

Product Specification

108-60035

Battery 4P SMT 1.6mm Pitch Assembly Connector

1. SCOPE.

1.1 Content.

This specification covers performance, test and quality requirements for a special Tyco 4 pos. 1.6mm pitch battery connector. The connector is designed to make a connection between the battery cells of a battery-pack and the system printed circuit board thru an intermediate PC-board in a battery-pack. The contracting-end to the battery is of the spring-type, while the connection to the system PC-board is of the surface-mount soldering-type, representing 1 solder-joint. An opposite symmetrical located single solder-strip (hold down) assures a stable mechanical connection to the PC-board.

1.2 Qualification.

When tests are performed on subject product, procedures specified in this Design Objective Specification shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS.

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

DIST	A1	D20050715042553_573755	I.W.	15JUL05	DR Ivanov Wang Mar.10'05		<div><div>tyco</div><div>Electronics</div></div> <div>Tyco Electronics AMP Shanghai Ltd.</div>				
					CHK Steven Yao Mar.10'05						
					APP Ikuo Enomoto Mar.10'05		DOC NO. 108-60035		REV A1	LOC ES	
					PAGE 1 of 8		TITLE Battery 4P SMT 1.6mm Pitch Assembly Connector				
	A	D20050405034410_612033	I.W.	10MAR05							
	LTR	REVISION RECORD	DR	DATE							

2.1 AMP Documents.

A. 109-5000 Test Specification, General Requirements for Test Methods

B. 501-5629 Qualification Test Report Battery 4P SMT 1.6mm Pitch Assembly Connector

2.2 AMP Drawings.

C-292331 Battery 4P SMT 1.6mm Pitch Assembly Connector

2.3 Other Documents.

IEC 512 Connectors used for frequencies below 3MHz (Mc/s).

IEC 68 Basic environmental testing procedures for electric components and electronic equipment.

EIA 481-1 Packaging standard for EIA pocket-tape.

3. REQUIREMENTS.

3.1 Design and Construction.

Products shall be of design, construction and physical dimensions as specified on the applicable product drawing.

3.2 Material and Finish.

A. Contacts: Copper alloy, post-plated with selective gold at contact area, gold-flash on soldering-end.

B. Solderstrip: Brass, tin-plated over nickel.

C. Housing: Liquid Crystal Polymer (LCP).

3.3 Ratings.

A. Voltage: 250 VAC.

B. Current: 2 Amperes.

C. Temperature: -40°C to +85°C.

3.4 Performance and Test description:

The product is designed to meet electrical, mechanical and environmental performance specified in this paragraph as tested per test sequence specified in para. 3.6.

Unless otherwise specified, all tests are performed at ambient environmental conditions per IEC specification 68-1 clause 5.3. and are performed with connectors in mated conditions.

tyco Electronics	Tyco Electronics AMP Shanghai Ltd.	PAGE 2 of 8	Document No. 108-60035	REV A1	LOC ES
----------------------------	---	-----------------------	---------------------------	-----------	-----------

VISUAL			
Para.	Test Description	Performance Requirements or Severity	Procedures
3.4.1.	Examination of product	Meets requirements of product drawing.	Visual dimensional and functional per applicable inspection plan. In acc. With IEC 512-2 test 1a. Magnification 10X.
ELECTRICAL			
Para.	Test Description	Performance Requirements or Severity	Procedures
3.4.2.	Termination resistance “See para. 3.5.1.”	Max. open voltage 20mV. Max. current 100mA. All contacts measured. Terminal resistance consists of bulk-connector + contact-resistance. Requirements: 15mΩ Max. (initial), ΔR 15mΩ Max.	In acc. With IEC 512-2 test 2a.
3.4.3.	Insulation resistance	Test voltage: 100V DC, unmated. Duration: 1 minute. Requirement: 1000MΩ Min.	In acc. With IEC 512-2 test 3a, method C.
3.4.4.	Voltage proof	Test voltage: 1000V AC, unmated. Duration: 1 minute. Requirement: No break-down or flash-over.	In acc. With IEC 512-2 test 4a, method C.
3.4.5.	Temperature-rise versus current	Test current: 2A, Temp.Rise 30°C Max.	In acc. With IEC 512-3 test 5b.

(To be continued)

tyco Electronics	Tyco Electronics AMP Shanghai Ltd.	PAGE 3 of 8	Document No. 108-60035	REV A1	LOC ES
----------------------------	---	------------------------	-----------------------------------	-------------------	-------------------

MECHANICAL			
Para.	Test Description	Performance Requirements or Severity	Procedures
3.4.6.	Contact normal force “See para. 3.5.2.”	Normal force shall be measured at 0.15mm distance from housing top. Requirement: 0.8N Min.	See figure 2.
3.4.7.	Contact retention in housing	Requirements: 3N Min.	In acc. with IEC 512-8 test 15b.
3.4.8.	Vibration “See para. 3.5.3.”	5-150Hz, acceleration 1.5g, 1 oct./min. 1 hour in each direction Requirements: No physical damage. No discontinuity > 1μsec.	In acc. with IEC 68-2-6 test fc.
3.4.9.	Mechanical operation “See para. 3.5.3.”	10000 mating cycles. Check after each 1000 cycles. Visual, termination resistance.	In acc. with IEC 512-5 test 9a.
3.4.10.	Physical shock “See para. 3.5.3.”	250g half sine-wave pulse of 11ms, 6 directions (+X, -X, +Y, -Y, +Z, -Z), 3 shocks each direction.	In acc. with IEC 512-4 test 6c.
ENVIRONMENTAL			
Para.	Test Description	Performance Requirements or Severity	Procedures
3.4.11.	Damp/heat cycling	25/55°C, 12/12 hours. 93% RH, 6 cycles (unmated in test-group 3)	In acc. with IEC 68-2-30 test dp.
3.4.12.	Heat age test	Temp. 85°C. Duration: 500 hours.	In acc. with IEC 68-2-2 test ba.

(To be continued)

tyco Electronics	Tyco Electronics AMP Shanghai Ltd.	PAGE 4 of 8	Document No. 108-60035	REV A1	LOC ES
----------------------------	---	------------------------	-----------------------------------	-------------------	-------------------

Para.	Test Description	Performance Requirements or Severity	Procedures
3.4.13.	Solderability	Solder bath temp.: $235\pm 3^{\circ}\text{C}$. Dip duration: $5\pm 0.3\text{sec}$. Solderable area shall be have a solder coverage of 95% Min.	In acc. with MIL-STD-202, method 208.
3.4.14.	Resistance to soldering-heat “See para. 3.5.4.”	Requirement: No cracks, chips or melting.	2 cycles of IR-soldering heat-curve specified in figure 4.
3.4.15.	Rapid change of temperature	$-40/+85^{\circ}\text{C}$, 2/2 hours, 5 cycles, mated. Change-over time < 3 min.	In acc. with IEC 68-2-14 test nb.
3.4.16.	Salt spray	2 spraying cycles at $35\pm 2^{\circ}\text{C}$, each 2 hours $5\pm 1\%$ salt solution with pH6.5-7.2. Storage: 7 days at $40\pm 2^{\circ}\text{C}$, 93% RH after each cycles.	In acc. with IEC 68-2-52 test kb.

(End)

3.5 Additional testing details.

3.5.1 Termination resistance shall be measured as indicated in figure 1.

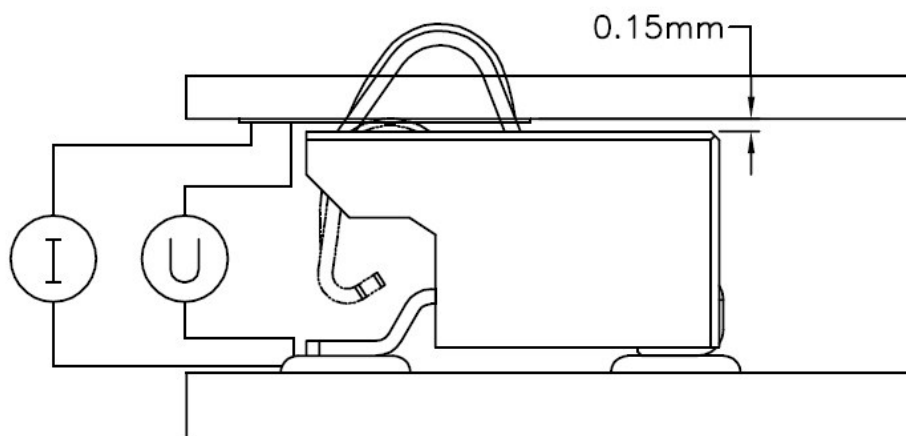


Figure 1

tyco Electronics	Tyco Electronics AMP Shanghai Ltd.	PAGE 5 of 8	Document No. 108-60035	REV A1	LOC ES
----------------------------	---	------------------------	-----------------------------------	-------------------	-------------------

3.5.2 Contact normal force shall be measured with point of action as indicated in figure 2.

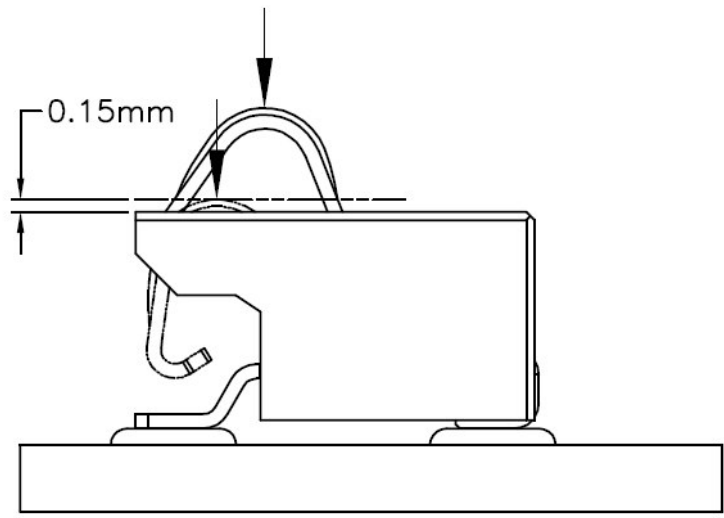


Figure 2

3.5.3 Test-frames for Mechanical Operation, Vibration and Physical Shock tests shall simulate the actual application. For configuration details see figure 3.
If applicable the actual phone hand-set shall be used for optimum simulation.

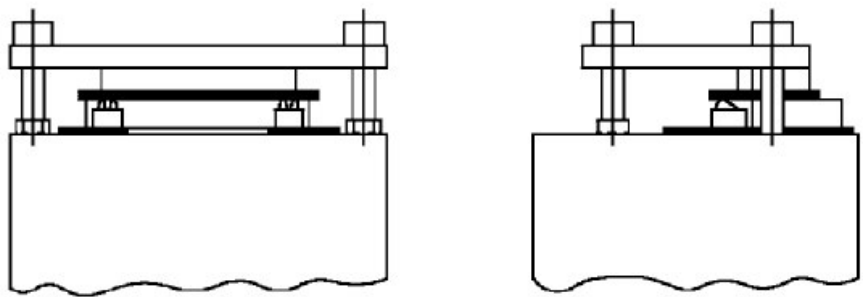


Figure 3

3.5.4 Resistance to soldering-heat test shall cover the IR-soldering heat-curve as indicated in figure 4.

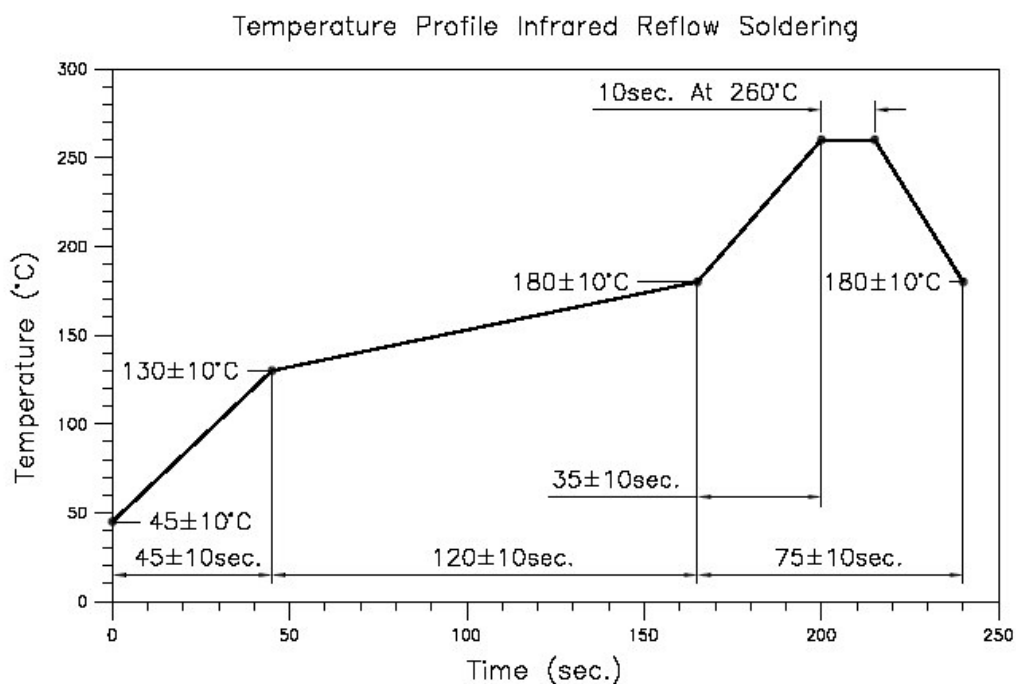


Figure 4

3.6 Product Qualification and Requalification Test Sequence.

Test or examination	Test-Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Examination of product	1,3,10	1	1,8	1,3	1,5	1,5	1,5
Termination resistance	4,8				2,4	2,4	2,4
Insulation resistance			2,6				
Voltage proof			3,7				
Temperature-rise versus current							3
Contact normal force		2					
Contact retention in housing		3					
Vibration	6						
Mechanical operation						3	
Physical shock	5						
Damp/heat cycling	7		5				
Heat age test					3		
Solderability				2			
Resistance to soldering-heat	2						
Rapid change of temperature			4				
Salt spray	9						

(a) See para. 4.1.

(b) Numbers indicate sequence in which tests are performed.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification testing.

4.1.1 Sample selection

Samples shall be prepared in accordance with applicable instructions and shall be selected random from current production.

With exception of test-group 5 and 7 connectors in each test-group shall be IR-reflow soldered to a PC-board enduring the IR heat-curve twice and shall be mounted in test-frame or pocket-phone cases according to the actual application.

4.1.2 Test sequence

Qualification inspection shall be verified by testing samples as specified in para. 3.6.

4.2 Requalification testing.

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

4.3 Acceptance.

Acceptance is based upon verification that product meets requirements of para. 3.4. Failures attributed to equipment, test set-up or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for requalification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality conformance inspection.

Applicable AMP quality inspection plan will specified sampling acceptable quality level to be used.

Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.

tyco Electronics	Tyco Electronics AMP Shanghai Ltd.	PAGE 8 of 8	Document No. 108-60035	REV A1	LOC ES
----------------------------	---	------------------------	-----------------------------------	-------------------	-------------------