DDR4 DIMM Through-hole 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 desktop and 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 form 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-*****: 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: 25 volts AC
- Current: 0.75 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-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance.	10 milliohms maximum initial. ΔR 10 milliohms maximum.	EIA-364-23. Subject specimens mated with bussed module boards to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Measure all 288 positions. See Figure 3.
Insulation resistance.	1 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mounted specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	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. Connect 6 consecutive contacts on 1 side of specimen in series and load with 0.75 ampere. Place a thermocouple through a small hole in the housing as close to the contact as possible.

Figure 1 (continued)

Test Description	Requirement	Procedure
	MECHANICAL	
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 hour +/-15 min. Dip solder tails into solder pot at a temperature of 245±5℃ for 5±0.5 seconds. Flux type-ROL0 JESD 22-B-102; Condition C.
Resistance to Solder Heat	Visual: No damage or discoloration of connector materials.	EIA-364-56 Dip solder tails into solder pot of 260 ±5℃for 5±1 seconds. Immerse leads to a depth of 1.00± 0.2mm from connector body.
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28. Module thickness:1.40 mm Module weight 65 ± 5 g Duration: 10 minutes per axis for all 3 axes on all samples. Frequency range: 5 to 500 Hz. 5 to 20 Hz (slope): (0.01 g^2/Hz) at 5 Hz; (0.02 g^2/Hz) at 20 Hz; 20 to 500 Hz (flat): (0.02 g^2/Hz) at 20 Hz. Input acceleration is 3.13 g RMS; Random control limit tolerance: ± 3 dB. See Figure 4.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27. Module thickness:1.40 mm Module weight 65 ± 5 g Profile: Trapezoidal shock of 50 g ± 10%. Velocity change: 170 inches/sec ± 10%. Quantity: Three drops in each of 6 directions are applied to each of the three samples. See Figure 4.
Durability.	Rating of 25 cycles as determined by EIA-TS-364-1000.1 See Note.	EIA-364-9. Mate and unmate specimens with 1.50 mm thick steel gauge for 25 cycles at a maximum rate of 500 cycles per hour.

Figure 1 (continued)

Test Description	Requirement	Procedure
	MECHANICAL	
Mating force	106.8 N maximum.	EIA-364-05. Measure force necessary to mate specimens with a 1.50 mm steel gauge at a maximum rate of 5 mm per minute See Figure 5.
Unmating force (per pin pair)	14 gf min.	EIA-364-13 Axial Tension/Compression machine such as an Instron Tensile Tester. Rate: 12.7 mm/min GS-005 Gauge
Contact backout wipe	No discontinuities of 1 microsecond or longer duration	Fully seat daisy chain module. Pull module upward until stopped by latches while monitoring for discontinuities.
Latch opening force.	32.4 N maximum per latch. See Note.	EIA-364-13. Measure force necessary to unmate specimens from a 1.50 mm steel gage at a maximum rate of 5 mm per minute. See Figure 5.
Contact retention.	3 N minimum per pin. No movement of contact more than 0.38 mm	EIA-364-29. Apply specified load to contact tail and hold for 6 seconds.
Fork lock retention (where applicable).	13.3 N minimum per fork lock. Maximum movement of 0.38 mm	EIA-364-29 Apply specified load to fork lock and hold for 6 seconds.
Connector insertion force into PCB	75 N maximum.	Press socket onto board at a rate of 5 mm per minute.

Figure 1 (continued)

Test Description	Requirement	Procedure
	ENVIRONMENTAL	
Thermal shock.	See Note.	EIA-364-32, Method A, Table 2,Test Condition I. -55 and 85℃, perform 5 cycles in mated condition.
Cyclic Temperature & Humidity.	See Note.	EIA-364-31B, Method III. Subject mated and mounted specimens to 10 cycles between 25℃ at 80% RH and 65℃ at 50% RH. Ramp times shall be 0.5 hour with 1 hour dwell time.
Thermal cycling	See Note.	Subject mated and mounted specimens to 500 cycles between 15±3℃ and 85 ±3℃ as measured on the specimen). Ramps times shall be a minimum of 2℃ 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. Subject mated and mounted specimens to 105℃ for 240 hours.
Mixed flowing gas	See Note	EIA-364-65, Class IIA. 30u" Au version (field life 7 years): Five specimens unmated for 160 hours, mated for 80 hours. Five specimens mated for 240 hours. Store module cards at laboratory ambient during the unmated portion of the exposure. 15u" Au version (field life 5 years): Five specimens unmated for 112 hours, mated for 56 hours. Five specimens mated for 168 hours. Store module cards at laboratory ambient during the unmated portion of the exposure.
Thermal disturbance	See Note	Subject mated and mounted specimens to 10 cycles between 15±3℃ and 85± 3℃ as measured on the part. Ramps shall be a minimum of 2℃ per minute. Dwell times shall ensure that the contacts reach the temperature extreme (5 minutes minimum). Humidity not controlled.

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
	Test Sequence (b)										
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1
Low level contact resistance	2,6,8	2,7,9,13	2,4,6,8,10	2,5,7,9,11						2,5,7,9	
Insulation resistance		3,10									
Withstanding voltage		4,11									
Current carrying capacity									2		
Reseating	7	12		10						8	
Solderability						2					
Resistance to Solder Heat											2
Vibration, random			7								
Mechanical shock			9								
Durability	4(c)	5(c)	3(c)	3(c)						3(c)	
Mating force					2						
Unmating force per pin pair								3			
Latch opening force					3						
Contact retention							3				
Fork lock retention							2				
Connector insertion force into PCB								2			
Contact backout wipe	3										
Thermal shock		6									
Cyclic temperature & humidity		8									
Thermal cycling										6	
Temperature life	5		5(d)	4(d)						4(d)	
Mixed flowing gas				6							
Thermal disturbance				8							
Final examination of product	9	14	11	12	4	3	4	4	3	10	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, 120 hours duration.
(e) Measure contact gaps across mating interface.

Figure 2

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.

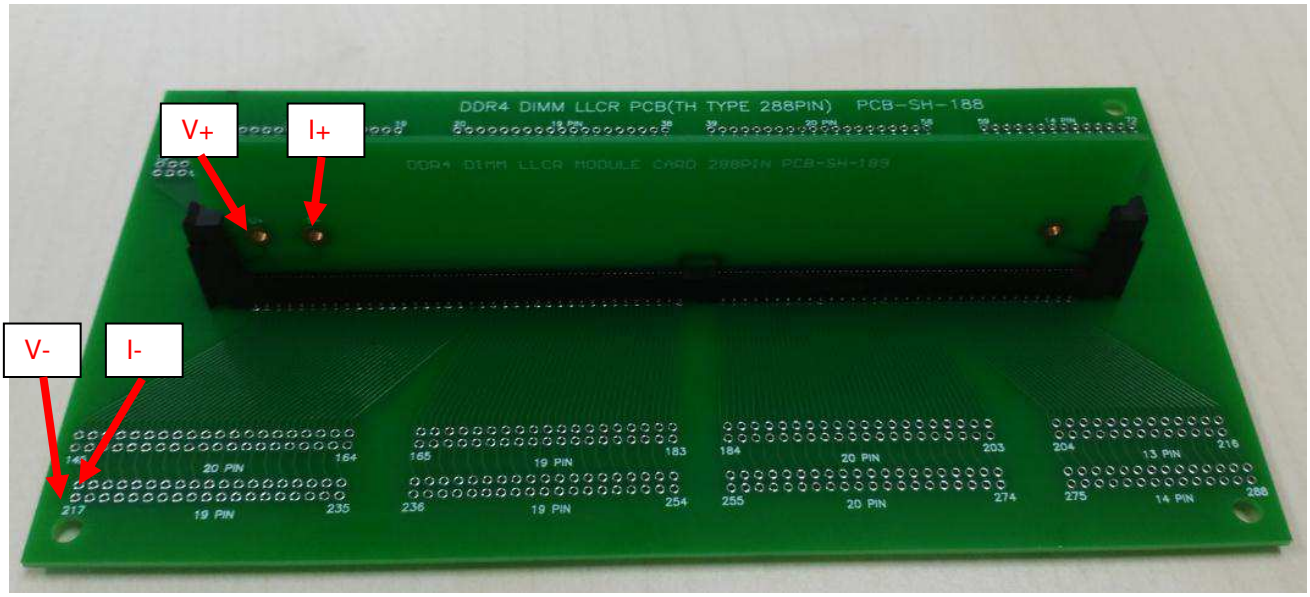

Figure 3

Low Level Contact Resistance

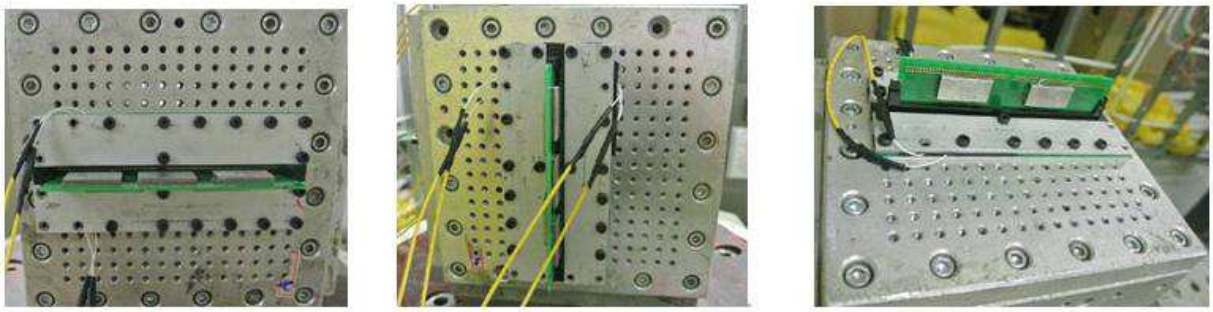

Figure 4
Vibration and Mechanical Shock