
DIPLOMATE* DL (Dual Leaf) Low Profile DIP Socket

1. SCOPE**1.1. Content**

This specification covers performance, tests and quality requirements for DIPLOMATE* DL (dual leaf) low profile DIP socket. This family of sockets has been designed to provide a highly reliable, low cost space saving socket header. They are designed for automatic and semi-automatic application and include 6, 8, 14, 16, 18 and 20 positions with a row spacing of .300 inch; 22 position with a row spacing of .400 inch; and 24, 28 and 40 position with a row spacing of .600 inch.

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. Unless otherwise specified, latest edition of the document applies. 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. 114-1049: Application Specification
- E. 501-29, Rev B: Test Report

3. REQUIREMENTS**3.1. Design and Construction**

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

3.2. Materials

- A. Contact: Phosphor bronze or beryllium copper, pre-tin or gold
- B. Housing: Polyester, glass filled, UL94V-0

3.3. Ratings

- A. Voltage/Current: Signal application only
- B. Temperature:
 - (1) Tin plating: -55 to 105°C
 - (2) Gold plating: -55 to 125°C

3.4. Performance and Test Description

Sockets shall be designed to meet 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 114-1049.	Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Termination resistance, dry circuit.	20 milliohms maximum initial. ΔR 10 milliohms maximum.	Subject socket mated with dummy IC module to 20 mv open circuit at 100 ma maximum. Read all contacts. See Figure 3. AMP Spec 109-6-6.
Dielectric withstanding voltage.	1.0 kvac dielectric withstanding voltage. 1 minute hold. See Note (b).	Test between adjacent contacts of unmated and unmounted socket assemblies. AMP Spec 109-29-1.
Insulation resistance.	10000 megohms minimum. See Note (b).	Test between adjacent contacts of unmated and unmounted socket assemblies. AMP Spec 109-28-4.
Capacitance.	0.5 picofarad maximum. See Note (b).	Test between adjacent circuits of unmated and unmounted socket assemblies. AMP Spec 109-47, Condition E.

Figure 1 (cont)

Test Description	Requirement	Procedure
MECHANICAL		
Vibration.	No discontinuities greater than 1 microsecond.	Subject socket mated with IC package to 15 G's, 10-2000 Hz with 100 ma current applied. AMP Spec 109-21-3.
Physical shock.	No discontinuities greater than 1 microsecond.	Subject socket mated with IC package to 100 G's sawtooth shock pulses of 6 milliseconds duration with 100 ma current applied. 1 shock in each of 3 mutually perpendicular planes, 6 total shocks. AMP Spec 109-26-9.
Engaging force.	340 grams maximum initial.	Measure force necessary to engage socket assembly with cluster gage, .013 inch thick a distance of .050 ±.005 inch from point of initial contact using free floating fixtures at rate of 0.5 inch per minute. Calculate force per contact. See Figure 4. AMP Spec 109-35.
Separating force.	25 grams minimum.	After 2 unmonitored cycles of preconditioning gage, .015 inch thick, measure force necessary to separate socket and .008 X .015 inch gage at rate of 0.5 inch per minute. Contaminates and oils are to be removed from socket contacts and gage pin cleaned per Para 4.1. of AMP Spec 109-35. See Figures 4 and 5.
Contact retention.	No damage of loosening of contacts.	Apply axial load of 340 grams to contact. AMP Spec 109-30.

Figure 1 (cont)

Test Description	Requirement	Procedure
Durability.	No physical damage.	Mate and unmate socket assemblies and test pin gage, .015 inch thick, for 50 cycles for solder tail socket and 25 cycles for surface mount socket at rate of 0.5 inch per minute. See Figure 4. AMP Spec 109-27.
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 socket mounted on glass epoxy wiring board to solder bath at 260 $\pm 5^{\circ}\text{C}$ for 10 seconds at rate of 1 \pm .25 inch per second. AMP Spec 109-63-2.
ENVIRONMENTAL		
Thermal shock.	See Note (a).	Subject unmated socket to 5 cycles between -55 and 105°C for tin and -55 and 125°C for gold. AMP Spec 109-22.
Humidity-temperature cycling.	See Note (a).	Subject unmated socket to 10 humidity-temperature cycles between 25 and 65°C at 95% RH. AMP Spec 109-23, Method III, Condition B with cold shock at -10°C .
Fixed flowing gas.	See Note (a).	Subject socket mated with dummy IC module to environmental class II for 14 days. See Figure 3. AMP Spec 109-85-2.
Temperature life.	See Note (a).	Subject socket mated with IC package to temperature life at 105°C for 96 hours. AMP Spec 109-43.

- a) Shall remain mated and show no evidence of damage, cracking or chipping.
b) Measure 7 readings per socket.

Figure 1 (end)

3.6. Product Qualification and Requalification Test Sequence

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

- (a) See Para 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Gold plated contacts only.
- (d) Solder tail sockets only.
- (e) Tested with mated socket.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Sockets shall be selected at random from current production. Each test group 2 sockets. Test groups 1, 3 and 7 samples shall be tested with conventional IC packages. Test group 2 shall be tested with dummy IC modules per Figure 3.

B. Test Sequence

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

4.2. Requalification Testing

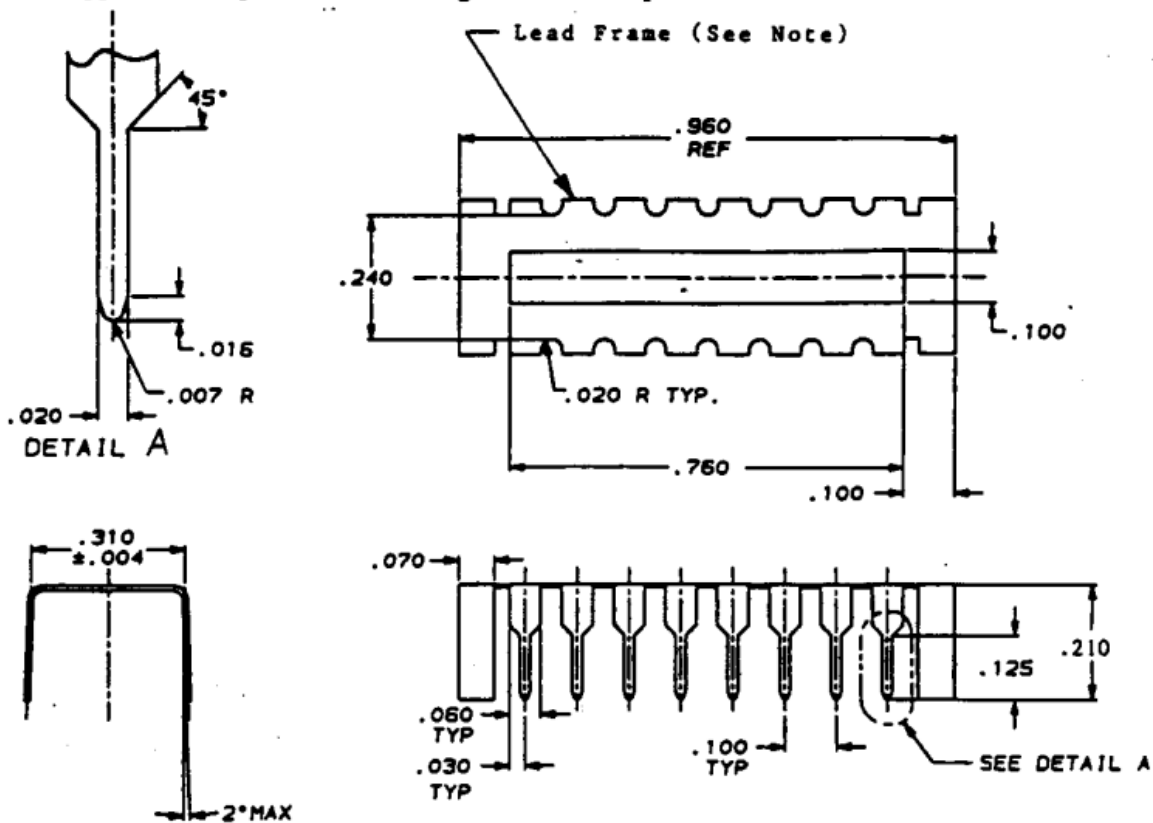
If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

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.

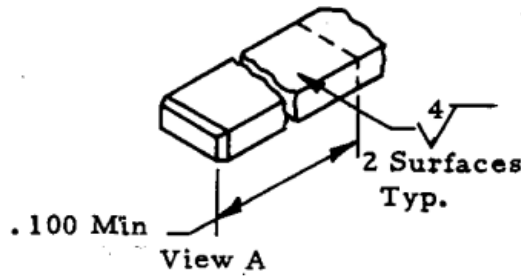
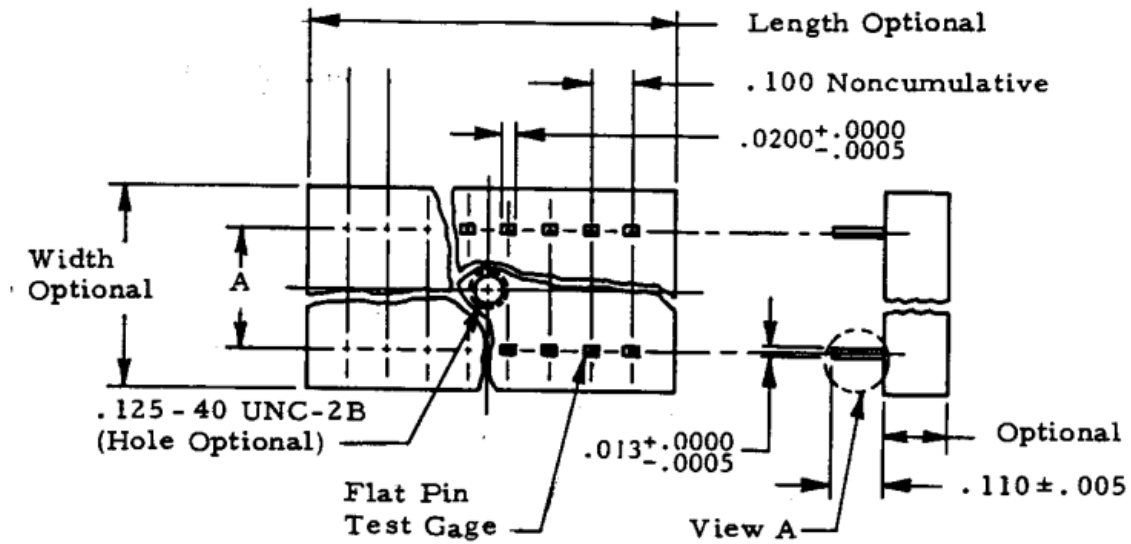
4.4. Quality Conformance Inspection

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.



Note: Lead frame 87-1529-5 is .010 inch thick phosphor bronze alloy per AMP Specification 100-221 and shall be plated with a .000100 minimum tin per AMP Specification 112-16-3. After plating, dummy IC module shall be cut from strip and formed as indicated.

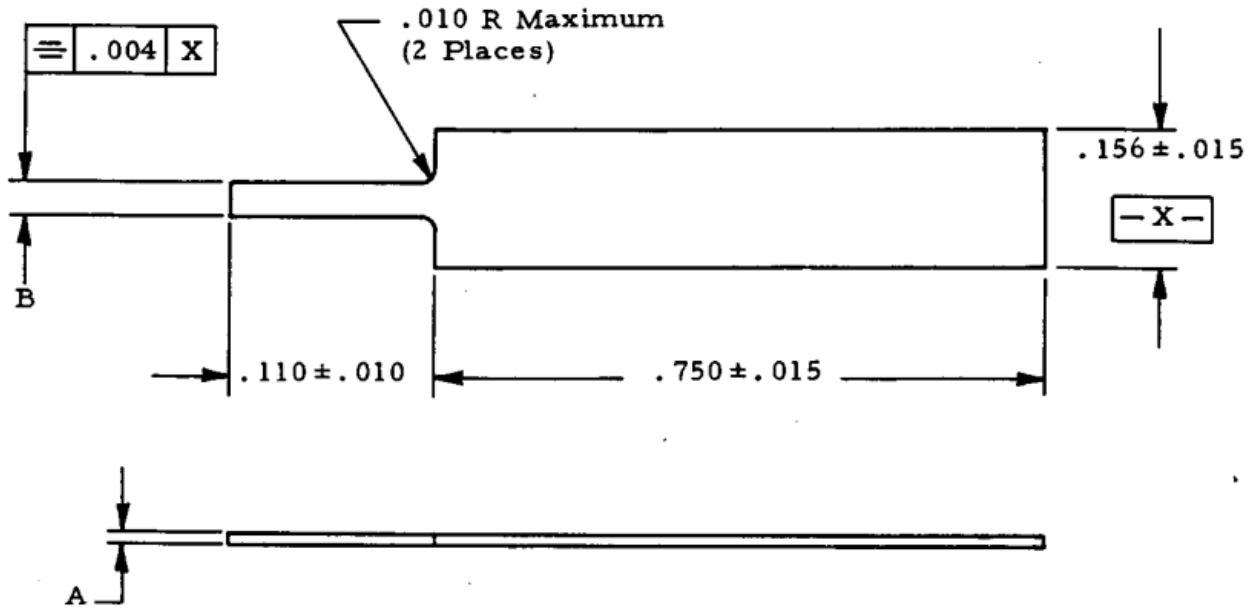
Figure 3
Dummy IC module Fabrication For 16 Position Socket



Number Of Leads	Leads Per Row	A ± .001
6	3	.300
8	4	.300
14	7	.300
16	8	.300
18	9	.300
20	10	.300
22	11	.400
24	12	.600
28	14	.600
40	20	.600

- Note: (1) Acceptable chamfer on flat pin to be .003/.005 X 45° all sides.
 (2) Gage .0150 ± .0005 inch thick by .0210 ± .0005 inch wide is preconditioning gage.

Figure 4
Mating Test Gage Pins



Test Pin Number	Part number	A Dimension	B Dimension
1	103460-4	.008 +.0000/-.0005	.015 +.0000/-.0005

- Note: (1) All dimensions are in inches.
 (2) Test pins shall be steel feeler gage stock with 4 microinch finish on mating surfaces.
 (3) Acceptable chamfer on pin .002/.004 X 45° all sides.

Figure 5
 Separating Force Test Pin