PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* SIMM (Single In-Line Memory Module), Cam-in, right angle and vertical sockets. These sockets have been designed to provide highly reliable, space saving sockets that will interface between a hybrid board and a circuit board. They are designed for automatic and semi-automatic applications, the number of circuits per socket will range from 40 to 84 on .050 pitch styles and from 30 to 35 on .100 pitch style accommodating a module board thickness of .050 ± .006. (Module boards falling outside the recommended layout dimensions shown on AMP Customer drawings should be submitted to AMP Incorporated for engineering approval).

1.2. Qualification

When tests are performed on subject product line, procedures specified in AMP 109 series specifications 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 extent specified herein. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1. AMP Documents

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. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
D. 114-1060: Application Specification
E. 501-209: Test Report

3. REQUIREMENTS

3.1. Design and Construction

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

*Trademark

Product Code: 1710, 1744

LTR	REVISION RECORD	APP	DATE
0	Release per EC 0160-3318-93	[signature]	5/12/93

DR Brent A. Beckley 4/2/93
CHK [signature] 4/17/93
APP [signature] 5/5/93

AMP Incorporated
Harrisburg, PA 17105-3608

NO 108-1297 REV 0 LOC B

TITLE SOCKET, SIMM, CAM-IN, RIGHT ANGLE AND VERTICAL .050 AND .100 CENTERLINE

3.2. Materials

A. Contact: Phosphor bronze, post plated tin/lead or gold over nickel
B. Housing: Liquid crystal polymer, glass filled, UL94V-0

3.3. Ratings

A. Voltage: 250 vac
B. Current: See Figure 3 for applicable current carrying capability for signal application
C. Operating temperature: -55 to 105°C
D. Continuous temperature: 85°C maximum

3.4. Performance and Test Description

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. All tests are performed at ambient environmental conditions per AMP Specification 109-1 unless otherwise specified.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing and AMP Spec 114-1060.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	20 milliohms maximum initial. ΔR 20 milliohms maximum.	Subject socket mated with appropriate test board to 20 mv open circuit at 100 ma maximum. See Figures 4 and 8. AMP Spec 109-6-6.
Dielectric withstanding voltage.	1 kVAC dielectric withstanding voltage. 1 minute hold. See Note (a).	Test between adjacent contacts of unmated and unmounted socket assemblies. AMP Spec 109-29-1.
Insulation resistance.	10000 megohms minimum initial. 5000 megohms minimum final. See Note (a).	Test between adjacent contacts of unmated and unmounted socket assemblies. AMP Spec 109-28-4.
Capacitance.	2 picofarads maximum for .050 centerline spacing. 1.2 picofarads maximum for .100 centerline spacing. See Note (a).	Test between adjacent contacts of unmated and unmounted socket assemblies. AMP Spec 109-47, Condition E.

Figure 1 (cont)

Test Description	Requirement	Procedure
MECHANICAL		
Vibration, sinusoidal, low frequency.	No discontinuities greater than 1 microsecond. See Note (b).	Subject sockets mated with appropriate weighted test board to 10-55-10 Hz traversed in 1 minute at .06 inch total excursion. 2 hours in each of 3 mutually perpendicular planes. See Figure 10. AMP Spec 109-21-1.
Physical shock.	No discontinuities greater than 1 microsecond. See Note (b).	Subject sockets mated with appropriate weighted test board to 50 G's sawtooth shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 shocks total. See Figure 10. AMP Spec 109-26-7.
Contact retention.	No damage or loosening of contacts.	Apply axial load of 2 pounds to front. See Figure 6. AMP Spec 109-30.
Durability.	No physical damage.	Insert and fully lock gage 1, unlock and fully remove gage 1. Repeat for 25 cycles. See Figure 5. AMP Spec 109-27.
Housing lock strength.	6 pounds minimum (both latches).	Determine strength of housing locking mechanism using gage 2. See Figures 5 and 7.
Solderability.	Contact tabs shall have minimum of 95% solder coverage.	Subject sockets to solderability. AMP Spec 109-11-3.
Resistance to soldering heat.	No physical damage.	Immerse sockets mounted on glass epoxy wiring board in solder bath at 260°C for 10 seconds at rate of of 1 $\pm$ .25 inch per second. AMP Spec 109-63-2.

Figure 1 (cont)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal shock.	See Note (b).	Subject socket mated with appropriate test board to 25 cycles between -55 and 105°C. See Figure 8. AMP Spec 109-22.
Humidity-temperature cycling.	See Note (b).	Subject socket mated with appropriate test board to 10 humidity-temperature cycles between 25 and 65°C at 95%RH. See Figure 8. AMP Spec 109-23-5, Condition B.
Mixed flowing gas.	See Note (b). See Note (c).	Subject socket mated with appropriate test board to environmental class II for 20 days. See Figure 8. AMP Spec 109-85-2.
Temperature life.	See Note (b).	Subject socket mated with appropriate test board to temperature life at 105°C for 160 hours. See Figure 8. AMP Spec 109-43, Test Level 10.

(a) Make 10 readings per socket.
(b) Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in test sequence in Figure 2.
(c) Applies only to gold plated contacts.

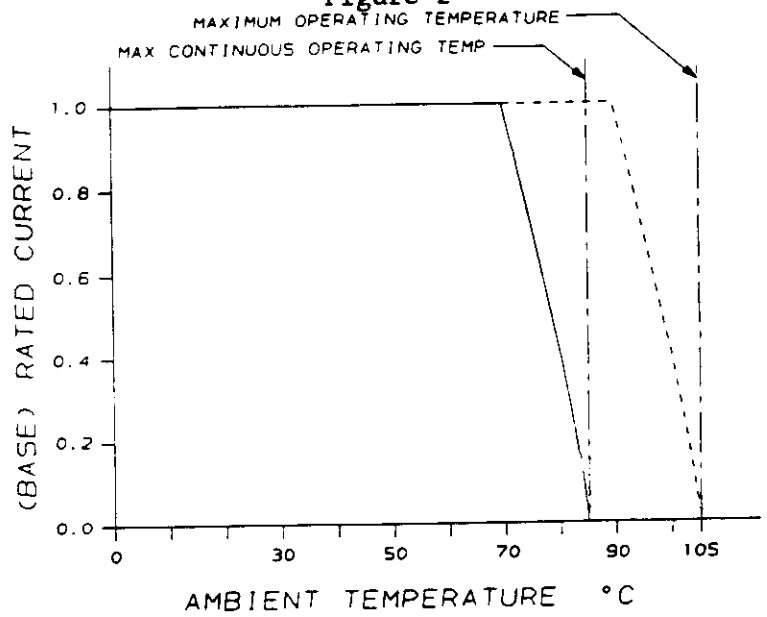
Figure 1 (end)

3.6. Socket Qualification Tests and Sequences

Test or Examination	Test Group (a)						
	1(e)	2	3	4	5(d)	6	7
	Test Sequence (b)						
Examination of product	1,5	1,5	1,6	1,9	1,7	1,4	1,4
Termination resistance, dry circuit	2,4	2,4	2,5		2,6		
Dielectric withstanding voltage (c)				4,8			
Insulation resistance (c)				2,7			
Capacitance				3			
Vibration					4		
Physical shock					5		
Contact retention						2	
Durability					3		
Housing lock strength							3
Solderability							2
Resistance to soldering heat						3	
Thermal shock			3(f)	5			
Humidity-temperature cycling			4	6			
Mixed flowing gas	3(f)						
Temperature life		3(f)					

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Make 10 readings per socket.
(d) Use 2 test boards wired for resistance and 2 wired for discontinuity.
(e) Applies only to gold plated contacts.
(f) Precondition samples with 5 cycles durability

Figure 2



Current vs Temperature Rating for Single Circuit, I (rms) or I DC, Continuous Rating

Figure 3
Current Carrying Capability

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Socket assemblies shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test groups 4, 6, and 7 shall consist of 2 unmounted 80 position sockets with .050 centers and/or 2 unmounted 30 position sockets with .100 centers. Test groups 1 or 3, 2 and 5 shall consist of four 80 position sockets with .050 centers and/or four 30 position sockets with .100 centers which shall be soldered to printed circuit boards per the applicable Application Sheets.

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 product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify 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

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

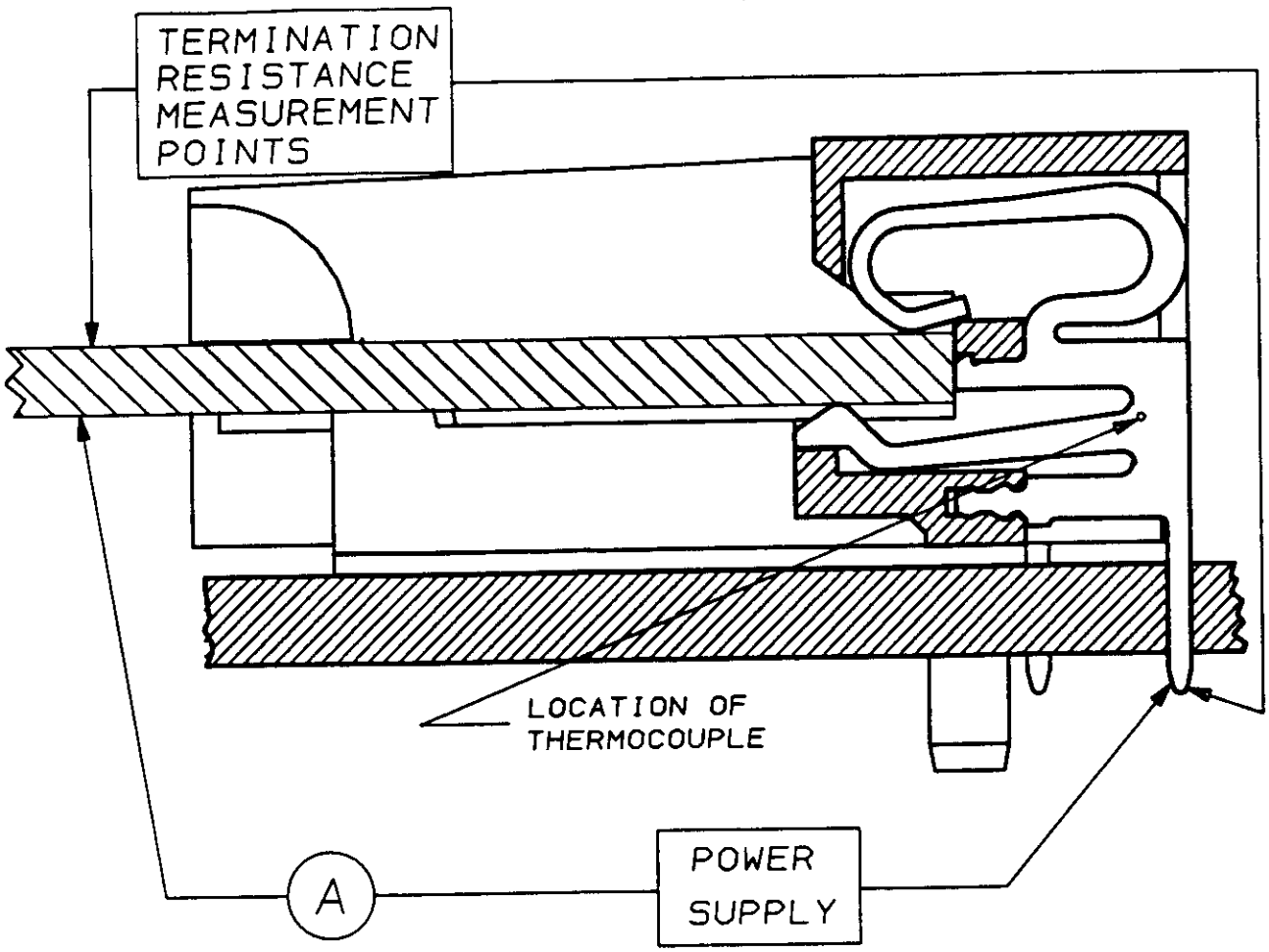
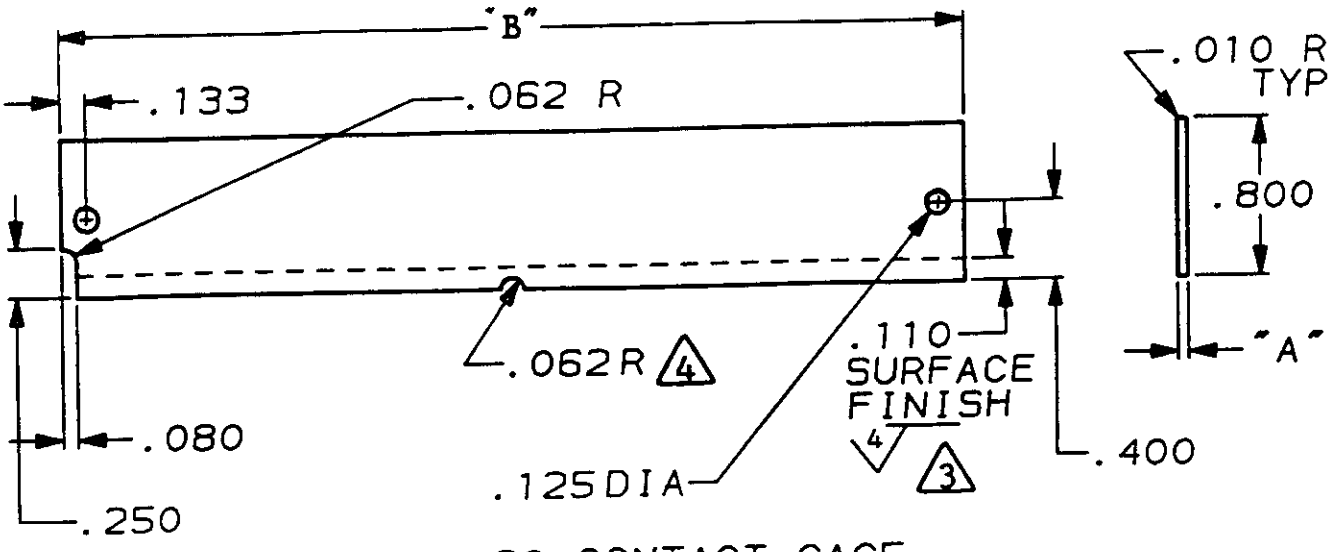


Figure 4
Resistance and Temperature Measurement Points

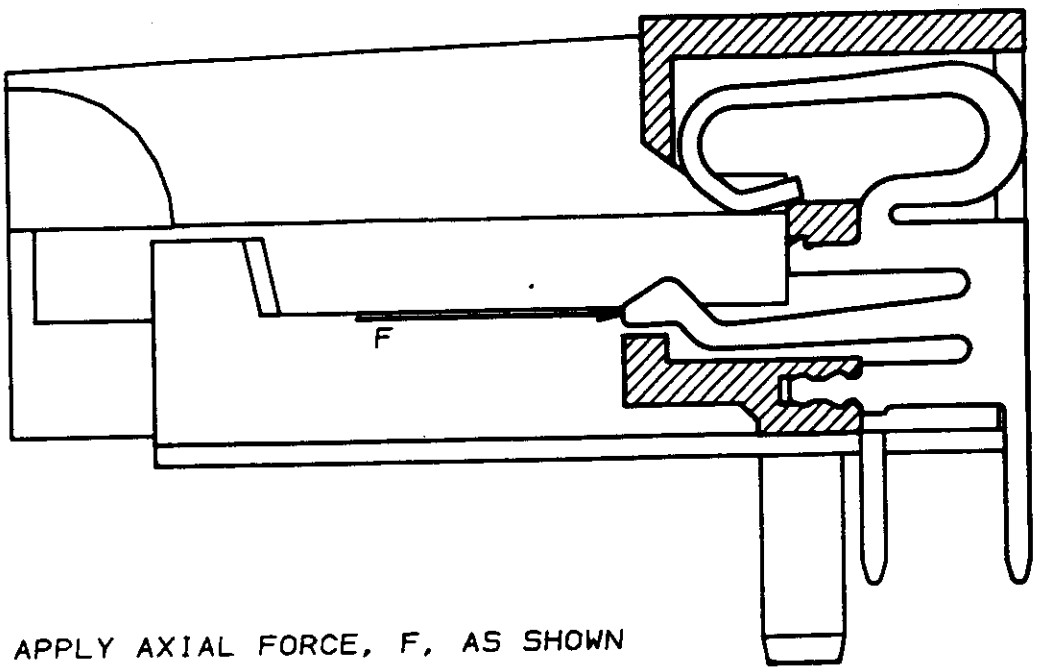


80 CONTACT GAGE

Gage Number	A Dimension ± .0002	B Dimension ± .003 Centerline	
		.050	.100
1	.054	4.650	3.500
2	.050	4.650	3.500

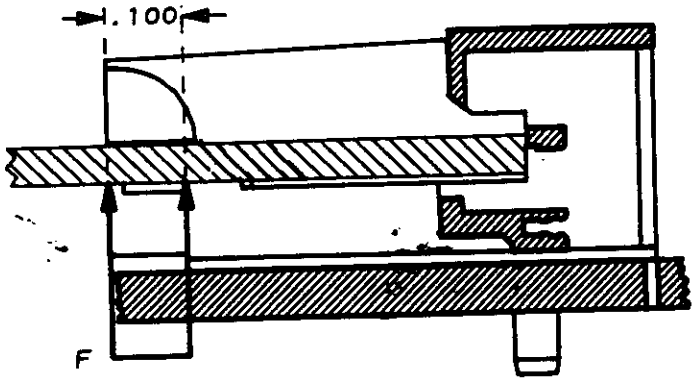
Note: (1) All gage surfaces shall be clean of contaminants or lubricants.
(2) All gages shall be manufactured from hardened tool steel, Rockwell C, 58 to 60.
(3) Gage 2 does not require special surface finish.
(4) Gages for use with .100 centerline connectors do not require .062 center radius.

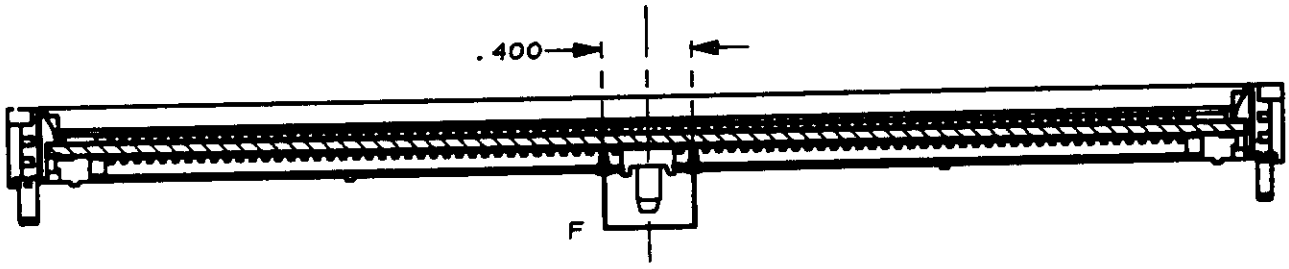
Figure 5
Test Gages



APPLY AXIAL FORCE, F, AS SHOWN

Figure 6
Contact Retention

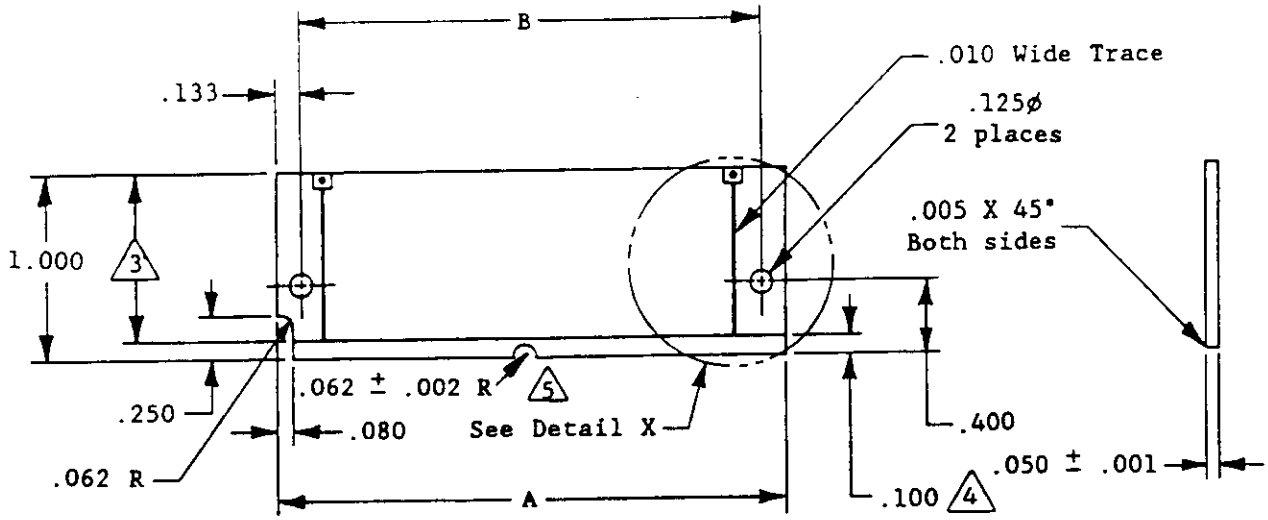


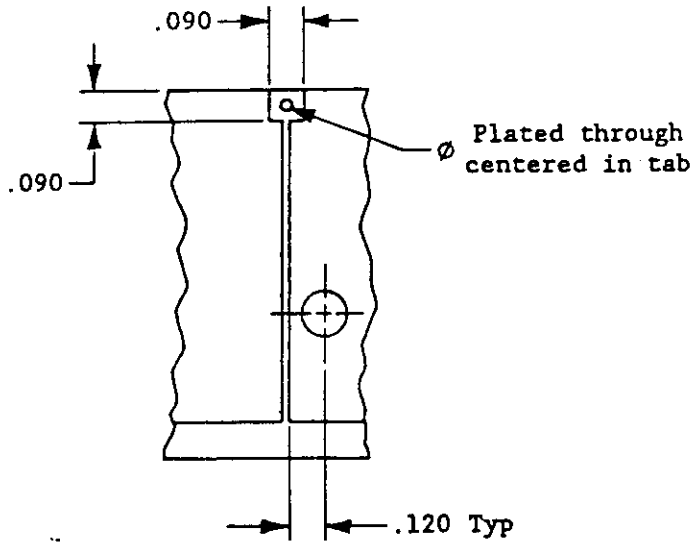


APPLY FORCE, F, AS SHOWN
USING A .400 X .100 PIN.

Note: Remove all contacts prior to test.

Figure 7
Housing Locking Strength





Detail X

	.050 Centerline 80 Position	.100 Centerline 30 Position
A Dimension ± .005	4.650	3.500
B Dimension ± .004	4.384	3.234

Note: (1) Material: Glass epoxy laminate, copper clad, 1/2 ounce 2 sides, Type FR4.

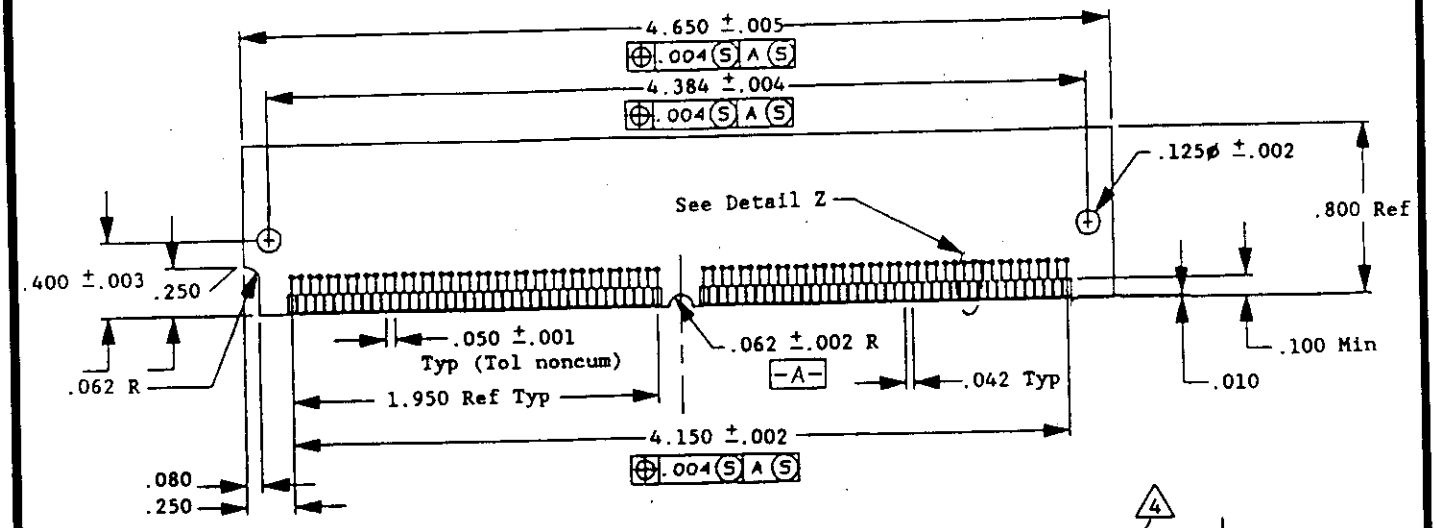
(2) Finish: Underplate overall with .000050 minimum thickness nickel.

(3) Finish: Area 3 , overplate with .000100 to .000200 thick 60/40 tin-lead.

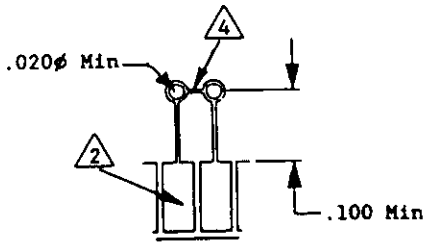
(4) Finish: Area 4 , overplate with .000030 minimum thickness gold or .000100 to .000200 thick tin-lead.

5 Radius not required for .100 centerline boards.

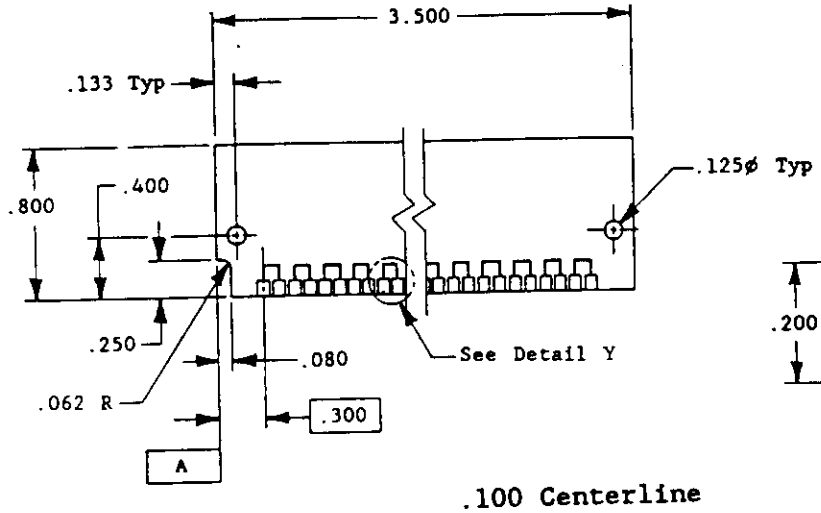
Figure 8
Termination Resistance Test Boards



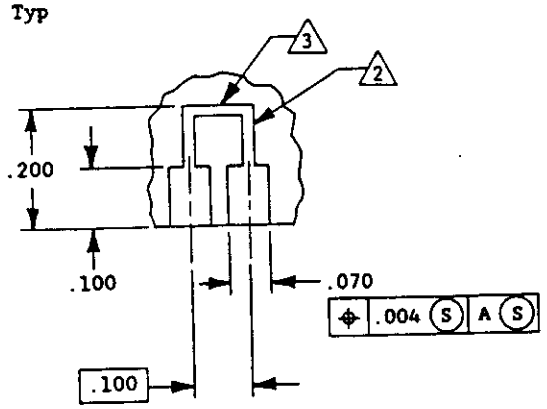
.050 Centerline
80 Position



Detail Z



.100 Centerline
30 Position



Detail Y

Note: (1) Material: Glass epoxy laminate, copper clad, 1 ounce 2 sides, Type FR4.

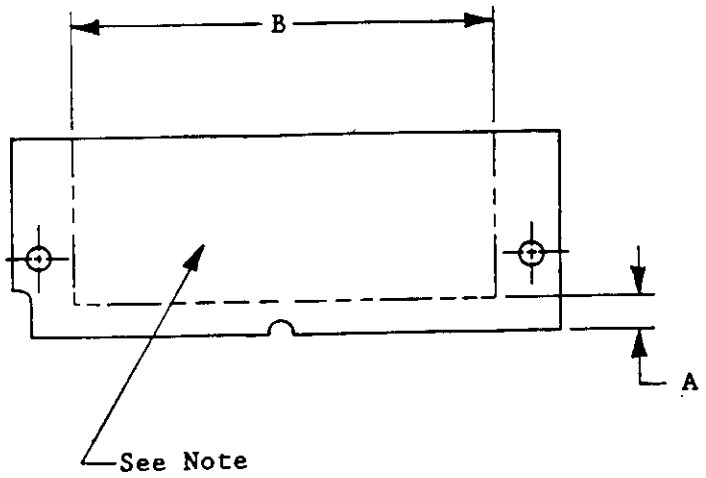
(2) Area 2 , copper contact pads shall be overplated with .000050 minimum thickness nickel followed by .000100 minimum thickness tin-lead or .000030 minimum thickness gold. Pads are located on both sides of board.

(3) Area 3 , traces are .020 wide located as shown.

(4) Area 4 , traces are .010 wide located as shown.

(5) Printed circuit board thickness across pads shall be .050 ± .003.

Figure 9
Continuity Monitoring Test Boards



	.050 Centerline 80 Position	.100 Centerline 30 Position
A Dimension	.220 Minimum	.150 Minimum
B Dimension	4.025 Maximum	2.875 Maximum
Weight	12 grams	12.6 grams

Note: Attach appropriate weight per chart (aluminum or steel) in this area using screws. Ensure isolation from any conductor traces on test board. See Figures 8 and 9 for test board layouts.

Figure 10
Weighted Test Boards