

108-5414

NUMBER:

Customer Release

SECURITY CLASSIFICATION:

### Product Specification

108-5414

## 2.0 mm Pitch Alignment Free Board to Board Connector

This specification may change without notice as a result of product design change and product evaluation testing.

1. Scope :

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 2.0 mm Pitch Alignment Free Board to Board Connector.

The applicable product descriptions and part number are as shown in Fig. 1 :

Product Part No.	On Taping Part No.	Tray Packing Part No.	Description
□-179394-□		□-179458-□	Tab Assembly Tine Length 3.5 mm
□-179867-□		□-179868-□	Tab Assembly Tine Length 3.1 mm with Kink
□-179395-□	□-179437-□		Rec Assembly Mating Height 9.7 mm with Positioner Boss
□-179870-□	□-179871-□		Rec Assembly Mating Height 13.0 mm with Positioner Boss

Fig. 1

					DR. 13 Jul. '94	SHEET 1 OF 11	<b>AMP</b> AMP (Japan), Ltd. Kawasaki, Japan			
					K. Asakawa					
					CHK. 13 Jul. '94	NAME	LOC	LOC	NO.	REV
					S. Kubouchi		J	A	108-5414	B
DNST.	B	Revised FJ00-4877-96	KA SK 9/23/94		APP. 13 Jul. '94	<b>2.0 mm Pitch Alignment Free Board to Board Connector</b>				
	A	Revised FJ00-1682-94	K. A S. K 6/12/94		S. Kubouchi					
	0	Prodused FJ00-0853-94	K. A S. K 7/13/94							
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## 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 Specification

501-5194 Test Report

## 2.2 Military Standard and Specifications :

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts

## 2.3 Commercial Standard and Specifications :

EIAJ (Electronic Industries Association of Japan) RCX-0102 / 101, 102 Test Method of Soldering of Surface Mounting Devices

## 3. Requirements :

## 3.1 Design and Construction :

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

## 3.2 Materials :

A. Rec Contact: Phosphor Bronze, Tin-Lead Plated (Thickness : 2  $\mu$ m minimum)B. Tab Contact: Phosphor Bronze, Tin-Plated (Thickness : 0.8  $\mu$ m minimum)

C. Rec Housing: 6 T Nylon (GF 30 %), UL 94 V-0, Beige

D. Tab Housing: PBT (GF 15 %), UL 94 V-0, White

## 3.3 Ratings :

A. Voltage Rating: 125 V AC

B. Current Rating: 1 A

C. Temperature Rating: -30 °C to +105 °C

## 3.4 Performance and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 2. All tests shall be performed in the room temperature unless otherwise specified.

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## 3.5 Test Requirements and Procedures Summary :

Para.	Test Items	Requirements	Procedures
3.5.1	Confirmation of Product	Product shall be conforming to the requirements of applicable product drawing.	Visually, dimensionally and functionally inspect.
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	35 mΩ max. (Initial) 70 mΩ max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10 mA max. at open circuit voltage of 20 mV max. Fig. 5.
3.5.3	Insulation Resistance	1000 MΩ min. (Initial) 500 MΩ min. (Final)	Measure by applying test potential between the adjacent contacts of mated connectors. MIL-STD-202, Method 302, Condition A
3.5.4	Dielectric Strength	Connector must withstand test potential of 1000 V AC for 1 minute. Current leakage must be 0.5 mA max.	Measure by applying test potential between the adjacent contacts of mated connectors. MIL-STD-202, Method 301
3.5.5	Temperature Rising vs. Current	30 °C max. under loaded specified current.	Measure temperature rising by energized current. Measure by soldering time.

Fig.2 (to be continued)

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Para.	Test Items	Requirements	Procedures
<b>Physical Requirements</b>			
3.5.6	Vibration Sinusoidal Low Frequency	No electrical discontinuity greater than 1 microsecond (s) shall occur. Termination Resistance (Low level) (Final) 70 mΩ max.	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52 mm amplitude 2 hours each of 3 mutually perpendicular planes. applied. Fig. 6. MIL-STD-202, Method 201
3.5.7	Hammering Shocks	Termination Resistance (Low Level) (Final) 70 mΩ max.	Subject mated connectors on PCB as shown in Fig. 6, under 10000 cycles of repeated hammering shocks of the condition as shown in Fig. 7, with the test current of 1 mA at 10 V DC applied. During the test, the circuit shall be monitored for fluctuation of electrical resistance. as shown in Fig. 8.
3.5.8	Physical Shock	No electrical discontinuity greater than 1 microsecond (s) shall occur. Termination Resistance (Low Level) (Final) 70 mΩ max.	Subject mated connectors to 50 G's halfsine shock pluses of 11 millisecond duration, 3 shocks in each direction applied along the 3 mutually perpendicular planes totally 18 shocks. MIL-STD-202, Method 213, Condition A
3.5.9	Connector Mating Force Unmating Force	Fig. 4	Measure the mating force and the unmating force when plug assembly and cap assembly are mated and unmated for 30 cycles at a rate of 20 mm a minute.
3.5.10	Contact Retention Force	0.5 kg min.	Apply axial load to contact
3.5.11	Durability (Repeated Mate / Unmating)	Termination Resistance (Low Level) (Final) 70 mΩ max.	Mate and unmate connectors for 30 cycles

Fig.2 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.12	Solderability	Dip contact in flux then immerse in solder bath at $235 \pm 5^\circ\text{C}$ , $5 \pm 0.5$ sec.	95% of immersed area must show no voids, pin holes.
3.5.13	Resistance to Soldering Heat	After exposing test conditioning, no deformation nor defects, that are detrimental to connector functions, shall be evident.	<p>&lt;DIP type&gt; Immerse soldering tine area of contacts in soldering tub controlled at <math>260 \pm 5^\circ\text{C}</math>, for <math>10 \pm 1</math> seconds.</p> <p>&lt;SMT type&gt; Provisional standards of EIA of Japan. RCX-0102/101 (Test Methods of soldering of surface mounting devices) Para 3.3.4 (HI-Temp. oven method) (Soldering iron method) Bit temperature : <math>300 \pm 5^\circ\text{C}</math> Application time of soldering iron : <math>3 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}</math> seconds. However, without too much pressure to the tine area.</p>
<b>Environmental Requirements</b>			
3.5.14	Thermal Shock	Termination Resistance (Low Level) (Final) $70 \text{ m}\Omega$ max.	Subject mated connectors to 5 cycles between $-55^\circ\text{C}$ and $+85^\circ\text{C}$ . MIL-STD-202, Method 107, Condition A
3.5.15	Humidity, Steady State	Insulation Resistance (Final) $100 \text{ M}\Omega$ min. Termination Resistance (Low Level) (Final) $70 \text{ m}\Omega$ max.	Subject mated connectors to steady state humidity at $40^\circ\text{C}$ and 90-95 % R.H. MIL-STD-202, Method 103, Condition B.
3.5.16	Salt Spray	Termination Resistance (Low Level) (Final) $70 \text{ m}\Omega$ max.	Subject mated connectors to 5 % salt concentration for 48 hours ; MIL-STD-202, Method 101, Condition B.

Fig. 2 (To be continued)

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Para.	Test Items	Requirements	Procedures
3.5.17	Heat Resistivity	Termination Resistance (Low Level) (Final) 70 mΩ max.	Subject mated connectors to heat resistivity at $85 \pm 2$ °C for 96 hours. per MIL-STD-202, Method 108, Condition A
3.5.18	Cold Resistivity	Termination Resistance (Low Level) (Final) 70 mΩ max.	Subject mated connectors to cold resistivity at $-25 \pm 3$ °C for 48 hours.
3.5.19	Ammonia Gas Resistivity	Termination Resistance (Low Level) (Final) 70 mΩ max. Tested sample shall show no evidence of abnormalities in appearance	Subject mated connectors to the ammonia gas atmosphere, which is generated from 400 g of 28 % ammonia solution in the desiccator in the closed chamber for 40 minutes. Temperature in the desiccator : room temperature.
3.5.20	Sulfurous Acid Gas Resistivity	Termination Resistance (Low Level) (Final) 70 mΩ max. Tested sample shall show no evidence of abnormalities in appearance	Subject mated connectors to the sulfurous acid gas resistivity at $10 \pm 3$ ppm SO <sub>2</sub> concentration at 90 % R. H. min. for 96 hours.

Note: Tested products shall be conforming to the requirements of the visual inspection without physical damage, also meeting the requirements of the additional tests specified in the sequence tests specified in Fig. 3.

Fig. 2 (End)

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3.6 Product Qualification and Requalification Tests.

Test or Examination	Test Group (a)								
	1	2	3	4	5	6	7	8	9
	Test Sequence (b)								
Examination of Product	1, 5	1	1, 5	1, 5	1, 5	1	1	1, 5	1
Termination Resistance, (Low Level)	2		2, 4	2, 4	2, 4			2, 4	
Dielectric Withstanding Voltage	4								
Insulation Resistance	3								
Temperature Rise vs Current		2							
Vibration			3						
Hammering Shocks				3					
Physical Shock					3				
Mating Force, Unmating Force						2			
Contact Retention							2		
Durability								3	
Solderability									2
Resistance to Soldering Heat									
Thermal Shock									
Humidity, Steady State									
Corrosion, Salt Spray									
Heat Resistivity									
Cold Resistivity									
Ammonia Gas Resistivity									
Sulfurous Acid Gas Resistivity									

Fig. 3 (To be Continued)

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Test or Examination	Test Group (a)							
	10	11	12	13	14	15	16	17
	Test Sequence (b)							
Examination of Product	1	1, 5	1, 6	1, 5	1, 5	1, 5	1, 5	1, 5
Termination Resistance, (Low Level)		2, 4	2, 4	2, 4	2, 4	2, 4	2, 4	2, 4
Dielectric Withstanding Voltage								
Insulation Resistance			5					
Temperature Rise vs Current								
Vibration								
Hammering Shocks								
Physical Shock								
Mating Force, Unmating Force								
Contact Retention								
Durability								
Solderability								
Resistance to Soldering Heat	2							
Thermal Shock		3						
Humidity, Steady State			3					
Corrosion, Salt Spray				3				
Heat Resistivity					3			
Cold Resistivity						3		
Ammonia Gas Resistivity							3	
Sulfurous Asid Gas Resistivity								3

- (a) See Para 4.1.A.
- (b) Numbers indicate scquence in which tests are performed.

Fig. 3 (End)

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4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification Testing

A. Sample Selection

Connector housing and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production.

Connector Mating Force / Unmating Force kg

No. of Pos.	Mating Force (max.)	Unmating Force (min.)
6	0.7	0.2
10	1.2	0.3
22	2.6	0.6
30	3.5	0.8

Fig. 4

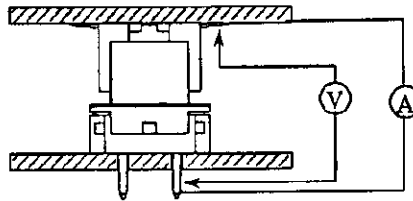


Fig. 5 Method of Termination Resistance Measuring

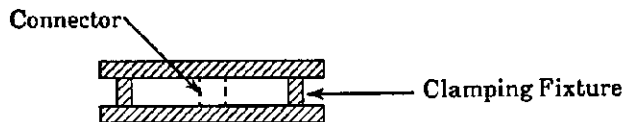


Fig. 6 Method of Connector Mounting for Vibration And Hammering shock

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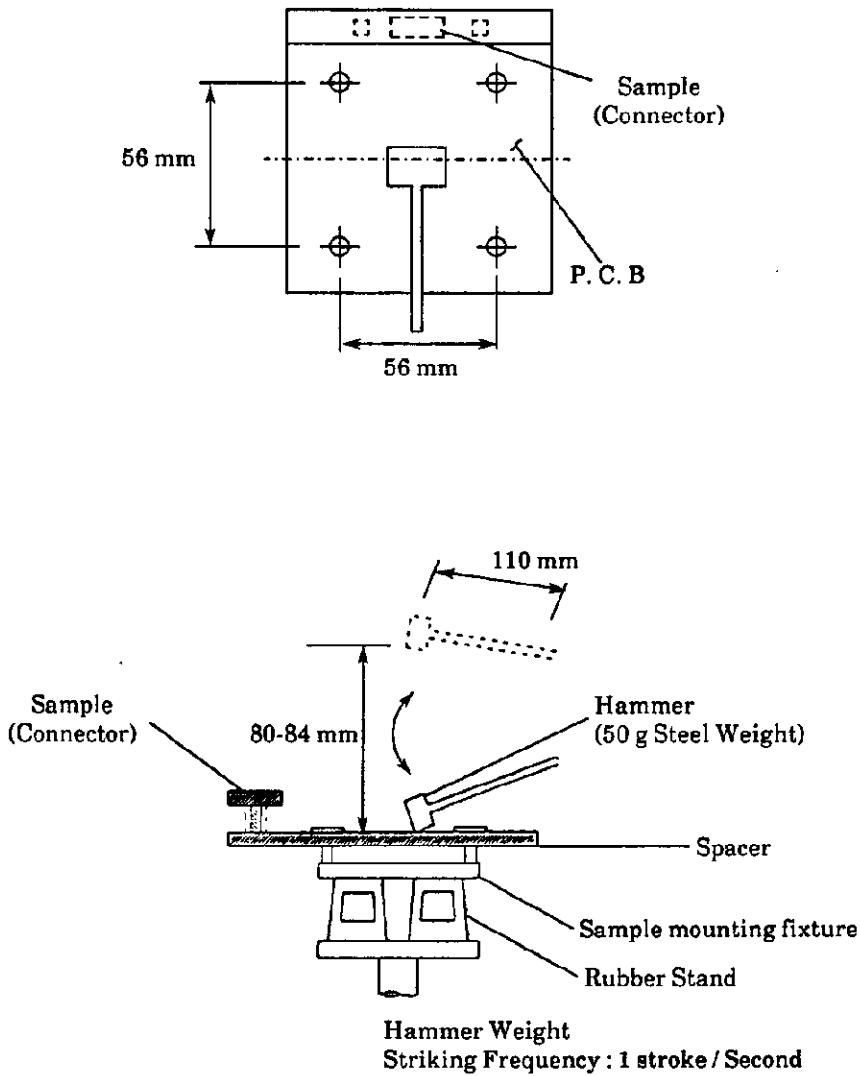


Fig. 7 Method of Hammering Shock Test

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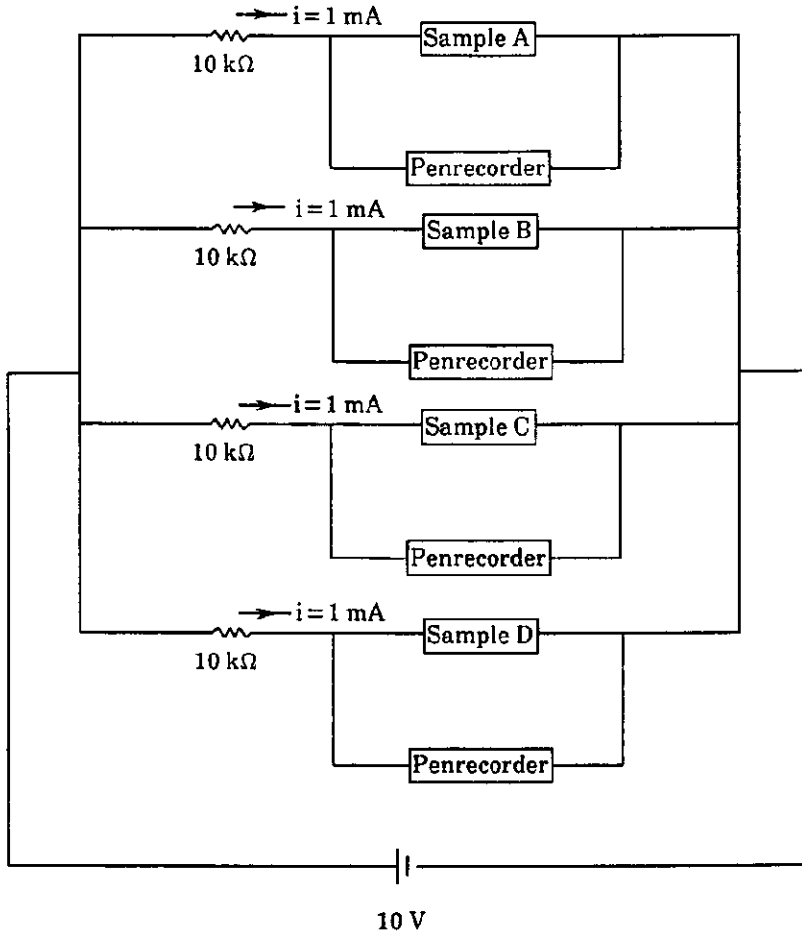


Fig. 8 Circuit of Monitoring Resistance

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