & Humidity.	See Note.	EIA-364-31B, Method III. Subject mated and mounted specimens. initial measurements, cold shock and vibration. 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 specified levels, perform 24 cycles in mated condition.
Thermal cycling	See Note.	Subject mated and mounted specimens to 100 cycles between $15 \pm 3^{\circ}\text{C}$ and $85 \pm 3^{\circ}\text{C}$ as measured on the specimen). Ramps times shall be a minimum of $2^{\circ}\text{C}$ per minute. Dwell times shall ensure that the contacts reach the temperature extreme (5 minutes minimum). Humidity not controlled.
Temperature life	See Note	EIA-364-17, Method A, Test Condition 4 (without electrical load). Subject mated and mounted specimens to $105^{\circ}\text{C}$ for 120 hours.
Temperature life (preconditioning)	See Note	Subject mated and mounted specimens to $105^{\circ}\text{C}$ for 72 hours (pre-condition).
Mixed flowing gas	See Note	EIA-364-65, class IIA, Option 4. Expose all specimens in the mated condition for the total mixed flowing gas exposure duration per EIA 364-1000 Table 4. 30u" Au version (field life 7 years): Five specimens mated for 240 hours. 15u" Au version (field life 5 years): Five specimens mated for 168 hours.



Test Description	Requirement	Procedure
Thermal disturbance	See Note	Subject mated and mounted specimens to 10 cycles between 15±3°C and 85±3°C as measured on the part. Ramps shall be a minimum of 2°C per minute. Dwell times shall ensure that the contacts reach the temperature extreme (5 minutes minimum). Humidity not controlled. perform 10 cycles in mated condition.
<b>Connector Latch Reliability</b>		
Latch Reliability	See Note	Detail in Annex B

**NOTE**

*Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

**Figure 1 (end)**

### 3.6 Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Test Sequence (b)												
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1	1	1
Low level contact resistance	2,5,7	2,7,9,13	2,4,6,8	2,5,7,9,11	2,5,7,9								2,6
Insulation resistance		3,10											
Withstanding voltage		4,11											
Current carrying capacity							2						
Reseating	6	12		10	8								5
Solderability						2							
Lead Free Process ability													2
Vibration, random			5										
Mechanical shock			7										
Durability	3(c)	5(c)	3(c)	3(c)	3(c)	3							3(c)
Mating force								2					
Un mating force									3				
Latch opening force								3					
Contact retention										3			
Fork lock retention										2			
Connector insertion force into PCB									2				
Thermal shock		6			4								
Cyclic temperature & humidity		8			6								
Thermal cycling													4
Temperature life	4			4(d)									
Mixed flowing gas				6									
Thermal disturbance				8									
Latch Reliability											2		
Final examination of product	8	14	9	12	10	4	3	4	4	4	3	7	3

**NOTE**

- a) See paragraph 4.1.A.
- b) Numbers indicate sequence in which tests are performed.
- c) Durability preconditioning with only 5 cycles.
- d) Temperature life preconditioning, 72 hours duration.
- e) Measure contact gaps across mating interface.

**Figure 2**



## Annex A

- **A.1 Test Module - weight and center of gravity**
  - Module 1 weight  $53 \pm 2$  grams and module 2 weight  $40 \pm 2$  grams.
  - Module 1 and module 2 are staggered placed, no same module next to each other.
  - Center of gravity of module: 18-20 mm from the module mating edge (bottom of the module where gold fingers reside).
  - Module thickness:  $1.27 \pm 0.10$  mm. • Module to check continuity.
- **A.2 Test Conditions**
  - Trapezoidal shock  $50 \text{ g} \pm 10\%$ .
  - Velocity change 170 inch/sec,  $\pm 10\%$ .
  - Three drops in each of six directions are applied to each of the three samples.
  - **3 Test Conditions Random profile:**
    - 5 Hz @ 0.01  $\text{g}^2/\text{Hz}$  to 20 Hz @ 0.02  $\text{g}^2/\text{Hz}$  (slope up)
    - 20 Hz to 500 Hz @ 0.02  $\text{g}^2/\text{Hz}$  (flat)
    - Input acceleration is 3.13 g RMS
    - 10 minutes per axis for all 3 axes on all samples
    - Random control limit tolerance is  $\pm 3 \text{ d}$

## Annex B (Connector Latch Reliability)

### Test Procedure

- B1: Place the module near the tested connector, align the module edge to the connector tower and the module key to the connector key
- B2: Apply force on left corner of module top edge to lock the left side Latch, then press the module to close the right-side latch. Check to make sure the module installation is completed. The unbalanced installation applies to the worst case operation.
- B3: Apply force on left latch to pop up the module, then press the right latch to uninstall the module. The unbalanced uninstallation applies to the worst case operation.
- B4: Repeat step 2 to step 4 with the same module for 25 cycles, at minimum rate of 20 second/cycle
- B5: Examine the left latch for any failure mode.
- B6: Repeat the step 1 to step 6 for additional three test samples, using a new module for each new test sample.
- B7: Check the right-side Latch for four new test samples, with similar procedures from step 1 to step 6.

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

- A. Specimen Selection  
Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. All test groups shall each consist of 5 specimens.
- B. Test Sequence  
Qualification inspection shall be verified by testing specimens as specified in Figure 2.

### 4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

### 4.3. Acceptance

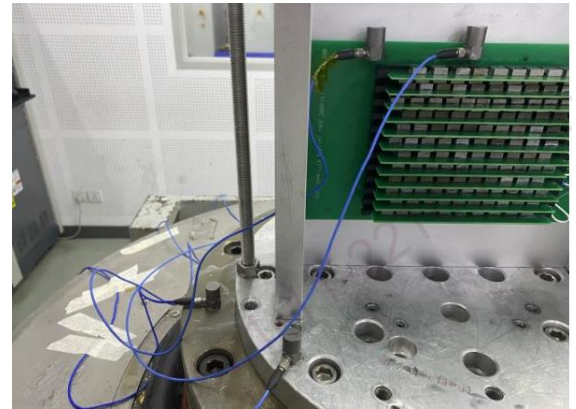
Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken, and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

### 4.4. Quality Conformance Inspection

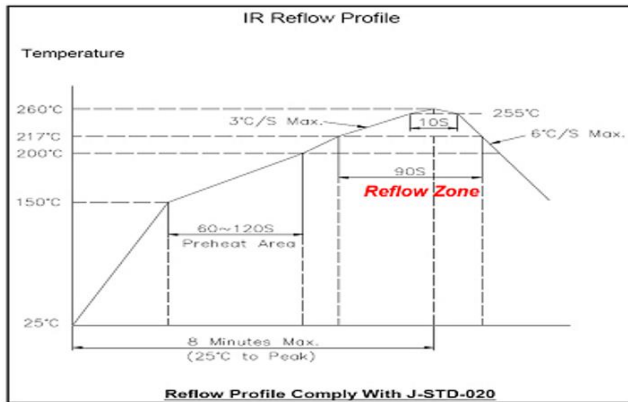
The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.



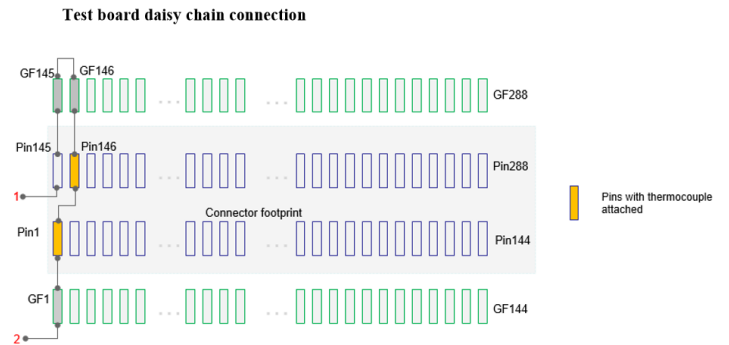
**Figure 3**  
Low Level Contact Resistance



**Figure**  
Vibration and Mechanical Shock



**Figure 5**  
Reflow Temperature Profile



**Figure6**  
Test board daisy chain connection