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**Miniature Spring Sockets**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for Tyco Electronics Miniature Spring Sockets designed to provide an electrical and mechanical connection with solid wire leads typically encountered on electrical and electronic components. Various sizes of sockets accommodate wire diameters ranging from .010 to .065.

## 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 24Apr1990. The Qualification Test Report number for this testing is 501-127. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

The following Tyco Electronics 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.

- ! 109-1: General Requirements for Test Specifications
- ! 109 Series: Test Specifications as indicated in Figure 1
- ! 501-127: Qualification Test Report (Miniature Spring Sockets)

**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. Material

- ! Contact: Copper alloy base, nickel underplate all over with gold, gold flash over palladium-nickel, or tin plated per applicable product drawing.
- ! Eyelet: Copper or copper alloy, gold or tin plated per applicable product drawing.

3.3. Ratings

- ! Current: 30°C maximum temperature rise, alternating or direct current
  - Series 1: 3.0 amperes
  - Series 2: 4.0 amperes
  - Series 3: 5.0 amperes
  - Series 4: 6.5 amperes
  - Series 5: 7.5 amperes
- ! Temperature: -65 to 125°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 are performed at ambient environmental conditions per Test Specification 109-1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Termination resistance, specified current.	15 milliohms maximum.	AMP Spec 109-25. Measure potential drop of socket with wires inserted at 1 ampere DC. Calculate resistance. See Figure 3.
Termination resistance, dry circuit.	15 milliohms maximum.	AMP Spec 109-6-1. Subject sockets with wires inserted to 50 millivolts open circuit at 100 milliamperes maximum. See Figure 3.
Temperature rise vs current.	30°C maximum temperature rise at current specified in paragraph 3.3.A.	AMP Spec 109-45-1. Subject sockets with wires inserted to temperature rise. See Figure 3.
<b>MECHANICAL</b>		
Vibration, sinusoidal, high frequency.	No discontinuities greater than 1 microsecond. See Note.	AMP Spec 109-21-3. Subject sockets with wires inserted to 15 G's between 10-2000-10 Hz with 100 milliamperes current applied.
Physical shock.	No discontinuities greater than 1 microsecond. See Note.	AMP Spec 109-26-9. Subject sockets with wires inserted to 100 G's sawtooth shock pulses of 6 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.

Figure 1 (continued)

Test Description	Requirement	Procedure
Contact engaging force.	Series I: 24 ounces maximum. All others: 56 ounces maximum.	AMP Spec 109-35. Engage and separate appropriate pin for socket size. See Figure 4.
Contact separating force.	.5 ounce minimum.	AMP Spec 109-35. Engage and separate appropriate pin for socket size. See Figure 4.
Durability.	See Note.	AMP Spec 109-27. Mate and unmate appropriate pin for socket size for 50 cycles. See Figure 4.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	AMP Spec 109-22. Subject sockets with wires inserted to 5 cycles between -65 and 125°C. See Figure 3.
Mixed flowing gas.	See Note.	AMP Spec 109-85-2. Subject sockets with wires inserted to environmental class II for 20 days. See Figure 3.
Corrosion, salt spray.	No base metal exposure on plated surfaces.	AMP Spec 109-24. Condition B. Subject sockets with wires inserted to 5% salt concentration for 48 hours.

**NOTE**

*Shall meet visual requirements, show no physical damage, and shall meet requirements of additional tests as specified in test sequence in Figure 2.*

Figure 1 (end)

## 3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2(c)	3(d)	4(e)
	Test Sequence (b)			
Examination of product	1,10	1,7	1,7	1
Termination resistance, specified current		3,6	3,6	
Termination resistance, dry circuit	4,9	2,5	2,5	
Temperature rise vs current				2
Vibration	7			
Physical shock	8			
Contact engaging force	2			
Contact separating force	3			
Durability	5			
Thermal shock	6			
Mixed flowing gas		4(f)		
Corrosion, salt spray			4(f)	

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Gold plated contacts only.
- (d) Tin plated contacts only.
- (e) Series V samples only.
- (f) Precondition samples with 10 cycles durability.

Figure 2

#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Selection

Sockets shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. All test shall consist of 32 sockets mounted on test boards per Figure 5.

###### B. Test Sequence

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

##### 4.2. Requalification Testing

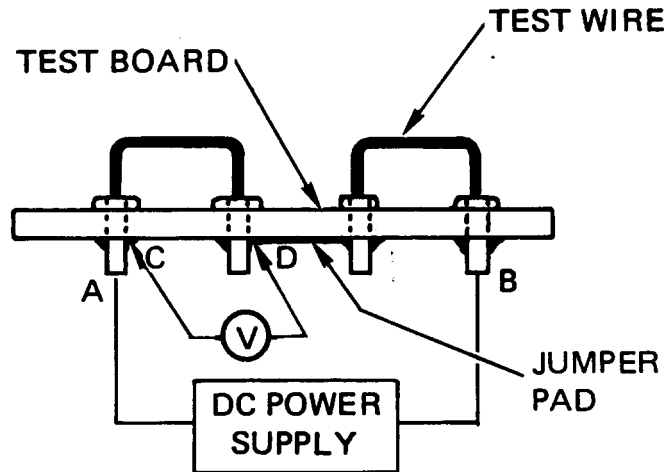
If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

##### 4.3. Acceptance

Acceptance is based on verification that product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### 4.4. Quality Conformance Inspection

The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

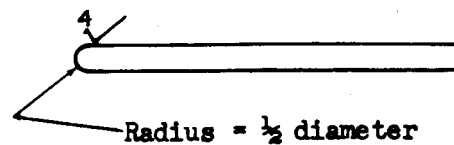


**NOTE**

Test wire shall be commercial, tin plated, solid and uninsulated. Remove any burrs caused by cutting. All test wire length shall be 1 inch. Test wire size shall be as follows.

Socket Series	Test Wire Size
I	24 AWG
II	22 AWG
II	20 AWG
IV	18 AWG
V	16 AWG

Figure 3  
Termination Resistance Measurement Points

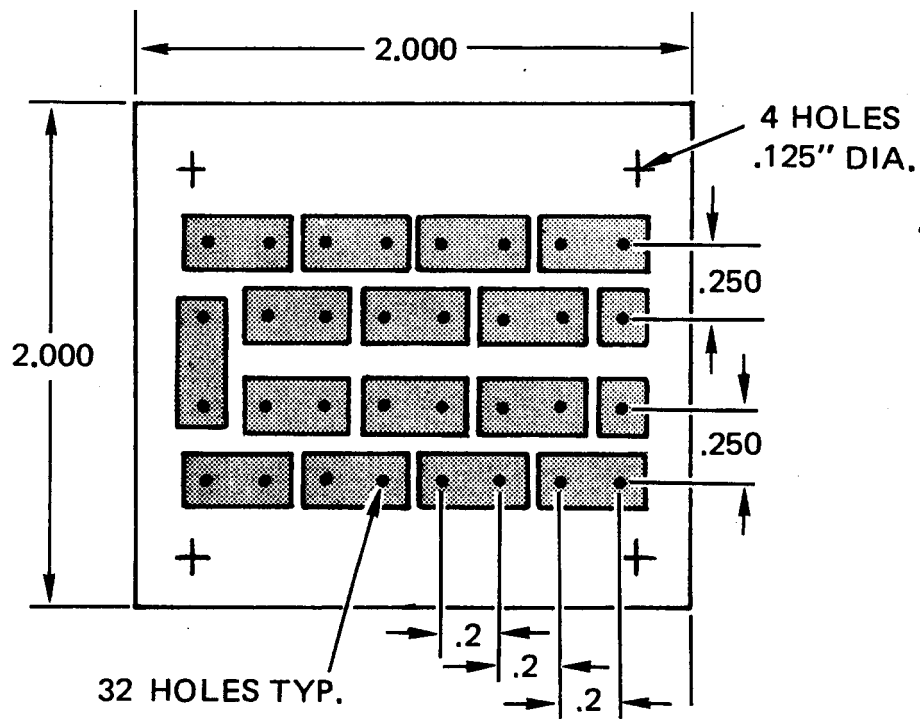


**NOTE**

All gage pins shall be constructed of hardened tool steel. Working surfaces of gage pins which contact spring surfaces shall be finished to 4 microinches. Length of gage pins shall be sufficient to provide full entry of radiused end into spring sockets while maintaining firm grip using holding fixture on opposite end. Gage pin diameters shall be as follows.

Socket Series	Engaging Durability	Separating
I	.017	.014
II	.025	.022
III	.033	.030
IV	.040	.037
V	.057	.055

Figure 4  
Engaging, Separating And Durability Pin Gages



**NOTE** Test boards shall be constructed of .062 thick FR4 glass epoxy with tin plated 2 ounce copper pads on 1 side only.

Figure 5  
Test Boards