Socket 939 / 940 / M2 connector

1. Scope:

This specification covers performance, tests, and quality requirements for Socket 939 / 940 / M2 (940) Leaded & Lead free connector.

2. Applicable document

The following documents form a part of this specification to the extent specified herein. 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.

Test report: 501-5612

3. Requirements

3.1. Design and construction

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

3.2. Materials

A. Housing: Thermoplastic, UL 94V-0
B. Cover: Thermoplastic, UL 94V-0
C. Contact: Copper alloy with gold over nickel plating at contact area
D. Ball: Tin/Lead for Leaded. Tin/Sliver/Copper for Lead free.
E. Lever: Stainless steel
F. Cap : Thermoplastic, UL 94V-0

3.3. Ratings

A. Current rating: 1.5A maximum per individual contact
B. Voltage rating: 125 Vac.
C. Operating temperature: -55℃ to 110℃

3.4. Test condition

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test requirement and procedures summary

Test description	Requirement	Procedure
Examination of product	Meets requirements of product drawing, and specification.	EIA-364-18 Visual and dimensional inspection and function per applicable quality plans.

ELECTRICAL		
Low level contact resistance. (LLCR)	20 mΩ maximum.	EIA-364-23 20mV, 100mA max
Insulation resistance.	1000 MΩ minimum.	EIA 364-21 Apply 100V(DC) for 1 minutes.
Dielectric withstanding voltage	No creeping discharge or flashover occurred.	EIA -364-20 Condition I Apply 650V(AC) between adjacent contacts.

MACHANICAL		
Durability	See Note(a).	EIA-364-09 Free and lock sample for 50 cycles using dummy CPU.
Socket Retention Force	122.5 N (min) (12.5 kgf minimum)	Measure force necessary to pull out the dummy CPU at mated condition at rate of 12.5 mm/min.
Pin Retention Force	1N (102gf) (min)	Measure force to pull out terminals at a speed rate of 12.5 mm/min.
Solder Ball Shear Force	6N (612g) (min)	Measure force to shear off solder balls at a speed rate of 12.5mm/min.
Lever Actuation and De-actuation Force	35.3N (max) (3.6Kgf maximum)	Measure the actuation and de-actuation force while locking and unlocking the package.
Mechanical Shock	No discontinuities longer than 1 microsecond.	EIA-364-27 Subject mated samples with 900g Heat-sink to 50G's half-sine shock wave of 11ms duration.3 shocks in each direction applied along 3 mutually perpendicular plans,18 total shocks.
Vibration, random	No discontinuities longer than 1 microsecond.	EIA-364-28 Subject mated samples to 3.10G's between 20~500Hz.15 minutes in each 3 mutually perpendicular planes, with 100mA current applied.

Figure 1 (continue)

ENVIRONMENTAL		
Thermal Shock	See Note(a).	EIA-364-32 Mated samples to 10 cycles between -55℃/30minutes~110℃/30minutes.
Humidity-temperature Cycling	See Note(a).	EIA-364-31 Mated samples to 25℃~85℃ with 90%~95% RH. Test for 1000 hours.
Temperature Life	See Note(a).	EIA-364-17 Mated samples to 115℃ for 432 hours.
Salt Spray	See Note(a).	EIA-364-26 Mated samples to 35℃ with 5% salt spray for 48 hours.
Thermal Cycling	See Note(a).	EIA-364-32 Mated samples to 150 cycles between -40℃/30minutes~125℃/30minutes.
Pin Current Rating	ΔT=30℃(max)	EIA-364-70 155 contacts must be series, and apply specified current to the circuit, use thermocouples to measure the temperature rise.
Resistance to Soldering Heat	No Damage	EIA-364-56 Subject unmated samples to 260℃ +/- 5℃ for 30 seconds.

Figure 1(end)

Note(a): Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the product qualification and re-qualification test sequence shown in figure 2.

3.6. Product qualification and re-qualification test sequence

Test or examination	Test group (a)						
	A	B	C	D	E	F	G
	Test sequence (b)						
Visual Inspection	1,9	1,5	1,10	1,6	1,6	1,9	1,7
Low Level Contact Resistance	3,5,7	2,4		2,4	2,5	2,4,6,8	
Insulation Resistance			2,5,8				
Dielectric Withstanding Voltage			3,6,9				
Vibration	6						
Mechanical Shock	4						
Durability					3(c)	3(d)	
Thermal Shock			4			5	
Humidity-Temp. Cycling			7			7	
Temperature Life				3			
Salt Spray					4		
Thermal Cycling		3					
Preconditioning Thermal Aging	2						
Socket Retention				5			
Contact Normal Force							3
Pin Retention Force							5
Solder Ball Shear Force							4
Lever Actuation and De-actuation Force							2
Pin Current Rating	8						
Resistance to Soldering Heat							6

Figure 2

NOTE :

(a) Sample shall be prepared in accordance with applicable Instruction sheets and shall be selected at random from current production.

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

(c) Lock and unlock socket with proper package for 50 cycles durability.

(d) Lock and unlock socket with proper package for 5 cycles durability.

4. The applicable product descriptions and part numbers are as shown in Appendix 1

Product part NO.	Type	Description	Reference
1827496-1, -3	Leaded	ZIF 939P mPGA SMT Ball Type, 15U"	908040-202
1827496-2, -4	Leaded	ZIF 939P mPGA SMT Ball Type, G/F	908040-201
1-1827496-1, -3	Lead free	ZIF 939P mPGA SMT LF Ball Type, 15U"	908040-204
1-1827496-2, -4	Lead free	ZIF 939P mPGA SMT LF Ball Type, G/F	908040-203
1871593-1, -3	Leaded	ZIF 940P mPGA SMT Ball Type, 15U"	908046-102
1871593-2, -4	Leaded	ZIF 940P mPGA SMT Ball Type, G/F	908046-101
1-1871593-1, -3	Lead free	ZIF 940P mPGA SMT LF Ball Type, 15U"	908046-104
1-1871593-2, -4	Lead free	ZIF 940P mPGA SMT LF Ball Type, G/F	908046-103
1903485-1	Lead free	ZIF M2 mPGA SMT LF Ball Type, 15U" (940)	90-G835-702AZ
1903485-2	Lead free	ZIF M2 mPGA SMT LF Ball Type, G/F (940)	90-G835-701AZ

Appendix 1

LTR	REV. RECORD	PREPARED		CHECK		APPROVAL	
O	RELEASED	S.ABE	18JAN'05	S.HASHIMOTO	18JAN'05	H.SHIRAI	18JAN'05
A	REVISED	S.ABE	22DEC'05	S.HASHIMOTO	22DEC'05	H.SHIRAI	22DEC'05