Tanden Spring Contact Receptacle

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* Tandem Spring contact receptacle. This contact is a separable, electrical connection device for mating with .025 square posts. It can be crimped to various wire sizes and may be used with or without a connector housing. When housings are used in normal applications the centerline spacing shall be at least .100 and the contact cavity shall have closed entry.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

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.

2.1. AMP Specifications

A. 109-1: General Requirements for Test Specifications
B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
C. 114-25021: Contact Tandem Spring, Application of

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Contact: Phosphor bronze, gold over nickel or tin plated

3.3. Ratings

A. Current: 3 amperes maximum per contact
B. Operating Temperature:

(1) -65° to 105°C for gold plated
(2) -40° to 85°C for tin plated

3.4. Performance and Test Description

Receptacles shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and AMP Spec 114-25021.	Visual, dimensional and functional per applicable inspection plan.
	ELECTRICAL	
Termination Resistance, Specified Current	12 milliohms maximum for gold; 18 milliohms maximum for tin.	Measure potential drop of mated contacts at 3 amperes maximum, see Figure 3; AMP Spec 109-25, calculate resistance.
Termination Resistance, Dry Circuit (Low Level)	12 milliohms maximum for gold; 18 milliohms maximum for tin.	Subject mated contacts to 50 mv open circuit at 100 ma maximum, see Figure 3; AMP Spec 109-6-1.
Crimp Resistance	Wire Size / Specified Current amperes / Resistance milliohms maximum, Initial / Final 22 / 3.0 / 1.1 / 1.6 24 / 3.0 / 1.4 / 2.0 26 / 2.0 / 1.6 / 2.3 28 / 1.5 / 3.0 / 5.0 30 / 1.0 / 4.0 / 7.0 32 / 0.5 / 6.0 / 10.0	Measure potential drop across crimped contact at specified current, see Figure 3; AMP Spec 109-25.

Figure 1 (cont)

Test Description	Requirement	Procedure
Dielectric Withstanding Voltage	1000 vac (rms) dielectric withstanding voltage, one minute hold. No breakdown or flashover.	Test between adjacent contacts of unmated connector assemblies; AMP Spec 109-29-1.
Insulation Resistance	1000 megohms minimum.	Test between adjacent contacts of mated connector assembly; AMP Spec 109-28-4.
Current Cycling	Crimp resistance, final.	Subject mated contacts to 50 cycles at 125% rated current for 30 minutes "ON" - 15 minutes "OFF"; AMP Spec 109-51, cond B, test method 3.
	MECHANICAL	
Vibration	No discontinuities greater than 1 microsecond.	Subject mated connectors to 15 G's, 10-2000 Hz with 100 ma current applied; AMP Spec 109-21-3.
Physical Shock (b)	No discontinuities greater than 1 microsecond.	Subject mated connector to 100 G's sawtooth in 6 milliseconds; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks; AMP Spec 109-26-9.
Mating Force	Maximum forces shall be same as contact engaging test on various pressure types.	Measure force necessary to mate connector assembly from point of initial contact at a rate of 0.5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.
Unmating Force	Minimum forces shall be same as contact separating test on various pressure types.	Measure force necessary to unmate connector assembly with locking latches removed, at a rate of 0.5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.

Test Description	Requirement	Procedure
Contact Retention	3 pounds minimum.	Apply axial load of 3 pounds to crimped contacts; AMP Spec 109-30 except grip contact lead.
Contact Engaging Force	Pressure Type / Force, maximum ounces: High 14.0; Standard 10.6; Low 5.0	Measure force to engage using gage 1, as indicated in Figure 4, AMP Spec 109-35.
Contact Separating Force	Pressure Type / Force, minimum ounces: High 2.5; Standard 1.4; Low 0.7	Size 3 times using gage 1, as indicated in Figure 4, insert gage 2 and measure force to separate; AMP Spec 109-35.
Crimp Tensile	Wire Size, AWG / Tensile minimum pounds: 22 11.0; 24 7.0; 26 4.0; 28 2.5; 30 1.5; 32 1.0	Determine crimp tensile at a rate of 1 inch/minute; AMP Spec 109-16.
Durability	Termination resistance, dry circuit and specified current; contact separation force. No physical damage.	Mate and unmate for number cycles indicated using gage 3, see Figure 4; AMP Spec 109-27. Press Type / Plating, Micro-inch / Cycles: High 30 gold 100; Std. 30 gold 200; Low 30 gold 200; High 100 tin 25; Std. 100 tin 25; Low 100 tin 25
ENVIRONMENTAL		
Thermal Shock	No physical damage.	Subject unmated connectors to 5 cycles between -65° and 105°C for gold and -40° and 85°C for tin; AMP Spec 109-22.

Figure 1 (cont)

Test Description	Requirement	Procedure
Humidity-Temperature Cycling	1000 megohms final insulation resistance; 18.0 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond 5, with cold shock at -10°C, less step 7b.
Corrosion, Salt Spray	Termination resistance, dry circuit and rated current.	Subject mated connectors to 5% salt concentration for 24 hours; AMP Spec 109-24, cond B.

(a) The continuous current rating for individual contacts cannot be applied directly to the number of contacts as they are dependent on the thermal and physical properties of the materials. System design shall assure that continuous current rating does not create internal hot spots that exceed the temperature designated by the connector specification, during steady-state or transient conditions.

(b) Shall remain mated and show no evidence of damage, cracking or chipping.

Figure 1 (end)

3.6. Receptacle Tests and Sequences

Test or Examination	Test Group (a)		
	1	2	3
	Test Sequence (b)		
Examination of Product	1	1	1
Termination Resistance, Specified Current	3,13	3,11	
Termination Resistance, Dry Circuit	2,12	2,10	
Crimp Resistance			2,4
Dielectric Withstanding Voltage	5,11		
Insulation Resistance	4,10		
Current Cycling			3
Vibration		8	
Physical Shock		9	
Mating Force (e)			
Unmating Force (e)			
Contact Retention		12	
Contact Engaging Force		4	
Contact Separating Force	8	5,7	
Crimp Tensile			5
Durability	7	6	
Thermal Shock	6		
Humidity-Temperature Cycling (d)	9		
Corrosion, Salt Spray (c)	9		

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Gold plated contacts only.
(d) Tin plated contacts only.
(e) This test assures mating and unmating forces meet the requirements of engaging and separating forces.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test groups 1 and 2 shall each consist of 30 contacts of each material and plating finish. Test group 3 shall consist of 30 contacts of each style and desired wire size.

B. Test Sequence

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

C. Acceptance

(1) All samples tested in accordance with this specification shall meet the stated tolerance limit.

(2) 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.

4.2. Quality Conformance Inspection

The applicable AMP inspection plan will 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.

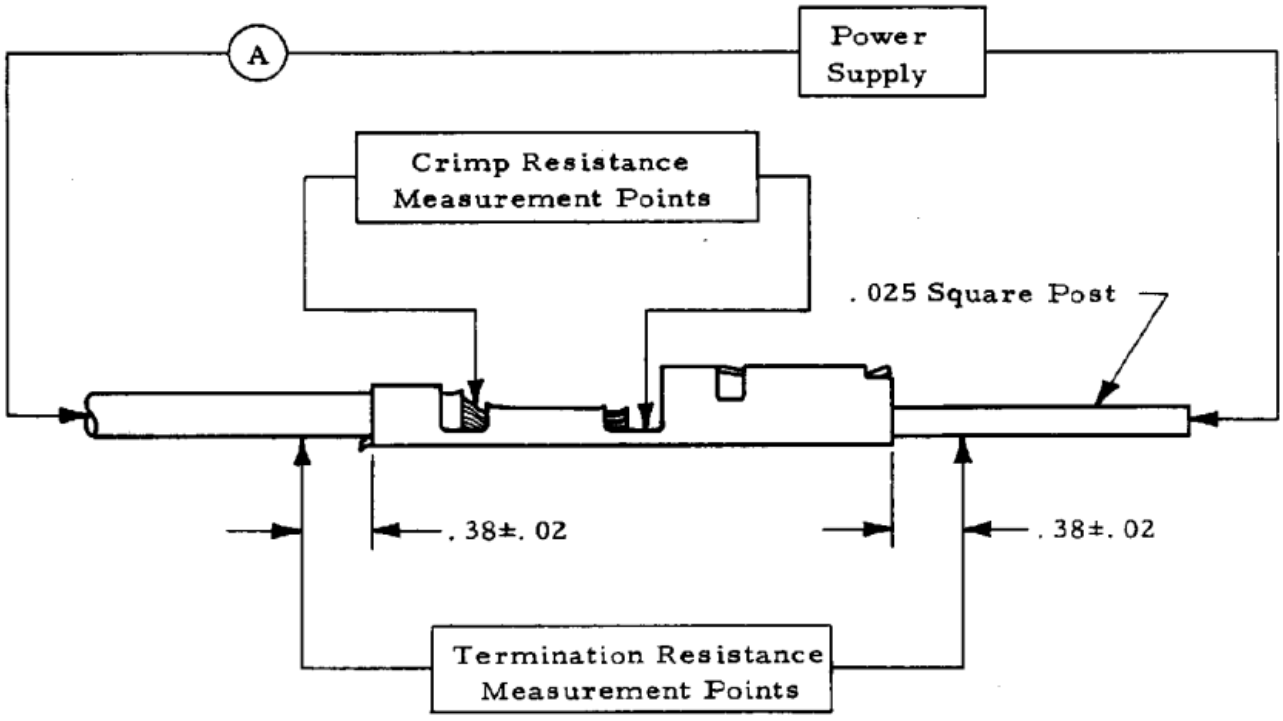
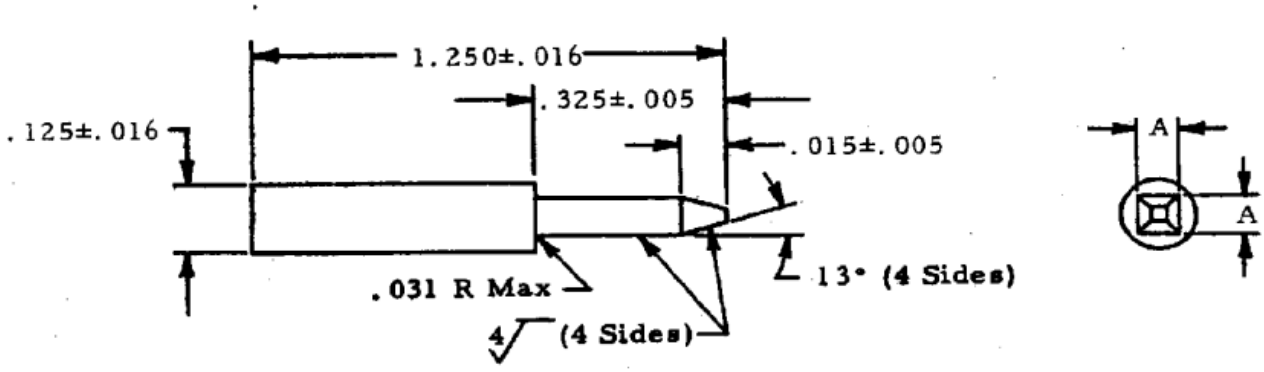


Figure 3

Termination and Crimp Resistance Measurement Points



Notes:

1. Tolerance: ±.005 or ±2°C as applicable, unless otherwise specified.
2. Material: Tool steel, AISI type 02 per AMP Specification 100-15.
3. Heat Treat: Rockwell C50-55.
4. Gage surface shall be clean of contaminate or lubricants.

Gage	A
1	$.0260^{+.0000}_{-.0001}$
2	$.0240^{+.0001}_{-.0000}$

Figure 4

Engaging, Separating and Durability Gages

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- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

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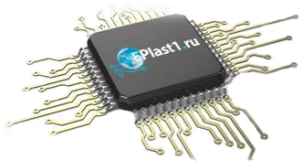
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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