



**250 Series Flag Positive Lock MK II Connector**

**1. Scope :**

This specification covers general requirements for performance characteristics and test methods of “250” Series Positive Lock Connectors.  
Applicable product description and part numbers are as shown in Table 1.

**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.

Product Part Number	Descriptions
85091 - <input type="checkbox"/>	<b>250 2-Position Positive Lock Housing</b>
936603 - <input type="checkbox"/>	<b>“250” Series, Positive Lock Receptacle Contact</b>
936604 - <input type="checkbox"/>	<b>“250” Series, Positive Lock Receptacle Contact</b>
936605 - <input type="checkbox"/>	<b>“250” Series, Positive Lock Receptacle Contact</b>

Table 1

**3. Requirements**

**3.1 Design and Construction**

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

**A. Receptacle Contact**

The receptacle contact is encapsulated in connector housing after crimping on the wire.

To release the locking mechanism, a simple pull-off action onto the wire by holding the connector is just enough to unlock the parts, since the locking device is made to be released only when the parts are intendedly separated with the housing properly held in hand.

**B. Housing**

Housing is a molded one-piece insulating enclosure, consisting of lower fit for receiving contact and upper lid which is folded over to wrap the contact in the cavity and is locked by two locking detents hooking on the rolling of contact.



**3.2 Material and Plating**

- A. Contact  
936603-1, 936604-1, 936605-1 : Pre-tin Brass
- B. Housing : 66 Nylon ( 94V-2 )
- C. Customer TAB : 7/3 Brass ( JIS-H-3100, C2600P or R 1/2H)  
Plain or Pre-tin

**3.3 Ratings:**

- A. Temperature Rating :  
  
-40 °C ~ + 105 °C ( Ambient temperature + temperature rising due to application of current )
- B. Applicable Wire Size

Product Part No.	936603-□	936604-□	936605-□
Wire			
Wire Size (mm <sup>2</sup> )	0.3~0.75	0.75~2.0	2.0
Insulation Diameter (mm)	1.5~2.8	2.2 ~3.4	3.0 ~ 3.7

**3.4 Test Requirements and Procedures Summary**

Test Items	Requirements				Procedures
Appearance of Product	Product shall appear normal without evidence of defects such as cracks, breakage, damage, rattling or loose of parts rust and fusion that are detrimental to connector functions.				Visually and tactually inspect parts for appearance in accordance with applicable Q.I.P. (Quality Inspection Procedure) for presence of stated defects.
Crimp Tensile Strength : (Para. 3.4.1)	Wire Size		Tensile Strength		Contacts crimped with wires of specified size shown in Table 6, are subject to the test by applying an axial pull-off load to crimped wire on tensile testing machine after being fastened on the head. The head is operated to travel with the speed at a rate of 100mm a minute. Crimp tensile strength is determined when the wire is broken or is pulled off form the wire crimp. For this test, insulation crimp is excluded.
	mm <sup>2</sup>	(AWG)	N	( lbs.)	
	0.3	(#22)	49	(11.02)	
	0.5	(#20)	78.5	(17.65)	
	0.75	(#18)	117.7	(26.46)	
	1.25	(#16)	205.9	(46.28)	
	2.0	(#14)	313.8	(70.54)	
	Minimum value, required				



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<p>Contact Retention Force : (Para. 7.1.3)</p>	<p>6.0 kg (13.23 lbs.) Min.</p>				<p>Fasten contact-loaded connector assembly onto head of tensile testing machine, and apply an axial pull off load to wire end of loaded contact, by operating the head to travel with the speed at a rate of 100mm a minute. Contact retention force is determined when the contact is dislodged from housing. For this test, wire of 0.75 mm<sup>2</sup> (#18) or greater shall be used.</p>
<p>Mated/Locked Contact Retention Force : (Para. 7.1.4)</p>	<p>8.0 kg (17.64 lbs.)Min.</p>	<p>Initially</p>			<p>Contact crimped on an approx. 100mm-long, 1.25 mm<sup>2</sup> (#16) or greater wire and loaded in housing, is mated with the counterpart tab contact. Sample connector is fastened on the head of tensile testing machine so that the mated tab is pulled by operating the head to travel with the speed at a rate of 100mm a minute. Mated/locked contact retention force is determined when locking device disengages locking, or is broken by the load.</p>
	<p>7.0 kg (15.43 lbs.)Min.</p>	<p>Finally</p>			
	<p>* Measure only 1P among 2P.</p>				
<p>Connector Insertion and Extraction Force (Para. 7.1.5)</p>	<p>Requirements ( Kg )</p>				<p>Fasten contact loaded connector and counterpart tab contact on tensile testing machine in the manner that they mate and un-mate as the head is operated. Apply axial load to push in and pull off the part by operating the head to travel with the speed at a rate of 100mm a minute. For this test, housing locking device is set no being in effect when extraction</p>
	<p>Insertion Force</p>	<p>2-Pos</p>	<p>8.0 kg</p>	<p>Max.</p>	
<p>Extraction Force</p>	<p>2-pos</p>	<p>3.0 kg</p>	<p>Min.</p>		

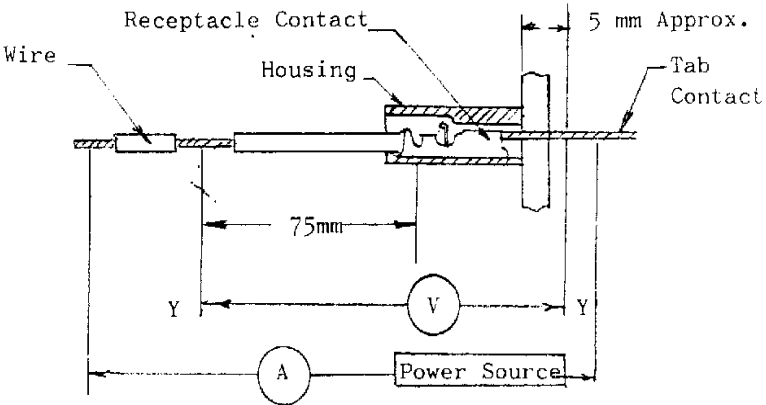
Termination Resistance : (Para. 7.1.6)	Initial	3 m Ω (Max.)	Contact loaded and mated connector assembly is tested by applying test current of 1A(DC) flowing the circuit including mated area. After temperature rising of the energized circuit becomes stabilized, measure millivolt drop by probing at the points 75mm apart from wire crimp and on mated tab contact. (Section Y – Y' in Fig. 1) Termination resistance is calculated after deducting the resistance of the crimped wire of 75mm in length.
	Final	6 m Ω (Max.)	
 <p style="text-align: center;">Fig. 1</p>			

Table 3 ( to be continued )

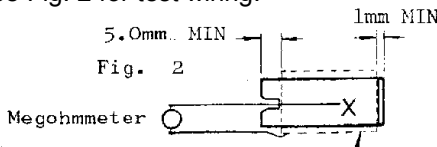
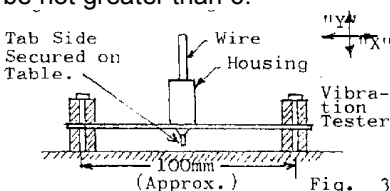
Test Item Paragraph No.	Performance Requirements	Test Method
Insulation Resistance : (Para. 7.1.7)	1,000 m Ω (Min.)	<p>Sample connector is subject to test in accordance with Test Condition "B" Test Method 302 of MIL-STD-202 by applying test potential of 500V DC ± 10% between contact and the ground. See Fig. 2 for test wiring.</p>  <p>Fig. 2</p> <p>Megohmmeter</p> <p>Wrap connector with metallic foil to cover all the surfaces.</p>
Dielectric Strength : (Para. 7.1.8)	No abnormalities, such as break-down and flashover, shall occur, and withstand test potential of 2000v AC for 1 minute.	<p>Sample connector is subject to be tested in accordance with Test Method 301 of MIL-STD-202, by applying test potential of 2000V AC (RMS) for 1 Minute, between contact and the ground. After the duration, inspect visually for evidence of insulation break-down and flashover on the housing surfaces.</p>
Temperature Rising: (Para. 7.1.9)	30°C (Max.)	<p>Contact-loaded connector is subject to be tested by applying test current of specified intensity as shown in Table 5. Measurement is done after temperature rising of connector be comes stabilized, by probing on wire crimp of contact with the use of thermocouple.</p>
Vibration (Low Frequency) (Para. 7.1.10)	<p>No electrical discontinuity greater than 1 microsecond shall occur during vibration. Termination resistance after conditioning shall be not greater than 6.</p>  <p>Fig. 3</p>	<p>Contact-loaded and series wired connector shall be tested in accordance with Test Method 201 of MIL-STD-202. Vibration shall be sweeping to reciprocate between 10-55-10 Hz. Changing a cycle a minute, in amplitude of 1.5 mm both sides, applied 2 hours each for two axial directions, 4 hours in total. After conditioning, measure for termination resistance. See Fig. 3 for test method.</p>

Table 3 ( to be continued)



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Test Item Paragraph No.	Performance Requirements		Test Method	
Humidity; (Para. 7.1.11)	After conditioning.		Sample connector is subject to be tested in accordance with Test Method 106. of MIL-STD-202, by exposing under test atmosphere for 96 hours.  <u>Test conditions :</u>  Temperature : 40°C Humidity : 90 - 95 %  After test conditioning, sample connector shall be tested for termination resistance per Para. 7.1.6, Insulation resistance per Para. 7.1.7 And dielectric strength pre Para. 7.1.8.	
	Termination Resistance :	6 mΩ (Max.)		
	Insulation Resistance :	100 mΩ (Min.)		
	Dielectric strength :  No abnormalities of electrical break-down and flashover shall be evident at test potential of 2000V AC for 1 minute.			
Thermal Shock: (Para. 7.1.12)	After conditioning.		Contact-loaded and mated connector assembly is subject to be tested in accordance with Test Condition A, Test Method 107 of MIL-STD-202, by the following sequence of temperature changing for 5 cycles.	
	Termination Resistance	6 mΩ (Max.)		
			Se-quence	Test Conditions
			1.	105°C ±5°C for 30 minutes
			2.	Room Temperature for 5 minutes
			3.	-40 ±5°C for 30 minutes
			4.	Room Temperature for 5 minutes
		After conditioning, sample connector shall be tested for termination resistance per Para. 7.1.6.		
Salt Spray: (Para. 7.1.13)	After conditioning.		Sample connector is subject to be tested in accordance with Test Method 101 of MIL-STD-202, by exposing under salt spray of the following conditions :  Concentration 5% Duration : 96 hours  After test conditioning, sample shall be rinsed by tap water and tested for termination resistance per Para. 7.1.6 and Mated/locked contact retention force per Para. 7.1.4.	
	Termination Resistance	6 mΩ (Max.)		

Table 3 (End)



7.2 Test Sequence :

Group Test Item	Para – graph No.	Test Sequence											
		1	2	3	4	5		6					
Appearance : (Confirmation of Product)	7.1.1					1		1					
Crimp Tensile Strength :	7.1.2	1											
Contact Retention Force	7.1.3		1										
Mated/Locked Contact Retention Force :	7.1.4			1									11
Connector Insertion Force :	7.1.5					2							
Connector Extraction Force :	7.1.5					3							
Termination Resistance :	7.1.6							2	4	6	8	10	
Insulation Resistance :	7.1.7					4	7						
Dielectric Strength :	7.1.8					5	8						
Temperature Rising	7.1.9				1								
Vibration (Low Frequency) :	7.1.10							3					
Humidity :	7.1.11					6			5				
Thermal Shock	7.1.12									7			
Salt Spray :	7.1.13										9		

Table 4



**8. Quality Assurance Provisions :**

**8.1 Test Conditions :**

Unless otherwise specified, all the tests shall be conducted in any combination of the following test conditions.

Temperature : 15 – 35°C

Relative Humidity : 45 – 75%

Atmospheric Pressure : 86.6 - 106.6 K P a

**8.2 Tests :**

**8.2.1 Test Specimens :**

Test Specimens employed for the tests shall be conforming to the requirements of applicable customer product drawing, and prepared in accordance with 114-61019, AMP Application Specification, Crimping Contacts for “250” Series Positive Lock Connector, by crimping on the wires of specified sizes as shown in Table 5, with the use of AMP specified applicable application tooling-Unless otherwise specified, no sample shall be reused.

**8.2.2 Number of Sample :**

More than 10 sets of samples shall be prepared for performance evaluation testing per one sample group.

**8.2.3 Applicable Wires and Test Current :**

Wires of the following sizes and test current shall be used for the tests.

Wire Size mm <sup>2</sup> (AWG)	Composition of Wire Strands and Insulation			Specification of the Wires	Test Current A (DC)
	Calculated Cross-section of Conductor (mm <sup>2</sup> )	Number of Strands	Insulation Diameter (mm)		
0.3 (#22)	0.31	12/0.18	1.5	JIS-246	3
0.5 (#20)	0.51	20/0.18	2.2	JIS-C-3406	5
0.75 (#18)	0.76	30/0.18	2.8	JIS-C-3316	7
1.25 (#16)	1.27	50/0.18	3.1	JIS-C-3316	12
2.0 (#14)	1.96	37/0.26	3.4	JIS-C-3316	15

Table 5



8.2.4 Mating Tab shape :

The mating counterpart customer tab shall be fabricated according to the specification shown in Fig.4.

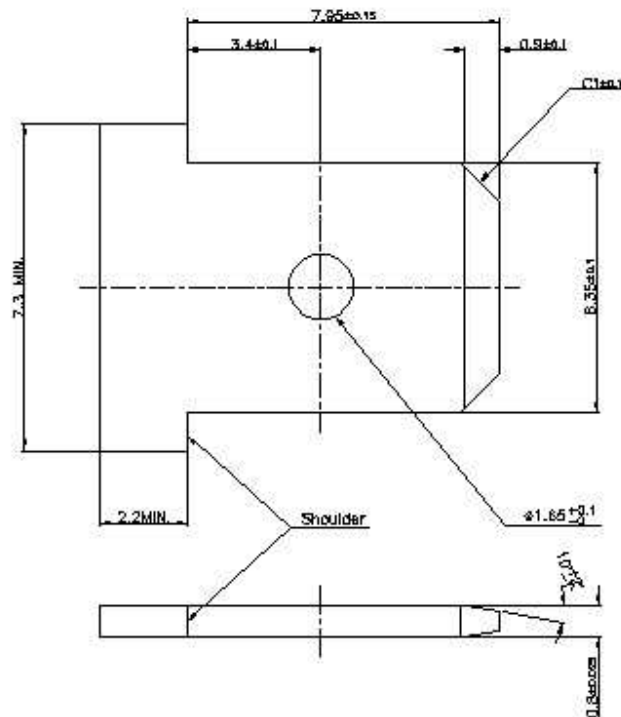


Fig.4

Note :

- 1) Material of tab shall be brass (70% copper, 30% zinc),  
Conforming to JIS H 3100 C2600P or R-  $\frac{1}{2}$ Hard
- 2) Surface finish of tab shall be plain without plating.