

REVISION: JUNE 10, 1987

108-5238  
Product Specification

\*\*\*\*\*  
\*\* PRELIMINARY \*\*  
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Shielded MINI-MITE Connector

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

1. Scope:

This specification covers requirements for product performance as to counter-EMI products (Table 1) of the Shielded Mini-Mite Connector (wire-to-board).

Table 1

Product No.	Product Name	Remarks
174340-□	Plug Connector Kit	Wire side
174225-□	Horizontal Type Cap Header	Board
174339-□	Vertical Type Cap Header	

2. Type of Products:

Connectors of this product line are designed for wire-to-board mass termination. Further, shield effect is applied for prevention of EMI.

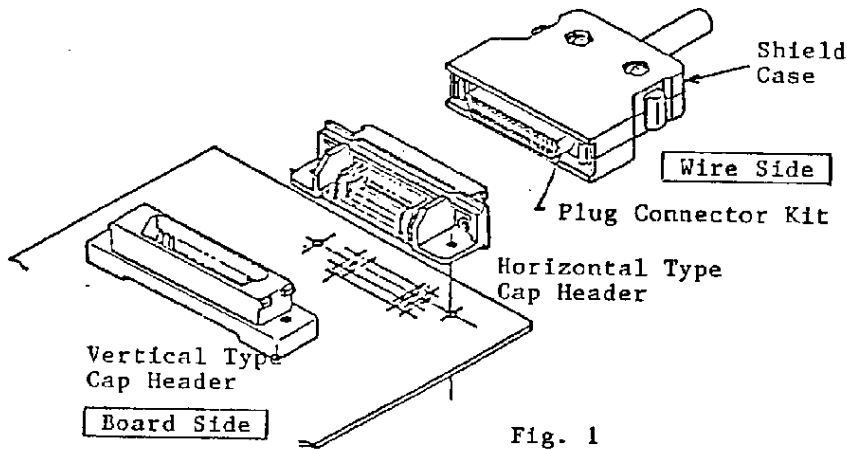


Fig. 1

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						108-5238	
				SHEET	NAME		
				1 OF 9	Product Specification (Tentative) Shielded Mini-Mite Connector		
LTR	REVISION RECORD	DR	CHK	DATE			

NUMBER 108-5238  
 Customer Release  
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3. Product Specifications:

3.1 Product Design Feature, Construction and Dimensions

The product structure, shape and dimensions shall conform to requirements shown on applicable drawings, unless otherwise specified below.


- (1) Number of Positions ----- 20, 28, 36 and 50 Positions, in 4 types
- (2) Pitch and Row ----- Engaging Side: 1.27 mm pitch x  
2.54 mm in 2 rows  
Board Mount : 2.54 mm pitch x  
Side 1.905 mm in zigzag of  
4 rows
- (3) Cap Header Type ----- Horizontal & Vertical Types/Panel &  
Board Mount Types
- (4) Mounting on Panel  
& Board ----- Screw Mount (M2.5 Screws)
- (5) Applicable Panel ----- 1.6 mm max.
- (6) Applicable Board ----- Thickness: 0.8 - 1.6 mm. Solder-Resistance  
Treatment to be applied on soldering face.
- (7) Applicable Wire Size ----- To be specified in Table 2.

Table 2

Wire Size	Conductor (Tin-plated mild copper wire)		Insulation	
	Composition	Outside Diameter	Outside Diameter	Material
AWG#28	7/0.127	0.38 mm	0.5 ~ 0.9	PVC or equivalent
AWG#30	7/0.1	0.3 mm		

3.2 Material and Finish:

- (1) Receptacle Contact      Material: Phosphor Bronze  
Finish: 1.3 μm min. thick nickel underplate all over  
0.2 μm min. thick gold-plated for contact  
area only, and 1.0 μm min. thick solder-  
plated for piercing area
- (2) Post Contact      Material: Phosphor Bronze  
Finish: 1.3 μm min. thick nickel underplate all over  
0.2 μm min. thick gold-plated for contact  
area only, and 1.0 μm min. thick solder-  
plated for tyne area only
- (3) Plug, Cap, Cover Housing and Tyne Plate      Material: Glass-filled Thermoplastic, Polyester  
UL Flame Retardant Grade: UL94V-0  
Color: Black

SHEET				AMP (Japan), Ltd. TOKYO, JAPAN	
2 OF 9		LOC J	A	NO 108-5238	REV.
NAME Product Specification (Tentative) Shielded Mini-Mite Connector					

- (4) Plug Metal Shell...Material: Cold Rolled Steel Sheet  
Finish: Bright-tin Plating over Copper Underplate
- (5) Cap Metal Shell...Material: Zinc Die Cast  
Finish: Nickel-plated over Copper Underplate
- (6) Rocking Spring.....Material: Stainless Steel
- (7) Shielded Case.....Material: Molded ABS Resin, and Zinc Die Cast  
Finish: Nickel-plated over Copper Underplate

3.3 Appearance:

The connectors shall be free from scratches, cracking, deformation, blister, dirt and burrs, that are detrimental to connector functions and merchandising value.

4. Product Performance

4.1 Rating

- (1) Rated Voltage: DC 100V
- (2) Rated Current: 1A max.
- (3) Operating Temperature Range: -55°C ~ +85°C

4.2 Quality Assurance Provisions:


4.2.1 Test Environments:

The performance test shall be made on the environmental conditions listed below, unless otherwise specified.

Temperature : 15 ~ 35°C  
Relative Humidity : 45 ~ 75%  
Atmospheric Pressure: 650 ~ 800 mmHg

4.2.2 Test Samples:

- (1) The product samples to be used at the performance test shall conform to applicable product drawings.
- (2) Wires to be used for termination shall conform to those specified in Para. 3.1 (7) and applicable tools shall be used for termination.
- (3) No test sample shall be reused in the test, unless otherwise specified.
- (4) Shield case is excluded from the testing items.

SHEET				AMP (Japan), Ltd. TOKYO, JAPAN	
3 OF 9		LOC	NO	REV.	
		J	A	108-5238	
NAME Product Specification (Tentative) Shielded Mini-Mite Connector					


AMP SECURITY CLASSIFICATION: Customer Release NUMBER 108-5238

4.3 Electrical Performance:


Test Item	Requirements	Test Method
4.3.1 Low-level Termination Resistance	Initial: 20 mΩ max. After test: 30 mΩ max.	To be measured by using open circuit voltage of 50 mV max. with closed circuit current of 50 mA max. flowing through the test circuit shown in Fig. 2.
4.3.2 Insulation Resistance	1000 MΩ	Engage connectors, and measure resistance between adjacent connectors per Condition B (500 V + 10%), Test Method 302 of MIL-STD-202.
4.3.3 Dielectric Strength	No abnormalities such as insulation break-down or flash-over shall take place during the test.	Engage connectors, and apply AC 500 V (RMS) between the adjacent contacts for 1 min. per Test Method 301 of MIL-STD-202.
4.3.4 Temperature Rising	30°C max.	After all the contacts series-wired, mate connectors, and measure temperature rising at the points shown in Fig. 2 by thermocouple method. Use test current of 1 A and from the measured value, deduct the room temperature.

4.4 Physical Performance:

4.4.1 Connector Insertion/Extraction Force	# of Pos.	Insertion	Extraction	Attach plug and cap assemblies properly to tensile tester, insert and extract at the rate of speed of 100 mm/min., and read the insertion and extraction forces required.  *The value regarding grounding indents is to be separately specified.
	20	2.0 Kg max.	0.5 Kg min.	
	28	3.0 Kg max.	0.6 Kg min.	
	36	5.0 Kg max.	0.8 Kg min.	
	50	6.0 Kg max.	1.0 Kg min.	

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
4 OF 9	LOC	A	NO	REV.
			108-5238	
NAME Product Specification (Tentative) Shielded Mini-Mite Connector				

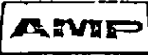
Test Item	Requirements	Test Method
4.4.2 Durability:	(Appearance) No physical problem tolerated. (Low-level Termination Resistance) To meet 4.3.1. (Insertion/Extraction Force) To meet 4.4.1.	Repeat insertion and extraction for 500 cycles in the same manner as specified in Para. 4.4.1.
4.4.3 High Frequency Vibration	No electrical discontinuity greater than 1 microsecond shall take place during the test.  (Low-level Termination Resistance) To meet 4.3.1. (Appearance) No physical problem tolerated.	Engage the connectors with all the contacts series-wired, apply test vibration changing to reciprocate 10-500-10Hz one cycle every 15 min. to the connector fixed on the jig. Maximum amplitude shall be 1.52 mm both sides, 10G at the peak, as specified in Test Condition A, Test Method 204 of MIL-STD-202. Vibration shall be applied to three axial directions 3 hours each, totally 9 hours.
4.4.4 Physical Shocks:	No electrical discontinuity greater than 1 microsecond shall take place during the test.  (Low-level Termination Resistance) To meet 4.3.1. (Appearance) No physical problem tolerated.	Engage the connectors with all the contacts series-wired, and applying test current of 100 mA to the circuit, test in accordance with Test Condition C, Test Method 213 of MIL-STD-202. The vibration shall be: Standard holding time: 6 msec. Max. value : 100 g's Waveform : Semi-sine waveform  Directions and Number : 3 Drops each of Cycles: in X, Y and Z (total 18 times)

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN
5 OF 9	LOC J	NO A	108-5238
NAME Product Specification (Tentative) Shielded Mini-Mite Connector			


Test Item	Requirements	Test Method
4.4.5 Soldering Heat Resistivity	To be free from such physical problems as play in contact, cracking and deformation of housing.	Mount connector on the board, and dip in a molten solder bath so that the underside of the board is held in the bath.  Molten solder temperature : $260 \pm 5^\circ\text{C}$ Dipping time : 3 sec.

4.5 Environment Resistivity

4.5.1 Humidity Resistance	(Insulation Resistance) 500 M min. (Dielectric Strength) To meet 4.3.3. (Low-level Termination Resistance) To meet 4.3.1.	Engage connectors, and test per Test Method 106D of MIL-STD-202. Test cycle (24 hrs.): $25^\circ\text{C} + 65^\circ\text{C} + 25^\circ\text{C} + 65^\circ\text{C} + 25^\circ\text{C}$ under relative humidity of 80 ~ 98%. Repeat this test cycle 10 times.															
4.5.2 Thermal Shock	(Low-level Termination Resistance) To meet 4.3.1. (Appearance) No physical problem tolerated.	Engage connectors, and test 5 cycles on end per Condition A (see table below), Test Method 107D of MIL-STD-202. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temp. (<math>^\circ\text{C}</math>)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 <math>\begin{matrix} +0 \\ -3 \end{matrix}</math></td> <td>30</td> </tr> <tr> <td>2</td> <td>25 <math>\begin{matrix} +10 \\ -5 \end{matrix}</math></td> <td>5 Max.</td> </tr> <tr> <td>3</td> <td>85 <math>\begin{matrix} +3 \\ -0 \end{matrix}</math></td> <td>30</td> </tr> <tr> <td>4</td> <td>25 <math>\begin{matrix} +10 \\ -5 \end{matrix}</math></td> <td>5 Max.</td> </tr> </tbody> </table>	Step	Temp. ( $^\circ\text{C}$ )	Time (min.)	1	-55 $\begin{matrix} +0 \\ -3 \end{matrix}$	30	2	25 $\begin{matrix} +10 \\ -5 \end{matrix}$	5 Max.	3	85 $\begin{matrix} +3 \\ -0 \end{matrix}$	30	4	25 $\begin{matrix} +10 \\ -5 \end{matrix}$	5 Max.
Step	Temp. ( $^\circ\text{C}$ )	Time (min.)															
1	-55 $\begin{matrix} +0 \\ -3 \end{matrix}$	30															
2	25 $\begin{matrix} +10 \\ -5 \end{matrix}$	5 Max.															
3	85 $\begin{matrix} +3 \\ -0 \end{matrix}$	30															
4	25 $\begin{matrix} +10 \\ -5 \end{matrix}$	5 Max.															
4.5.3 Heat Aging	(Low-level Termination Resistance) To meet 4.3.1. (Appearance) No physical problem tolerated.	Engage connectors, and test for 250 hrs. at $85 \pm 2^\circ\text{C}$ (Condition B) per Test Method 108A of MIL-STD-202.															

SHEET			AMP (Japan), Ltd. TOKYO, JAPAN
6 OF 9	LOC	NO	REV.
	J   A	108-5238	
NAME Product Specification (Tentative) Shielded Mini-Mite Connector			

Test Item	Requirements	Test Method
4.5.4 SO <sub>2</sub>	(Low-level Termination Resistance) To meet 4.3.1.	Engage connectors, and expose to SO <sub>2</sub> on following conditions. SO <sub>2</sub> concentration : 10 ± 3 ppm Relative humidity : 90% min. Temperature : Room temperature : 48 hours


SHEET			AMP (Japan), Ltd. TOKYO, JAPAN
7 OF 9	LOC J	NO A	REV. 108-5238
NAME Product Specification (Tentative) Shielded Mini-Mite Connector			

5. Test Sequence:

All the tests shall be performed in accordance with the test sequence specified below.

Test Item	Item No.	Test Group								
		1	2	3	4	5	6	7	8	9
Appearance	3.3	1	1	1	1	1	1	1	1	1
Low-level Termination Resistance (Initial)	4.3.1	3	2	2	2	2	2			
Insulation Resistance (Initial)	4.3.2							2		
Dielectric Strength (Initial)	4.3.3							3		
Temperature Rising	4.3.4								2	
Connector Insertion/Extraction Force	4.4.1	2								
Durability	4.4.2	4								
High Frequency Vibration	4.4.3						3			
Physical Shock	4.4.4						4			
Soldering Heat Resistivity	4.4.5									2
Humidity Resistance	4.5.1		3					4		
Thermal Shock	4.5.2			3						
Heat Aging	4.5.3				3					
SO <sub>2</sub>	4.5.4					3				
Low-level Termination Resistance (Final)	4.3.1	6	4	4	4	4	5			
Insulation Resistance (Final)	4.3.2							5		
Dielectric Strength (Final)	4.3.3							6		
Connector Insertion/Extraction Force (End)	4.4.1	5								
Appearance (End)	3.3		5	5	5		6	7	3	3
No. of Test Samples		5	3	3	3	3	3	3	1	1

(Note) 1. To be tested in groups in sequence indicated by encircled figure.

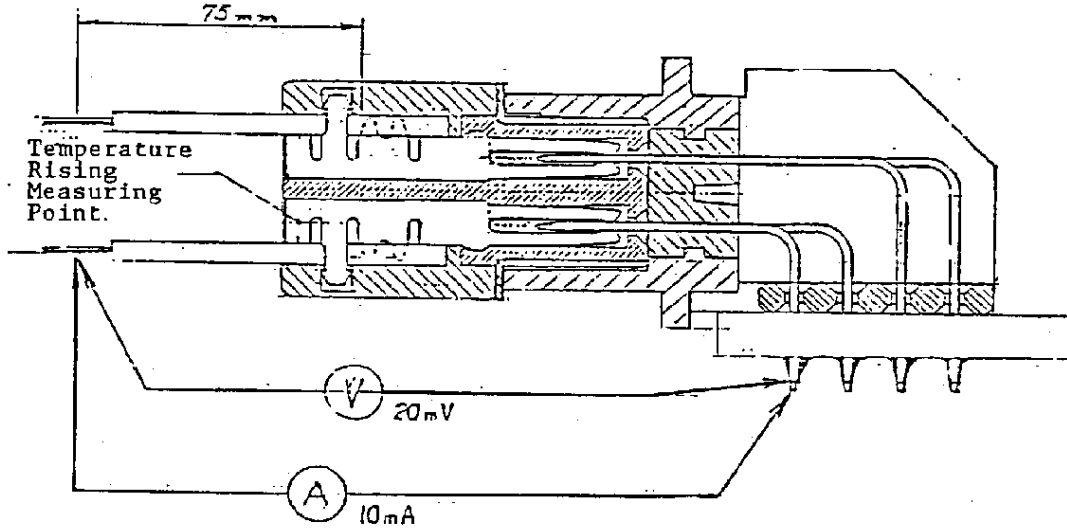
SHEET			AMP (Japan), Ltd. TOKYO, JAPAN	
8 OF 9	LOC	NO	REV.	
	J	A	108-5238	
NAME Product Specification (Tentative) Shielded Mini-Mite Connector				

NUMBER  
108-5238

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[Measurement of Low-level Resistance]



Low-level Resistance = Measured Reading - Wire Resistance (75 mm)

Fig. 2

SHEET	<b>AMP</b>		AMP (Japan), Ltd. TOKYO, JAPAN
9 OF 9	LOC J   A	NO 108-5238	REV.
NAME Project Specification (Tentative) Shielded Mini-Mite Connector			