

PRODUCT SPECIFICATION

108 - 5229

CHAMP V Connector

1. Scope:

This specification covers the performance, tests and quality requirements for the AMP CHAMP V connectors with the following product numbers.

Product Number	Product Name	Specification
<input type="checkbox"/> -174021- <input type="checkbox"/>	Receptacle Assembly, Action Pin Type	PC Board Mounted
<input type="checkbox"/> -174022- <input type="checkbox"/>	Receptacle Assembly, Solder Type	PC Board Mounted
<input type="checkbox"/> -174029- <input type="checkbox"/>	Connector Assembly, Action Pin Type (Ball Locking)	PC Board Mounted
<input type="checkbox"/> -174030- <input type="checkbox"/>	Connector Assembly, Solder Type (Screw Locking)	PC Board Mounted
<input type="checkbox"/> -174031- <input type="checkbox"/>	Connector Assembly, Solder Type (Ball Locking)	PC Board Mounted
<input type="checkbox"/> -174032- <input type="checkbox"/>	Connector Assembly, Solder Type (Screw Latch Locking)	PC Board Mounted
<input type="checkbox"/> -174155- <input type="checkbox"/>	Plug Assembly, Action Type	PC Board Mounted
<input type="checkbox"/> -174158- <input type="checkbox"/>	Plug Assembly, Soldering Type	PC Board Mounted

- (a) The receptacle assembly and plug assembly consist of a base housing with molded contacts and a receptacle housing. The connector assembly consists of a receptacle assembly and the appropriate hardware.
- (b) These connectors can be mated with all other AMP CHAMP connectors.

		DR <i>[Signature]</i>		AMP		AMP (Japan), Ltd. TOKYO, JAPAN	
		10-20-78		LOC J A		PID 108-5229	
B Revised RFA-1217		1/18		SHEET		CHAMP V Connector	
A Revised RFA-1023		1/22		1 OF 11			
LTR REVISION RECORD		DR	CHK	DATE			

NUMBER 108 29
 AMP SECURITY CLASSIFICATION
 Customer Release

PRINT LIST

2. Applicable Documents:

The following documents form a part of this specification to the extent specified herein.

- a. MIL-STD-202E Test Methods for Electronic and Electric Component Parts
- b. MIL-G-45204 Electrodeposited Gold Plating
- c. QQ-N-290 Electrodeposited Nickel Plating
- d. JIS G 4309 Stainless Steel Wires


3. Material, Finish and Appearance:

3.1 Contacts:

- a. Material: Phosphor bronze
- b. Finish: Nickel underplate : 1.3µm min. thick
 Gold plating 0.76µm thick min. for contact area only
 Tin-lead plating for tyne area of contact post:
 1 - 2.5µm thick

3.2 Base Housing:

- a. Material: Polyphenylene sulfide (PPS) resin
- b. Color: Black
- c. Flame Retardant Grade: UL 94V-0

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
<u>2</u> OF <u>11</u>	LOC J	A	NO 108-5229	REV. B
NAME CHAMP V Connector				

3.3 Receptacle Housing and Plug Housing:

- a. Material: 15% glass-filled polybutylene terephthalate (PBT) resin
- b. Flame Retardant Grade: UL 94V-0

3.4 Screw Mounting Brackets:

- a. Material: Carbon steel
- b. Finish: Bright Zinc Plating

3.5 Retension Legs:

- a. Material: Brass
- a. Finish: Bright tin-lead plating 0.8µm thick min. over copper underplate 0.5µm thick min.

3.6 Pan Head Machine Screws:


- a. Material: Brass
- b. Finish: Nickel plating

3.7 Bail Clip Latch:

- a. Material: Stainless steel
- b. Finish: Passivated

3.8 Washers:

- a. Material: Phosphor bronze
- b. Finish: Nickel plating

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
<u>3</u> OF <u>11</u>	LOC	NO	REV.	
	J	A	108-5229	
NAME CHAMP V Connector				

3.9 Nuts:

- a. Material: Brass
- b. Finish : Nickel plating

3.10 Connector Appearance:

No damages, cracks, deformation, blisters, dirt or burrs must be evident which are detrimental to connector functions and merchandising appearance value.


4. Design Features, Construction and Dimensions:

Product design features, construction and dimensions shall conform to the applicable product drawing(s).

5. Performance:

5.1 Ratings:

- (1) Current : 1.0 A max. per contact
- (2) Voltage : 250 VAC
- (3) Operating temperature range: -65° to +75°C


SHEET				AMP (Japan), Ltd. TOKYO, JAPAN	
4 OF 11		LOC	A	NO	108-5229
		J			REV. B
NAME CHAMP V Connector					

5.2 General Performance Characteristics

Connectors shall be designed to meet all the general performance requirements specified in Fig. 1.

Item No.	Test Item	Specified Requirements	Paragraph No. for Test Method
5.2.1	Low Level Termination Resistance	32 mΩ max.	7.1
5.2.2	Insulation Resistance	1,000 MΩ min.	7.2
5.2.3	Dielectric Strength	No insulation break-down nor flashover shall occur.	7.3
5.2.4	Connector Insertion/Extraction Force	Insertion Force: 11.5 kg max. Extraction Force: 1.0 kg min.	7.4
5.2.5	Repeated Insertion/Extraction	Appearance: No physical abnormalities shall occur. Termination Resistance, Low Level: 32mΩ max. Insertion/Extraction Force The requirements per Para. 5.2.4 shall be met.	7.5
5.2.6	Vibration, High Frequency:	No electrical discontinuity greater than 1 μsec. shall occur during test. Appearance: No physical abnormalities shall occur.	
5.2.7	Humidity-Temperature Cycling	Appearance: No physical abnormalities shall occur. Termination Resistance: Low Level: 32mΩ max. Insulation Resistance: 1,000MΩ min. Dielectric Strength: The requirements per Para. 6.2.4 shall be met.	7.7

Fig. 1 (To be continued)

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
<u>5</u> OF <u>11</u>	LOC J	A	NO 108-5229	REV. B
NAME CHAMP V Connector				

Item No.	Test Item	Specified Requirements	Paragraph No. for Test Method
5.2.8	Thermal Shock	Appearance: No physical abnormalities shall occur. Termination Resistance, Low Level: 32mΩ max.	7.8
5.2.9	Sulfurous Acid Gas ResistivityL	Appearance: No remarkable corrosion shall be evident. Termination Resistance, Low Level: 32mΩ max.	7.9
5.2.10	Heat Resistance	Appearance: No physical abnormalities shall occur. Termination Resistance, Low Level: 32mΩ max.	7.10
5.2.11	Insertion Force ACTION PIN	22.7 kg max.	7.11
5.2.12	Retention Force, ACTION PIN	2.5 kg min.	7.12
5.2.13	Solderability	More than 95% of tested area shall appear with fresh and sufficiently working coverage of wet solder.	7.13
5.2.14	Soldering Heat Resistivity:	No deformation nor defect which is detrimental to connector functions shall be evident.	7.14

Fig. 1 (End)

SHEET		AMP		AMP (Japan), Ltd. TOKYO, JAPAN	
6 OF 11		LOC	NO	REV.	
		J	A	108-5229	
NAME					
CHAMP V Connector					

108-5229

AMP SECURITY DOCUMENTS
CLASSIFICATION Release

6. Test Conditions:

6.1 Environmental Conditions:

Unless otherwise specified, the performance tests shall be performed under the following environmental conditions.

Temperature: 15 to 35°C

Relative Humidity: 45 to 75%

Atmospheric Pressure: 650 to 800 mmHg

6.2 Samples Tested:

6.2.1 Before undergoing the specified tests, the samples shall be verified for conformance with the applicable product drawings.


6.2.2 The other connectors with which these samples are to be engaged shall be standard AMP CHAMP connectors (E slot type) that conform with the appropriate specifications and product drawing.

6.2.3 Unless otherwise specified, any tested samples shall not be reused for the tests.

7. Test Procedure:

7.1 Low Level Termination Resistance:

Subject mated contact assembled in housing mounted to PC board to maximum 50 mVDC open circuit at 50 mA maximum for obtaining low level termination resistance by calculation from the measured value of millivolt drop method.

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN
7 OF 11	LOC J A	NO 108-5229	REV B
NAME CHAMP V Connector			

7.2 Insulation Resistance (MIL-STD-202E, 302B):

Test between the adjacent contacts of the unmated connector assembly.

7.3 Dielectric Strength (MIL-STD-202E, 301):

Apply 1.000 VAC of test potential between the adjacent contacts of the unmated connector for 1 minute and observe dielectric breakdown and surface discharge.

7.4 Connector Insertion/Extraction Force:

Securely fix CHAMP V connector and its mating counterpart, standard CHAMP connector on the tensile testing machine so that they mate and unmate. Measure the force required to insert and extract by operating the head to travel with the speed at a rate of 100mm approximately a minute.

7.5 Repeated Insertion/Extraction:


Subject connectors to 200 cycles of insertion/withdrawal in the same manner as specified in Para. 7.4.

7.6 High Frequency Vibration (MIL-STD-202E, 204C, Condition B):

Subject mated pair of connectors with all the contacts series wired to the sweeping vibration. While testing, monitor the circuit for discontinuity greater than 1 microsecond taking place, by applying test current of 100mA to the circuit.

7.7 Humidity-Temperature Cycling (MIL-STD-202, 106D)

Mated pair of connectors shall be exposed under the test atmosphere according to the specified test method.

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
<u>8</u> OF <u>11</u>	LOG	NO	108-5229	REV. B
NAME		CHAMP V Connector		

7.8 Thermal Shock (MIL-STD-202E, 107D, Condition A) :

Test mated connectors.

7.9 Sulfurous Acid Gas Resistivity:

Test mated connectors according to the following conditions.

Gas Concentration : 10 ± 3 ppm
 Relative Humidity : 90% min.
 Temperature : Room temperature
 Test Period : 96 hr.

7.10 Heat Resistance (MIL-STD-202E, 108A, Condition A) :

Test mated connectors at $100 \pm 2^\circ\text{C}$ and for 96 hours.

7.11 Action Pin Insertion Force:


Insert each position of the action pins individually and vertically into the "test PC board for E type" specified in Fig. 2 and measure the force required to insert the action pin by using the force gauge.

7.12 Action Pin Retention Force :

Using a pressure gauge, press each position of the action pins inserted into the "test PC board for E type" specified in Fig. 2 individually. Load is to be applied vertically.

7.13 Solderability (MIL-STD-202, Test Method 203C):

Dip the tain up to 1.5 mm from the housing bottom into solder bath at $230 \pm 5^\circ\text{C}$ and for 5 seconds.

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
9 OF 11	LOC	A	NO 108-5229	REV. B
NAME CHAMP V Connector				

7.14 Solder Dip Resistance (MIL-STD-202, Test Method 210, Condition B):

Dip the tain up to 1.5 mm from the housing between into solder bath at $260 \pm 5^\circ\text{C}$ and for 10 ± 1 seconds.

Item No.	Test Item	Test Group No.							
		1	2	3	4	5	6	7	8
3.10	Aconnector Appearance	①	①⑨	①⑤		①	①	①	①
5.2.1	Low Level Termination Resistance	③⑦⑨⑪	②③⑧	②④		②③	②⑤		
5.2.2	Insulation Resistance	④⑫							
5.2.3	Dielectric Strength	⑤⑬							
5.2.4	Connector Insertion/Extraction Force	②	③③						
5.2.5	Repeated Insertion/Extraction		④						
5.2.6	High Frequency Vibration	⑧							
5.2.7	Humidity-Temperature Cycling	⑩	⑦						
5.2.8	Thermal Shock	⑥			③				
5.2.9	Sulfurous Acid Gas Resistivity			③					
5.2.10	Heat resistance						③		
5.2.11	Insertion Force, ACTION PIN				①				
5.2.12	Retention Force, ACTION PIN					④	④		
5.2.13	Solderability							②	
5.2.14	Solder Dip Resistance								②

Fig. 2

NOTES:

- (1) Individual tests are to be carried out in the sequence of the encircled numbers for each group as shown in Fig. 2.
 - (2) The tests for Groups 1 through 3 shall apply to the action pin and solder type connectors.
 - (3) The test for Group 4 shall apply only to the action pins.
 - (4) The action pin retention test for Groups 5 and 6 shall apply to the action pin type connectors.
- The tests for Groups 7 and 8 shall apply to the solder type connectors.

SHEET	AMP		AMP (Japan), Ltd. TOKYO, JAPAN	
10 OF 11	LOC J	A	NO 108-5229	REV. B
NAME CHAMP V Connector				

Each group shall have 4 sets of connectors as test samples. The low level termination resistance shall be measured from the read values of 50 connectors sampled based on a random sampling method.

Note:
 Termination resistance is obtained by calculation after deducting the resistance value of the 75mm long wire used for the circuit termination.

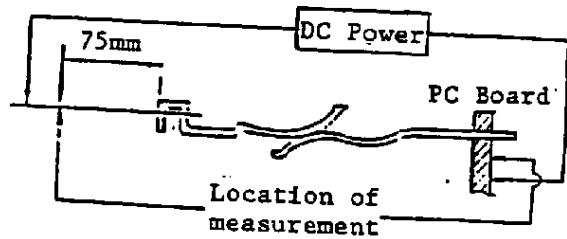


Fig. 3 Termination Resistance Measuring Points

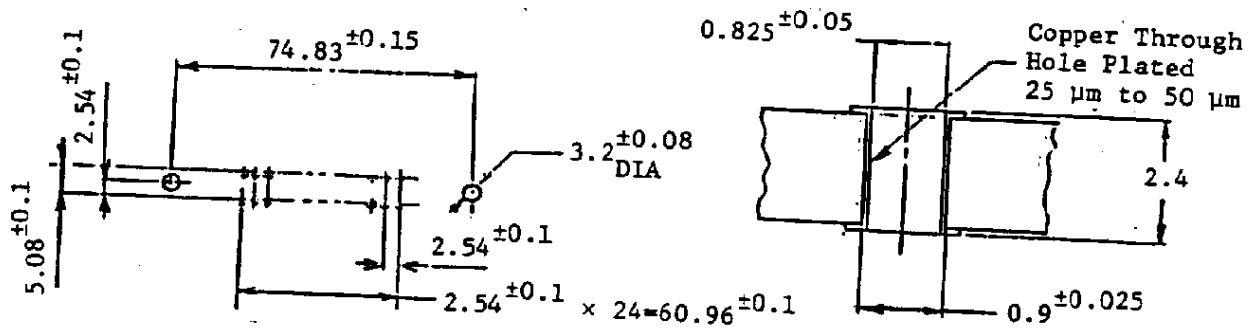


Fig. 4 Printed Circuit Board for Testing (For Press Fitting) Unit: mm

This specification may be subject to change according to the results of the evaluation tests on mass-produced connectors.

SHEET	AMP		AMP (Japan), Ltd. TOKYO, JAPAN	
11 OF 11	LOG	NO	108-5229	REV.
	J	A		B
NAME CHAMP V Connector				