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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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**DDR2 Press-Fit Tail DIMM Socket**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Double Data Rate 2 (DDR2) Press-Fit Tail Dual In-line Memory Module (DIMM) socket used to connect modules to mother boards.

## 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

Successful qualification testing on the subject product line was completed on 12Nov04. The Qualification Test Report number for this testing is 501-592. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**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. Tyco Electronics Documents

- 109 Series: Test Specifications as indicated in Figure 1
- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 114-13094: Application Specification
- 501-592: Qualification Test Report

## 2.2. Commercial Standards

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EIA-364-1000.01: Environmental Test Methodology for Assessing the Performance of Electrical Connectors and Sockets Used in Business Office Applications

**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: Signal application only
- 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 per EIA-364.

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.
CTF dimensional verification.	See Figure 3.	Measure specimens.
<b>ELECTRICAL</b>		
Low level contact resistance.	30 milliohms maximum initial. $\Delta R \pm 20$ milliohms maximum.	EIA-364-23. Subject specimens mated with bussed module boards to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 4.
Insulation resistance.	1 megohm minimum.	EIA-364-21. Test between adjacent contacts of unmated specimens.
Withstanding voltage.	1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 500 volts AC at sea level. Test between adjacent contacts of unmated specimens.
Current carrying capacity.	Less than 30°C temperature rise.	EIA 364-70. Connect 10 consecutive contacts on 1 side of the specimen in series and load with 0.5 ampere. Place a thermocouple through a small hole in the housing as close to the contacts as possible.
<b>MECHANICAL</b>		
Reseating.	See Note.	Manually unplug and plug module card 3 times.

Figure 1 (cont)

Test Description	Requirement	Procedure
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28. Module weight shall be 35 ± 5 g [1.23 ± .18 oz] with the center of gravity located 20 to 25 mm [.787 to .984 in] from the module mating edge. Subject 5 continuity and termination resistance specimens to 3.13 G's rms between 5-500 Hz, 10 minutes per axis (PSD 0.01 G <sup>2</sup> /Hz at 5 Hz, and 0.02 G <sup>2</sup> /Hz at 20 and 500 Hz). See Figure 5
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27. Module weight shall be 35 ± 5 g [1.23 ± .18 oz] with the center of gravity located 20 to 25 mm [.787 to .984 in] from the module mating edge. Subject 5 continuity and termination resistance specimens to 50 G's trapezoidal shock pulses of 11 milliseconds duration. 3 shocks in each of 3 mutually perpendicular planes, 18 total shocks. 4.83 m [190 in] per second velocity change nominal, 4.32 m [170 in] per second minimum. 1 ms rise and fall times, 9 ms peak duration. See Figure 5.
Durability.	Rating of 25 cycles as determined by EIA-TS-364-1000.1 See Note.	EIA-364-9. Mate and unmate specimens for 20 cycles at a maximum rate of 500 cycles per hour. Use the same module card for the 1 <sup>st</sup> and 20 <sup>th</sup> cycles and subsequent tests. Use a separate module card for the 2 <sup>nd</sup> through 19 <sup>th</sup> cycles.
Mating force.	Total force less than 155.7 N [35.003 lbf] with latches at maximum module thickness (1.37 +0/-0.05 mm [.054 +0/-0.002 in]). See Note.	EIA-364-05. Measure force necessary to mate specimens with a 1.37 mm [.054 in] steel gage at a maximum rate of 5 mm [.2 in] per minute without preconditioning. See Figure 6.
Unmating force.	38.25 N [8.599 lbf] maximum per ejector. See Note.	EIA-364-13. Measure force necessary to unmate specimens from a 1.37 mm [.054 in] steel gage at a maximum rate of 5 mm [.2 in] per minute. See Figure 6.

Figure 1 (cont)

Test Description	Requirement	Procedure
Unmating force per pin pair.	0.14 N [14 gf] minimum average.	EIA-364-13. With both latches removed, measure force necessary to unmate specimens from a standard 1.27 mm [.050 in] thick module card at a maximum rate of 5 mm [.2 in] per minute. See Figure 6.
Contact retention.	Less than 0.381 mm [.015 in] movement with 2.94 N [.661 lbf] load per contact.	EIA-364-29. Apply specified load to pull tail at a rate of 2.54 mm [.1 in] per minute and hold for 6 seconds.
Plating thickness.	30 µin minimum gold at contact point.	EIA-364-48, Method C.
Maximum force on connector.	Less than 0.076 mm [.003 in] movement.	Apply 68.1 kg [150 lb] to the top of a 1.37 mm [.054 in] steel gage after the gage has been fully seated and is bottomed out. Maintain force for 30 seconds. See Figure 6.
Contact backout wipe.	No discontinuity.	Fully seat daisy chain module. Pull module upward until stopped by latches while monitoring for discontinuities.
Press-fit compliant pin/terminal insertion.	31 N [7 lbf] maximum per pin average.	AMP Spec 109-41 Measure force necessary to correctly apply a connector assembly to a printed circuit board at a maximum rate of 12.7 mm [.5 in] per minute.
Press-fit compliant pin/terminal retention.	13.7 N [3 lbf] minimum. See Note.	AMP Spec 109-30 Apply specified load to a single pin for 6 seconds in a correctly applied connector assembly from its printed circuit board hole at a maximum rate of 12.7 mm [.5 in] per minute.

ENVIRONMENTAL

Solvent resistance.	See Note.	EIA 364-11.
Thermal shock.	See Note.	EIA-364-32, Test Condition I. Subject specimens to 10 cycles between -55 and 85°C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 24 cycles (3 days) between 25°C at 80% RH and 65°C at 50% RH. Ramp times shall be .5 hour and dwell times 1 hour.

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105°C for 240 hours.
Thermal disturbance.	See Note.	Subject mated specimens to 10 cycles between 15 ± 3°C and 85 ± 3°C. 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 is not controlled.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). Three specimens unmated for 5 days, mated for 5 days. Three specimens mated for 10 days. Store module cards at ambient during unmated exposure.
Porosity.	Maximum of 1 pore 0.051 mm [.002 in] maximum diameter per 10 random contacts per specimen.	EIA-364-53. Nitric acid.

**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	9	10	
	Test Sequence (b)									
Initial examination of product	1	1	1	1	1	1	1	1	1	1
CTF dimensional verification	2	2	2					2		
Low level contact resistance	3,7,9	3,8,10,14	3,5,7,9	2,5,7,9,11						
Insulation resistance		4,11								
Withstanding voltage		5,12								
Current carrying capacity									3	
Mutual inductance between adjacent signals (L12)										
Coupling capacitance between adjacent signals (C12)										
Reseating	8	13		10						
Vibration, random			6							
Mechanical shock			8							
Durability	5(c)	6(c)	4	3(c)						
Mating force					2					
Unmating force					3					
Unmating force per pin pair										3
Contact retention							2			
Plating thickness						2				
Maximum force on connector					4					
Contact backout wipe	4									
Press-fit compliant pin/terminal insertion										2
Press-fit compliant pin/terminal retention										4
Solvent resistance							3			
Thermal shock		7								
Humidity-temperature cycling		9								
Temperature life	6			4(d)						
Thermal disturbance				8						
Mixed flowing gas				6						
Porosity						3				
Final examination of product	10	15	10	12	5	4	4	4	4	5

- NOTE** (a) See paragraph 4.1.A.  
 (b) Numbers indicate sequence in which tests are performed.  
 (c) Durability preconditioning only 5 cycles required same card, all cycles.  
 (d) Temperature life preconditioning only 120 hours.

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. Test groups 1, 2, 3, 5, 6, 9 and 10 shall each consist of 5 specimens. Test group 4 shall each consist of 6 specimens. Test group 7 shall consist of 4 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.



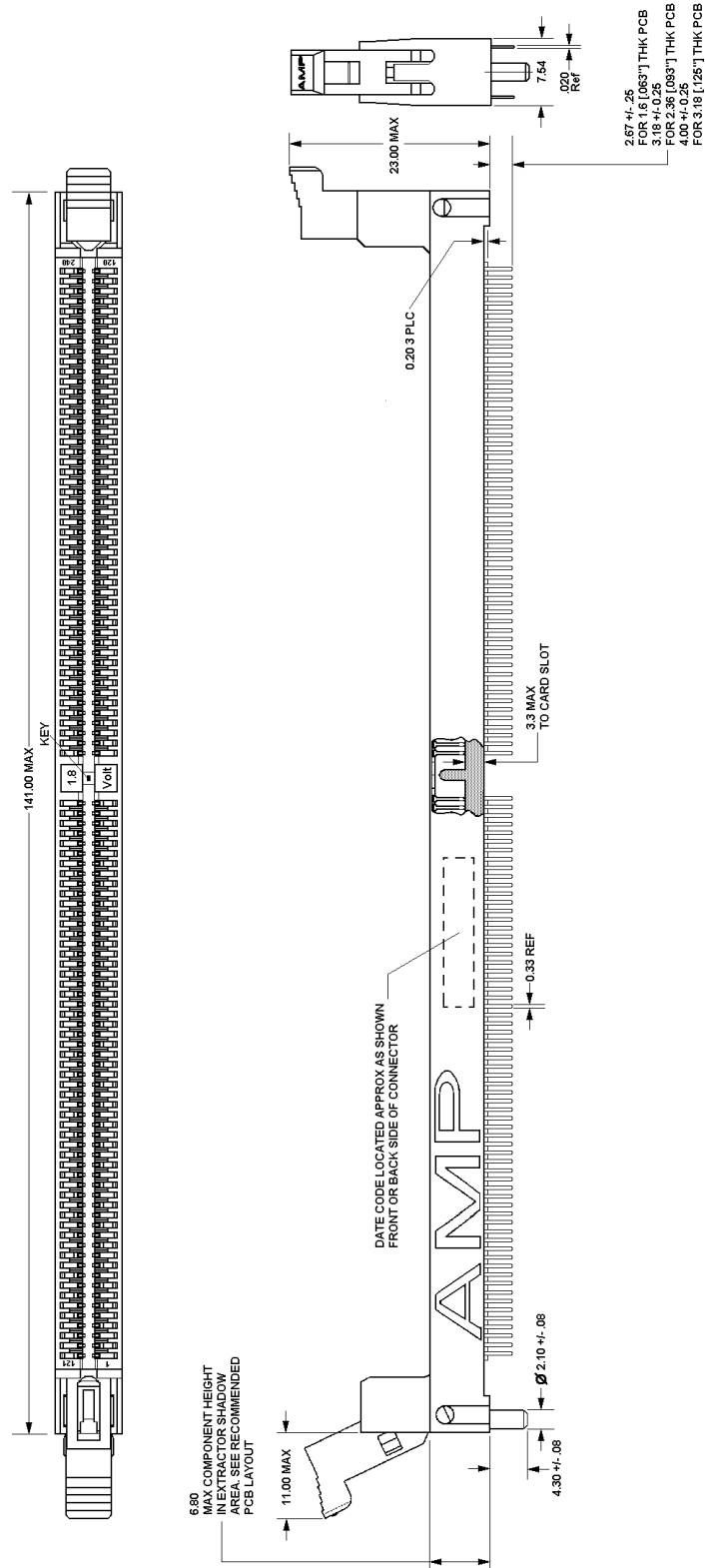


Figure 3  
CTF Dimensional Verification

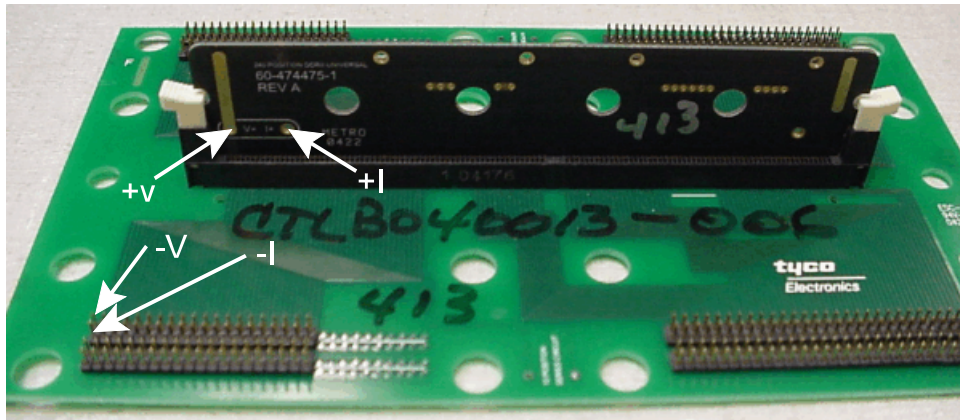


Figure 4  
Low Level Contact Resistance Measurement Points

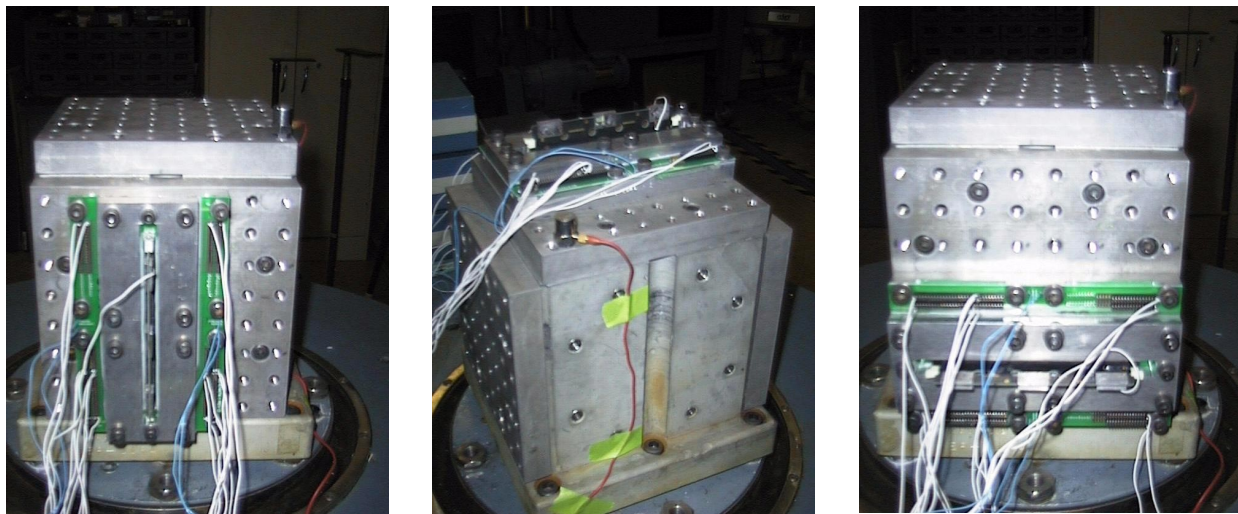


Figure 5  
Vibration and Mechanical Shock Fixturing

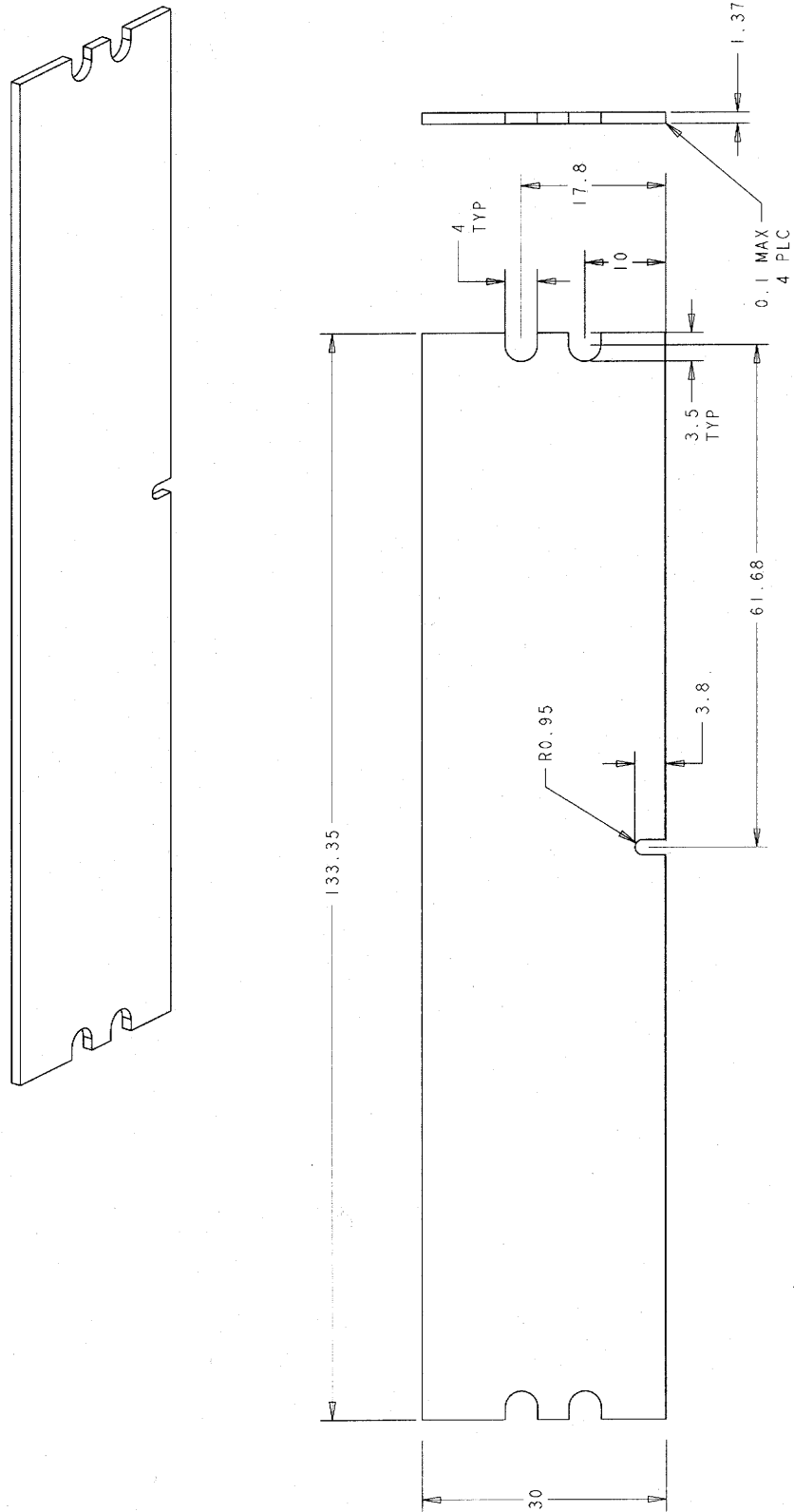


Figure 6  
Steel Gage