

**1. SCOPE**

## 1.1. Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of LGA1366 / LGA1356 socket.

## 1.2. Qualification Test Results

The Qualification Test Report number for this testing is 501-5870. This documentation is available from StarTEC.

**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 specifications

- A. 109-5000: Test specification, general requirements for test methods
- B. 109-197: AMP test specification vs EIA and IEC test methods
- C. 411-78289: Instruction sheet
- D. 114-5432: Application specification
- E. 501-5870: Test report (LGA1366 / LGA1356 socket)

## 2.2. Commercial standards and specifications

- A. MIL-STD-202 Test method for electronic and electric parts.
- B. EIA-364: Electrical connector / socket test Procedures including environmental classifications.

### 3. REQUIREMENTS

#### 3.1. Design and material construction

The design, material construction and dimensions are specified on the applicable product drawings.

#### 3.2. Ratings

##### A. Temperature rating:

Continuous: 0 to 85 °C

Operating: -25 to 100°C

#### 3.3. Performance requirements and test descriptions

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 1.

All tests shall be performed in the room temperature, unless otherwise specified.

## 3.5. Test Requirements and Procedures Summary

Test Items	Requirements	Procedures
Initial examination of product	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing. No physical damage
Final examination of product	Meets visual requirements.	EIA-364-18. Visual inspection.
Electrical Requirements		
Termination resistance (Low level)	Maximum chain resistance (8~18pos. chain average) : 28m $\Omega$ Max. *1 (Socket average resistance ) :15.2m $\Omega$ Max. *1	EIA-364-23. Subject specimens to 10 mA maximum and 20 mV maximum open circuit voltage.
Dielectric withstanding voltage	No creeping discharge nor flashover shall occur. Current leakage: 0.5mA Max	360 Vrms for 1 minute. Test between adjacent contacts of unmated specimens.
Insulation resistance	800M $\Omega$ Min	EIA-364-21. Impressed voltage 500VDC. Test between adjacent contacts of unmated specimens
Package mating operation force of lever	49N (5kgf) Max	Measure the vertical force required to lock the lever by loading at the tip of lever.
Package unmating operation force of lever	49N (5kgf) Max	Measure the lateral force required to unlock the lever by loading at the tip of lever.
Durability (Repeated mate unmating)	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Operation rate: 8cycle/min No. of cycles: 30cycles.

Figure 1 (Continue)

Vibration (Random)	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Test Package mated socket with ILM assy and 133N (13.6kgf) compressive load from heat sink Vibration frequency: 10 to 2000Hz (Random) Accelerated velocity: 30.38 m/s <sup>2</sup> (3.1 G),rms, Vibration direction: In each of 3 mutually perpendicular planes Duration: 15 minute each EIA-364-28 test condition VII , Condition D
Physical shock	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Test Package mated socket with ILM assy and 133N (13.6kgf) compressive load from heat sink Accelerated velocity: 490 m/s <sup>2</sup> (50 G) Waveform: Halfsine Duration: 11 m sec. Number of drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops.
<b>Environmental Requirement</b>		
Temperature Humidity	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Test Package mated socket with ILM assy and 0~294N (0~30kgf) compressive load from heat sink 85 °C, 85 % R.H. 1000 hours
Temperature life (Heat aging)	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Test Package mated socket with ILM assy and 0~294N (0~30kgf) compressive load from heat sink 125 °C, / 1500 hours AMP Spec. 109-5104-2 Condition A EIA-364-17 table 8
Thermal cycling (TC-Q)	28m $\Omega$ Max. (Maximum chain) (Final) *1 15.2m $\Omega$ Max. (Socket average) (Final) *1	Test Package mated socket with ILM assy and 0~294N (0~30kgf) compressive load from heat sink -25 °C / 15 min., +100 °C / 15 min. / cycle, 1500 cycles

Figure 1 (continue)

Resistance to reflow soldering heat	Tested housing shall show no evidence of deformation or fusion of housing and no physical damage.	Test socket on PCB. (Lead Free, Sn-Ag-Cu solder ball) Solder ball part Pre-Heat 150~170 °C : 90 sec Min. Heat 217 °C Min. : 40 ~100sec Heat Peak : 245±5 °C Other than solder ball Heat Peak : 260 °C max.
Mixed flowing gas	See Note (a). EIA-364-65,	Class IIA (4 gas). Subject specimens to environmental Class IIA for a total of 10 days. For the first 5 days, 1/2 of the specimens shall be mated, the other half unmated. For the second 5 days, all specimens shall be mated.

\*1 Bulk resistances of test CPU and test P.C.B. are subtracted

Figure 1 (end)

## 3.6. Product Qualification Test Sequence

Test examination / Test sequence	Test Group							
	1	2	3	4	5	6	7	8
Test sequence (a)								
Examination of product	1	1	1	1	1	1	1	1
Termination resistance (Low Level)	2,4,6	2,4	2,4		2,4	2,4,6,8		2,4
Dielectric withstanding voltage				2,5,8				
Insulation resistance				3,6,9				
Vibration (Low frequency)	5							
Physical shock	3							
Package mating operation force of lever							2	
Package unmating operation force of lever							3	
Durability (Repeated mate/unmating)			3 (c)			3(d)		
Temperature humidity		3(e)		7				
Temperature life (Heat aging)					3(f)			
Thermal cycling				4				3(h)
Mix flowing Gas						5,7(g)		
Solder ball shear force							4	
Porosity							5	
Resistance to reflow soldering heat							6	

**NOTE**

- (a) Numbers indicate sequence in which the tests are performed.
- (c) Durability 30X
- (d) Durability 5X
- (e) Perform termination resistance every 250 hours (until 1000 hours).
- (f) Perform termination resistance every 250 hours (until 1500 hours).
- (g) Perform termination resistance after 5 and 10 days of mixed flowing gas exposure.
- (h) Perform termination resistance every 250 cycles (until 1500 cycles)

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**
**4.1. Qualification Testing**
**A. Test Sequence**

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

**4.2. 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.

**4.3. 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.

Product drawing NO.	Description
1981837	LGA1366 Socket
1554116	LGA1356 Socket
1939738	ILM Assembly
1939739	Stiffener plate assy A (Desk top back plate)
1981467	Stiffener plate assy B (Server back plate)

Rev.	Rev. Record	Prepared		Check		Approval	
A	RELEASE	Y.S	18 <sup>th</sup> Aug 2008	Y.S	18 <sup>th</sup> Aug 2008	S.H	18 <sup>th</sup> Aug 2008
B	REVISED	N.H	17 <sup>th</sup> Mar 2010	Y.S	17 <sup>th</sup> Mar 2010	S.H	17 <sup>th</sup> Mar 2010
C	REVISED	T.S	19 <sup>th</sup> Nov 2010	Y.S	19 <sup>th</sup> Nov 2010	T.N	19 <sup>th</sup> Nov 2010