240 Position, 25 Degree DDR II DIMM Assembly

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics 240 Position, 25 Degree DDR II DIMM Assembly.

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 11Nov04. The Qualification Test Report number for this testing is 501-591. 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

- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 501-591: Qualification Test Report

2.2. Industry Standard

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.

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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.
ELECTRICAL		
Low level contact resistance.	30 milliohms maximum initial. ΔR 20 milliohms maximum.	EIA-364-23. Termination of connector to base board and add-in card shall be included in measurements. See Figure 3.
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, 0.5 ampere per pin.	EIA 364-70. Ten consecutive positions on the same side of the connector are connected in a series circuit (mated condition). A thermocouple is inserted though a hole in the socket housing, as close to the contact interface as possible.
MECHANICAL		
Reseating.	See Note.	Manually unplug and plug module card 3 times.

Figure 1 (cont)

Test Description	Requirement	Procedure
Solderability, tin-lead.	95% coverage.	EIA 364-52, Class 1, Category 3.
Solderability, lead free.	95% coverage. No physical damage. Contact gap within supplier manufacturing tolerance.	EIA 364-52, Class 1, Category 3. One, 30 second exposure at 190˚C oven. Processing criteria: solder 260 ± 5˚C for 5 seconds.
Vibration, random.	See Note.	EIA-364-28. Module weight 35 ± 5g with the center of gravity of 20 to 25 mm from the module mating edge. Duration: 10 minutes per axis for all 3 axes on all samples. Frequency Range: 5 to 500 Hz. 5 to 20Hz (slope): ($0.01g^2$/Hz) at 5 Hz, ($0.02g^2$/Hz) at 20 Hz; 20 to 500Hz (flat): ($0.02g^2$/Hz) at 20 Hz; Input acceleration is 3.13 g RMS; Random control limit tolerance: ± 3 dB. See Figure 4.
Mechanical shock.	See Note.	EIA-364-27. Module weight 35 ± 5g with the center of gravity of 20 to 25 mm from the module mating edge. Profile: Trapezoidal shock of 50 g ± 10% Duration: 10 ms Minimum Velocity change: 170 inches/sec, ± 10%. Quantity: Three drops in each of six directions, applied to three sample boards. 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 for 20 cycles at a maximum rate of 500 cycles per hour. Use the same board for the 1st and 20th cycles and subsequent tests. Use a separate board for the 2nd through the 19th cycles.

Figure 1 (cont)

Test Description	Requirement	Procedure
Mating force.	< 155.7 N [35 lbf].	EIA-364-05. Measure force necessary to mate specimens with a steel gage at a maximum rate of 5 mm [.2 in] per minute. Use the maximum module thickness (1.37 +0/-0.05 mm). Machined dummy modules are acceptable; all edge radii's .005 inch maximum. See Figure 5.
Unmating force.	38.25 N [8.6 lbf] maximum per ejector. See Note.	EIA-364-13. Measure force necessary to unmate specimens from a steel gage at a maximum rate of 5 mm [.2 in] per minute. See Figure 5.
Unmating force per pin pair.	0.14 N [14 gf] minimum.	EIA-364-13. With both latches removed, measure force necessary to unmate specimens from a nominal (1.27 mm) module card at a maximum rate of 5 mm [.2 in] per minute.
Retention force, terminal to housing.	300 gf minimum per pin, no movement of contact more than 0.38 mm [.015 in].	EIA-364-29.
Fork lock retention (where applicable).	13.3 N [2.99 lbf] minimum per fork lock. Maximum movement of 0.38 mm [.015 in].	EIA-364-29.
Connector insertion force into PCB.	< 50.7 N [11.4 lbf] per fork lock.	Press socket onto board at a rate of 5 mm [.2 in] per minute. Measure force at nominal fork lock hole diameter 2.45 + .05 mm.
Contact backout wipe.	No discontinuity.	Fully seat daisy chain module. Pull module upward until stopped by latches while monitoring for discontinuities.
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.

Figure 1 (cont)

Test Description	Requirement	Procedure
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 with 1 hour dwell time.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4. Subject mated specimens to 105˚C for 240 hours. See Figure 2.
Mixed flowing gas.	See Note.	EIA-364-65, Class IIA (4 gas). 3 specimens unmated for 5 days, mated for 5 days. 3 specimens mated for 10 days.
Thermal disturbance.	See Note.	Subject mated 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.

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	2,5,7,9,11							
Insulation resistance		3,10									
Withstanding voltage		4,11									
Current carrying capacity								2			
Reseating	7	12		10							
Solderability (per plating type)						2					
Vibration, random			5								
Mechanical shock			7								
Durability	4(c)	5(c)	3	3(c)							
Mating force					2						
Unmating force					3						
Unmating force per pin pair									2		
Retention force, terminal to housing							3				
Fork lock retention							2				
Connector insertion into PCB										2	
Contact backout wipe	3										
Solvent resistance											2
Thermal shock		6									
Humidity-temperature cycling		8									
Temperature life	5			4(d)							
Mixed flowing gas				6							
Thermal disturbance				8							
Final examination of product	9	14	9	12	4	3	4	3	3	3	3

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, 120 hour duration.

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, 5, 6, 7, 8, 9 and 10 shall each consist of 5 specimens. Test groups 3 and 4 shall each consist of 6 specimens. Test group 11 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.

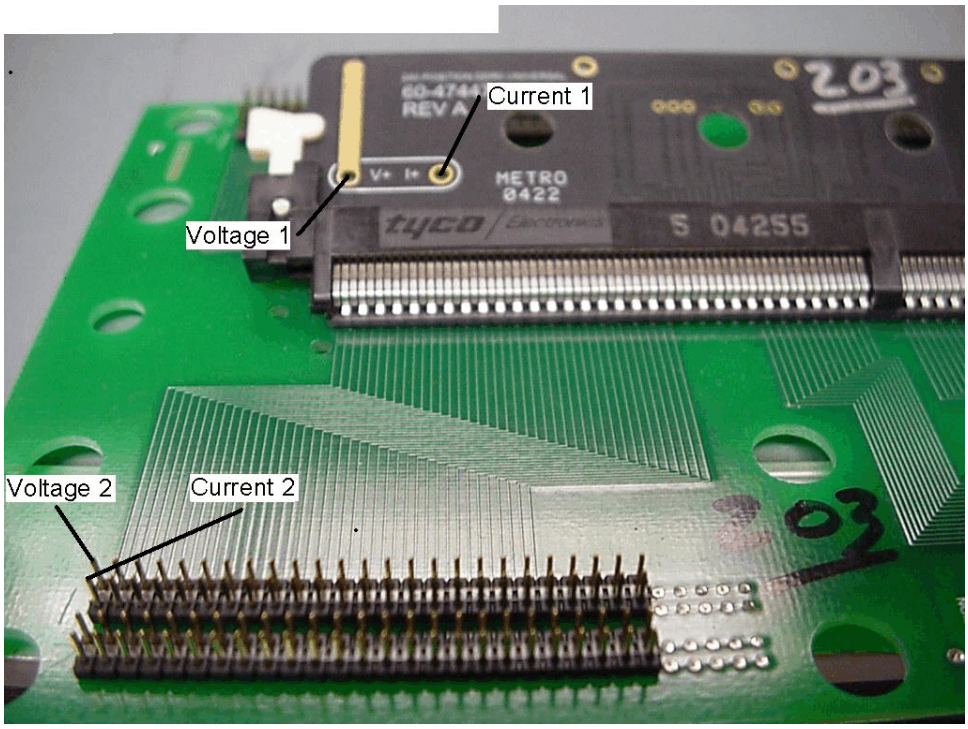
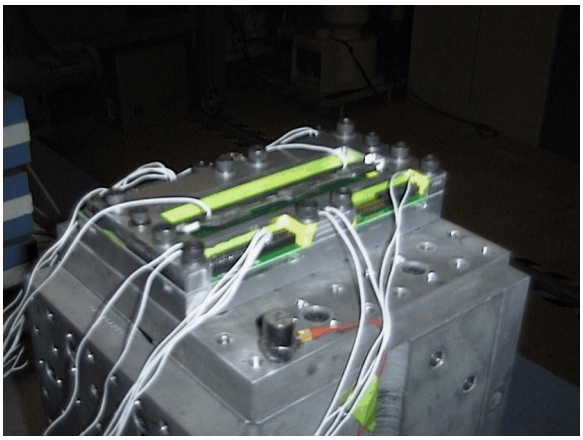
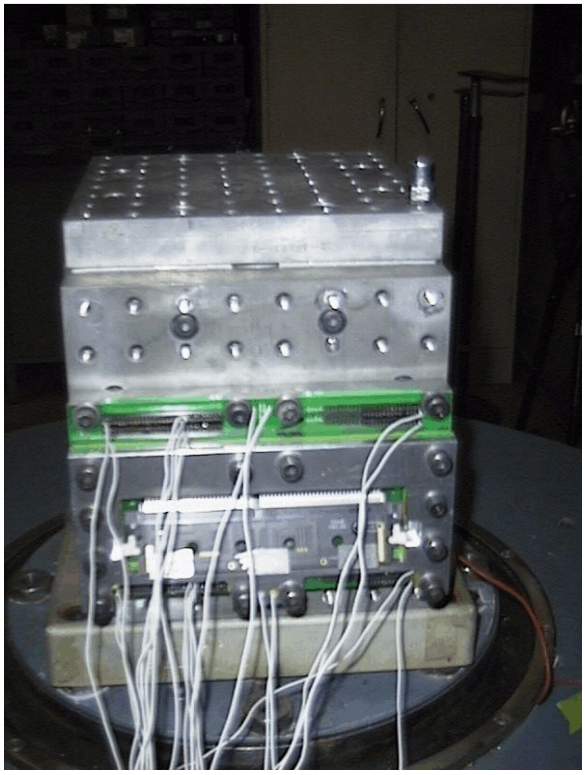


Figure 3
Low Level Contact Resistance Measurement Points





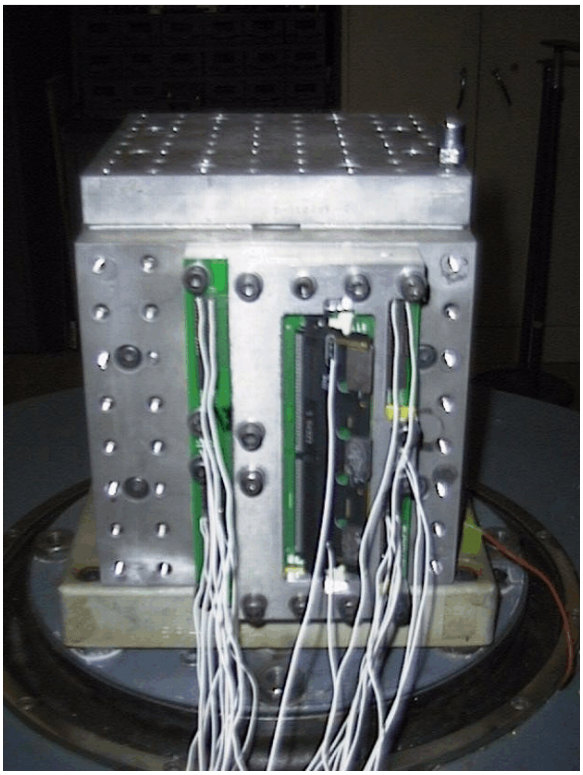


Figure 4
Vibration and Mechanical Shock Fixturing

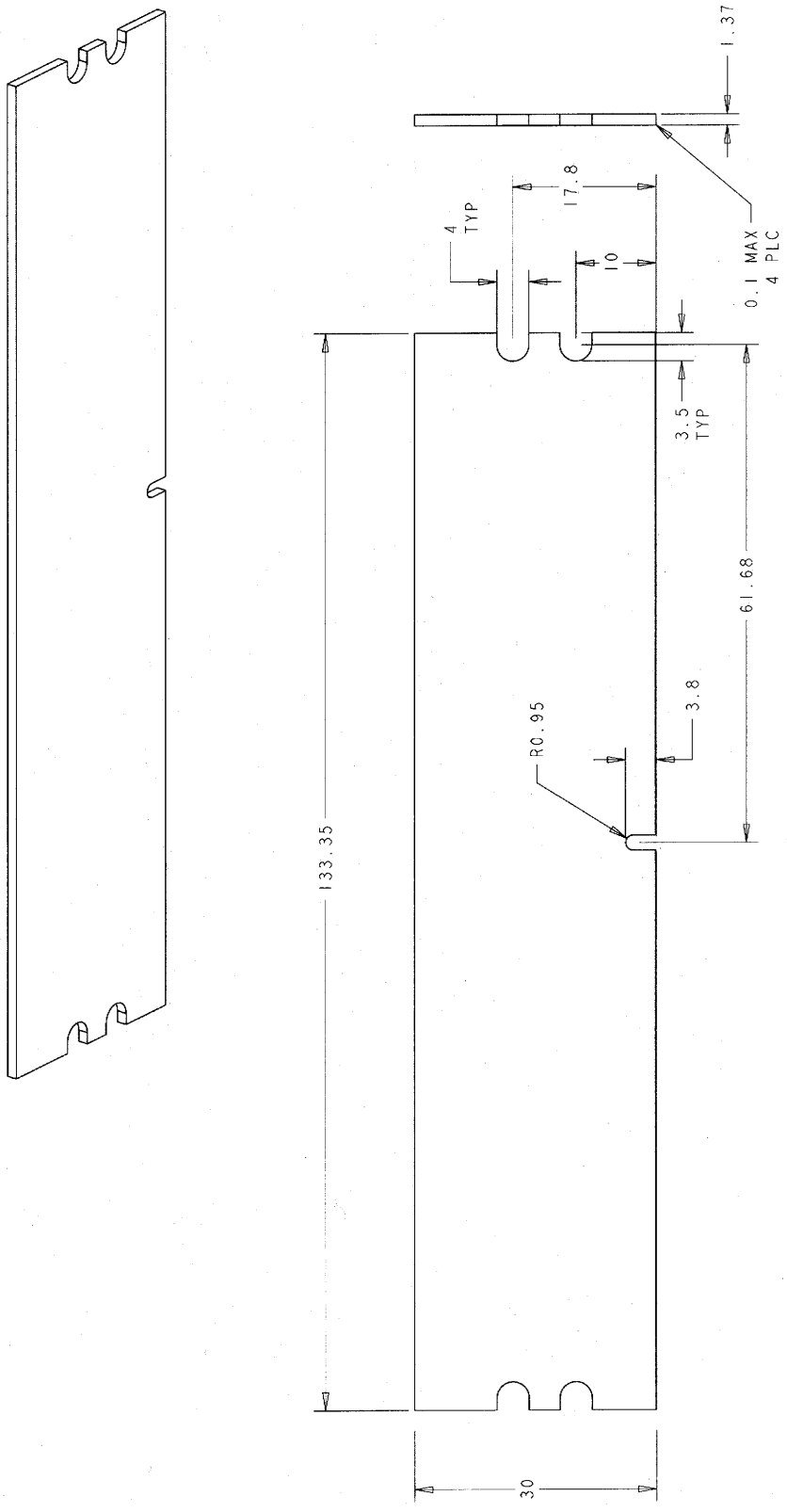


Figure 5
Steel Gage