NUMBER: 108-5238-1

SECURITY CLASSIFICATION: Customer Release

# Product Specification

## 108-5238-1

## AMPLIMITE 050 SERIES II CONNECTOR TYPE B

1. Scope :

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of counter -EMI products (Fig. 1) of AMPLIMITE 050 Series II connector type B .

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

| Product No. | Product Name | Remarks |
|---|---|---|
| ☐-174340-☐ | Plug Connector Kit | Wire Side (AWG #28) |
| ☐-175705-☐ | Plug Connector Kit | Wire Side (AWG #30) |
| ☐-174225-☐ | Horizontal Type Cap Header | M 2.5 Screw |
| ☐-174341-☐ | Horizontal Type Cap Header | w/Retention Leg |
| ☐-175714-☐ | Plug Connector Kit | Wire Side (AWG #28) |
| ☐-175644-☐ | Plug Connector Kit | Wire Side (AWG #28) for Flat Ribbon Cable |
| ☐-174339-☐ | Vertical Type Cap Header | M 2.5 Screw |

Fig. 1

| LTR | REVISION RECORD | DR | CHK | DATE |
|---|---|---|---|---|
| G | Revised RFA-1805 | | RN | 6/11'91 |

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2. Type of the Products :

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

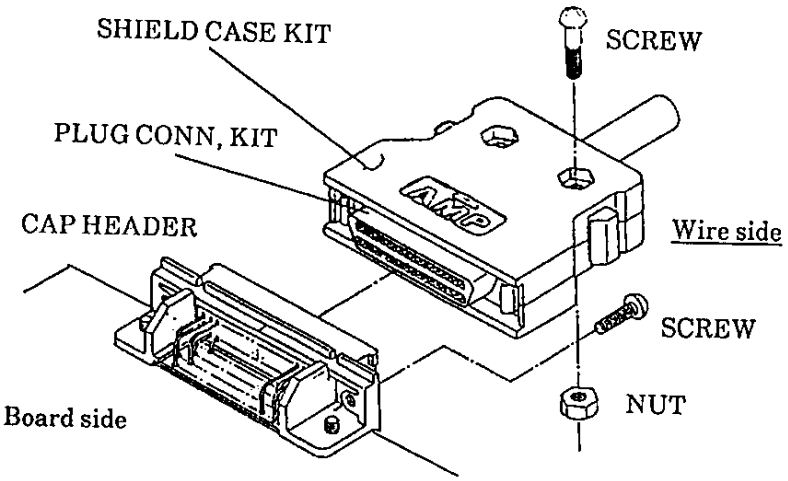


Fig. 2

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, 50, 68 Pos. in 5 Types |
| (2) Pitch and Row | Engaging Side : 1.27 mm pitch × 2.54 mm in 2 rows |
| | Board Mount Side : 2.54 mm pitch × 1.905 mm in zigzag of 4 rows |
| (3) Cap Header Type | Horizontal / Panel & Board Mount Type |
| (4) Mounting on Panel & Board | Screw Mount (M 2.5 Screws) / Self Mount (Retention Leg) |
| (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 Fig. 3. |

| Wire Size | Conductor (Tin-plated mild copper wire) | | Insulation | | Remarks |
|---|---|---|---|---|---|
| | Composition | Outside Diameter | Outside Diameter | Material | |
| AWG #28 | 7/0.127 | 0.38 | 0.5~0.75 | PVC or equivalent | Discrete |
| AWG #30 | 7/0.1 | 0.3 | | | |
| AWG #28 | 7/0.127 | 0.38 | 1.0 MAX | | Flat Ribbon |

Fig. 3

3.2 Material and Finish :

(1) Receptacle Contact : Material : Phosphor Bronze

Finish : 1.0 $\mu$m min. thick nickel underplate all over 0.2 $\mu$m or 0.76 $\mu$m min. thick gold-plated for contact area only, and 1.0 $\mu$m min. thick solder-plated for termination area.

(2) Post Contact : Material : Phosphor Bronze

Finish : 1.0 m min. thick nickel underplate all over 0.2 $\mu$m or 0.76 $\mu$m min. thick gold-plated for contact area only, and 1.0 $\mu$m 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 : UL 94V-0

Color : Black / Gray

(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-plasted over Copper Underplate

(6) Locking Spring : Material : Stainless Steel

(7) Shield 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 : AC 100 V

(2) Rated Current : 1 A max.

(3) Operating Temperature Range : $-55\,^{\circ}C \sim +85\,^{\circ}C$

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.

4.3 Electrical Performance :

| Para. | Test Items | Requirements | Procedures |
|---|---|---|---|
| | Electrical Requirements | | |
| 4.3.1 | Termination Resistance (Low Level) | Initial : 20 mΩ max.<br>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. 6. |
| 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. |

Fig. 4 (To be continued)

| Para. | Test Items | Requirements | Procedures |
|---|---|---|---|
| 4.3.3 | Dielectric Strength | No abnormalities such as insulation break-down or flashover 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 vs. Current | 30 °C max. | After all the contacts serieswired, mate connectors, and measure temperature rising at the points shown in Fig. 6 by thermocouple method. Use test current of 1 A and from the measured value, deduct the room temperature. |
| 4.4.1 | 4.4.1 Connectpor Insertion / Extraction Force | # of Pos. / Insertion / Extraction:<br>20 — 2.0 kg max. — 0.5 kg min.<br>28 — 3.0 kg max. — 0.6 kg min.<br>36 — 5.0 kg max. — 0.8 kg min.<br>50 — 6.0 kg max. — 1.0 kg min.<br>68 — 7.5 kg max. — 1.5 kg min.<br>96 — 10.5 kg max. — 2.0 kg min. | 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.<br>* The value regarding grounding indents is to be separately specified. |
| 4.4.2 | Durability (Repeated Mate/Unmating) | (Appearance) No physical problem tolerated.<br>(Low-level Termination Resistance) To meet 4.3.1.<br>(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. |

Fig. 4 (To be continued)

| Para. | Test Items | Requirements | Procedures |
|---|---|---|---|
| 4.4.3 | Vibration Sinusoidal High Frequency | 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 10-500-10 Hz one cycle every 15 min. to the connector fixed on the jig. Maximum amplitude shall be 1.52 mm both sides, 10 G 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 Shock | 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 A, Test Method 213 of MIL-STD-202. The vibration shall be : Standard<br>holding time : 6 mesc.<br>Max. value : 50 g's<br>Waveform : Semi-sine waveform<br>Directions and Number of Cycles :<br>3 Drops each in X, Y and Z (total 18 times) |
| 4.4.5 | Resistance to Soldering Heat | 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.<br>Molten solder<br>Temperature : 260±5 °C<br>Dipping time : 3 sec. |

Fig. 4 (to be continued)

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| Para. | Test Items | Requirements | Procedures |
|---|---|---|---|
| | Environmental Requirements | | |
| 4.5.1 | Humidity-Temperature Cycling | (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 106 D of MIL-STD-202. Test cycle (24 hrs.) : 25 °C→65 °C→25 °C→65 °C→25 °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 107 D of MIL-STD-202. |
| 4.5.3 | Temperature Life | (Low-level Termination Resistance) To meet 4.3.1. (Appearance) No physical problem tolerated. | Engage connectors, and test for 250 hrs. at 85±2 °C (Condition B) per Test Method 108 A of MIL-STD-202. |

| Step | Temp. (°C) | Time (min.) |
|---|---|---|
| 1 | $-55\ ^{+0}_{-3}$ | 30 |
| 2 | $25\ ^{+10}_{-5}$ | 5 Max. |
| 3 | $85\ ^{+3}_{-0}$ | 30 |
| 4 | $25\ ^{+10}_{-5}$ | 5 Max. |

Fig. 4 (end)



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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 |
| Appearance | 3.3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Low-level Termination Resistance (Initial) | 4.3.1 | 3 | 2 | 2 | 2 | 2 | | | |
| Insuration Resistance (Initial) | 4.3.2 | | | | | | 2 | | |
| Dielectric Strrngth (Initial) | 4.3.3 | | | | | | 3 | | |
| Temperature Rising | 4.3.4 | | | | | | | 2 | |
| Connector Insuretion / 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 | | | | |
| Low-level Termination Resistance (Final) | 4.3.1 | 6 | 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 | 1 | 1 |

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

Fig. 5



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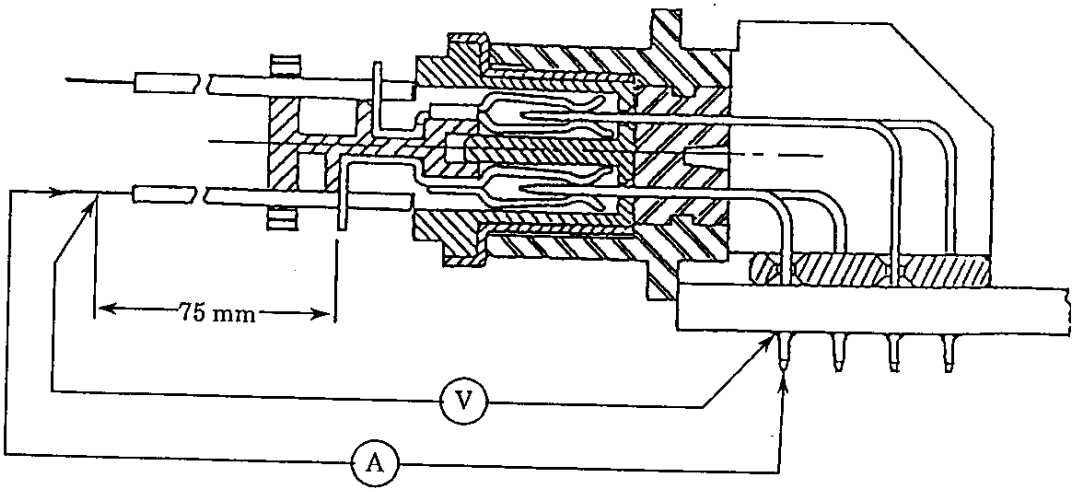
[Measurement of Low-level Resistance]




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

Fig. 6