Product Specification
108-5218
AMP Common Termination (CT), Connector
2mm Pitch, M/T Type

1. Scope:

1.1 Contents:

This specification covers the requirements for product performance, test methods and quality assurance provisions of AMP Common Termination (CT), Connector, 2mm Pitch, M/T Type. The applicable product description and part numbers are as shown in Fig.1:

Product Part No.	Descriptions
X-173977-X	M/T Receptacle Connector Assembly, 2-15-Pos. #28/#26 AWG
X-179694-X	M/T Receptacle Connector Assembly, 2-15-Pos. #24 AWG

Fig. 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 this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements this specification and referenced documents, this specification shall take precedence.

2.1 AMP Specifications:

A. 109-5000 Test Specification, General Requirements for Test Methods

B. 114-5104 Application Specification

C. 501-5122 Test Report

2.2 Military Standard and Specifications:

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

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LTR	REVISION RECORD	DR	DATE
S	REVISED D20051220031458_408907	C.Z	06DEC 05
R	REVISED FB00-0158-04	I.W	28JUL 04
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AMP Shanghai Ltd.

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TITLE
AMP Common Termination (CT), Connector, 2mm Pitch, M/T Type

3. Requirements:

3.1 Design and Construction:

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

3.2 Materials:

A. MT Receptacle Housing Assembly

Housing	: Glass-filled, PBT (UL94 V-0)
Receptacle Contact	: Pretinned Phosphor Bronze (0.8um min. thick)

B. Post Header Horizontal (H), Vertical (V) & Relay Use (R)

Post Header Housing	: 6/6 Nylon (UL94 V-0)
Post Contact	: Pretinned Brass (0.8um min. thick solder-plated over 0.5um min. thick copper underplate)

C. Post Header Horizontal (H), Vertical (V) & Relay Use (R)

Housing	: 6/6 Nylon (UL94 V-0)
Post	: Brass (0.2um min. thick Au Plated over 1~2um thick Nickel underplate)

D. Post Header Horizontal (H), Vertical (V) & Relay Use (R)

Housing	: 6/6 Nylon GF Type (UL94 V-0)
Post	: Pretin lead Brass (0.8um min. thick solder-plated over 0.5um min. thick copper underplate)

E. SMT Type Post Header Horizontal (H), Vertical (V)

Housing	: 6T PA (UL 94V-0)
Post	: Pretin lead Brass (0.8um min. thick solder-plated over 0.5um min. thick copper underplate)

3.3 Ratings:

A. Voltage Rating : 125 V(AC/DC)

B. Current Rating : 3A #24 AWG
2A #26 AWG
1A #28 AWG

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

The upper limit of the temperature includes the temperature rising resulted by the energised electrical current.

3.4 Applicable Wires:

A. Wire Size : #28 AWG, #26 AWG (0.08~0.14mm^2)
Recommended UL Grade: UL 1061, UL 1571
#24 AWG (0.22mm^2)
Recommended UL Grade: UL 1728

B. Insulation Diameter : 0.83~1.05mm
0.95~1.05mm (Only AWG #24)

3.5 Applicable Printed Circuit Board:

A. Board Thickness : 0.8~1.6mm

B. Hole Diameter : 0.8~0.9mm (for punched holes)
0.85~0.9mm (for drilled holes)

3.6 Applicable Panel Thickness:

0.8~1.6mm (To be used for post header and relay)

3.7 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.2, Para. 3.8. All tests shall be performed at ambient temperature unless otherwise specified.

3.8 Test Requirements and Procedures Summary:

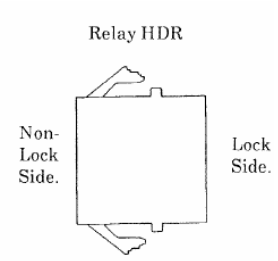
<table>
<tr><th>Para.</th><th>Test Items</th><th colspan="5">Requirements</th><th>Procedures</th></tr>
<tr><td colspan="7">Mechanical Performance Requirements</td></tr>
<tr><td>3.8.1 (1)</td><td>Connector Mating/ Unmating Force</td><td colspan="5">For post HDR.</td><td rowspan="11">Subject terminated connector and header to mate and unmate to measure the force required to engage and disengage by operating the head at a rate of 50 mm a minute. Record by using autograph.

</td></tr>
<tr><td></td><td></td><td>No. of Pos.</td><td colspan="2">Insertion [Max.] Unit: N</td><td colspan="2">Extraction [Min.] Unit: N</td></tr>
<tr><td></td><td></td><td>2
3
4</td><td colspan="2">34.3</td><td colspan="2">4.90</td></tr>
<tr><td></td><td></td><td>5
6
7</td><td colspan="2">49.0</td><td colspan="2">6.86</td></tr>
<tr><td></td><td></td><td>8
9
10</td><td colspan="2">63.7</td><td colspan="2">9.80</td></tr>
<tr><td></td><td></td><td>11
~
15</td><td colspan="2">73.5</td><td colspan="2">13.72</td></tr>
<tr><td></td><td></td><td colspan="5">For Relay HDR.</td></tr>
<tr><td></td><td></td><td rowspan="2">No. of Pos.</td><td colspan="2">Insertion [Max.] Unit: N</td><td colspan="2">Extraction [Min.] Unit: N</td></tr>
<tr><td></td><td></td><td>Non - Lock Side.</td><td>Lock Side.</td><td>Non - Lock Side.</td><td>Lock Side.</td></tr>
<tr><td></td><td></td><td>2
3
4</td><td>34.3</td><td>49.0</td><td>4.90</td><td>7.84</td></tr>
<tr><td></td><td></td><td>5
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7</td><td>49.0</td><td>63.7</td><td>6.86</td><td>9.80</td></tr>
<tr><td></td><td></td><td>8
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10</td><td>63.7</td><td>78.4</td><td>9.80</td><td>12.74</td></tr>
<tr><td></td><td></td><td>11
~
15</td><td>73.5</td><td>88.2</td><td>13.72</td><td>16.66</td></tr>
</table>

Fig. 2 (To be continued)

<table>
<tr><th>Para.</th><th>Test Items</th><th colspan="3">Requirements</th><th>Procedures</th></tr>
<tr><td>3.8.1 (2)</td><td>Contact Unmating Force</td><td colspan="3">0.784N Min.</td><td>After preconditioning by using applicable post for 3 cycles, measure the force required to unmate post by operating the head at a rate of 50mm a minute.</td></tr>
<tr><td rowspan="8">3.8.1 (3)</td><td rowspan="8">Tensile Strength of Wire Termination</td><td>Wire Size (AWG)</td><td>Traverse Direction [Min.] Unit: N</td><td>Axial Direction [Min.] Unit: N</td><td rowspan="8">Apply a pull-off load to terminated wire of contact secured on the tester, at a rate of 100mm a minute.
The load is applied in the axial and lateral directions as specified.</td></tr>
<tr><td># 28</td><td>11.8</td><td>14.7</td></tr>
<tr><td># 26 (UL 10272)</td><td>11.8</td><td>19.6</td></tr>
<tr><td># 26 (except UL 10272) & #24</td><td>14.7</td><td>19.6</td></tr>
<tr><td colspan="3">Apply Ribbon Cables and Flat Shielded Wire</td></tr>
<tr><td>Wire Size (AWG)</td><td>Traverse Direction [Min.] Unit: N</td><td>Axial Direction [Min.] Unit: N</td></tr>
<tr><td># 28</td><td>7.8</td><td>14.7</td></tr>
<tr><td># 26 & #24</td><td>7.8</td><td>19.6</td></tr>
<tr><td>3.8.1 (4)</td><td>Post Contact Retention Force</td><td colspan="3">14.7N Min. per contact.</td><td>Apply axial load to contact by operating at a rate of 50 mm a minute, after preconditioning for 3 insertion/extraction cycles by using applicable post contact. See Fig. 5.</td></tr>
</table>

Fig. 2 (To be continued)

Para.	Test Items	Requirements	Procedures
3.8.1 (5)	Panel Mounting Force (To be applied to post header for relay use)	49.0N Max.	By using AMP recommended panel cut-out layout dimensions, specified in AMP Customer Drawing, measure the force required to mount header into the panel. Loading is made from the punch entering direction of the cut-out hole. See Fig. 6.
3.8.1 (6)	Panel Retention Force	83.3N Min.	By using AMP recommended panel cut-out layout dimensions, specified in AMP Customer Drawing, measure the force required to dislodge header from the cut-out hole. AMP Spec. 109-49.
3.8.1 (7)	Confirmation of Product	Product shall be confirming to the requirements of applicable product drawing and Application Specification 114-5104.	Visually, dimensionally and functionally inspected per applicable inspection plan.
Electrical Performance Requirements			
3.8.2 (1)	Termination Resistance (Low Level)	10 mΩ Max. (Initial) 20 mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 50mA Max. at open circuit voltage of 50mV Max. See Fig. 3. AMP Spec. 109-5306.
3.8.2 (2)	Dielectric Strength	Connector must withstand test potential of 1.0 kV (AC) for 1 minute. Current leakage must be 5.0mA Max.	Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector assembly. (Measure on housing surface.) MIL-STD-202, Method 301.
3.8.2 (3)	Insulation Resistance	1000 MΩ Min. (Initial)	Measure by applying test potential between the adjacent contact, and between the contacts and ground in the mated connector assembly. MIL-STD-202, Method 302, Condition B.
3.8.2 (4)	Temperature Rising vs. Current	30°C max. under loaded specified current. See Fig. 3.	Measure temperature rising by energized current probing on the tine area of the post. AMP Spec. 109-5310.

Fig. 2 (To be continued)

Para.	Test Items	Requirements	Procedures
Environmental Performance Requirements			
3.8.3 (1)	Vibration Sinusoidal Low Frequency	No electrical discontinuity greater than 1 microsecond shall occur. Termination resistance (low level) shall be met.	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. MIL-STD-202, Method 201, Condition A.
3.8.3 (2)	Physical Shock	No electrical discontinuity greater than 1 microsecond shall occur. Termination resistance (low level) shall be met.	Subject mated connectors to 490.3 m/s^2 halfsine shock pulses of 11milisecond duration; 3 shocks in each direction applied along the 3 mutually perpendicular planes total 18 shocks. MIL-STD-202, Method 213, Condition A.
3.8.3 (3)	Temperature Life	Termination resistance (low level) shall be met.	Subject mated connectors to temperature life; testing atmosphere at 85±2°C for 96 hours.
3.8.3 (4)	Resistance to Cold	Termination resistance (low level) shall be met.	Subject mated connectors to cold testing atmosphere at -25 ±3°C for 48 hours. Subsequent measurement shall be done after reconditioning in the room temperature for 1 hour.
3.8.3 (5)	Humidity, Steady State	Insulation resistance (Final) 500 MΩ Min. Termination resistance (low level) shall be met.	Subject mated connectors to steady state humidity at 40°C and 90~95 % R.H. MIL-STD-202, Method 103, Condition B.
3.8.3 (6)	Thermal Shock	Termination resistance (low level) shall be met.	Subject mated connectors to 5 cycles between -55°C and 85°C for 30 minutes each duration at temperature extremes. MIL-STD-202, Method 107, Condition A.
3.8.3 (7)	Salt Spray	Resistance (low level) (Final) must meet visual & electrical requirements, which applicable.	Subject mated/unmated connectors to 5% salt concentration for 48 hours. MIL-STD-202, Method 101, Condition B.

Fig. 2 (To be continued)

Para.	Test Items	Requirements	Procedures
3.8.3 (8)	Sulfurous Acid Gas	Termination resistance (low level) shall be met.	Subject mated connectors to sulfurous acid gas atmosphere of 3±1ppm concentration at 40±2°C for 240 hours. Subsequent measurement shall be done after reconditioning in the room temperature for 1 hour.
3.8.3 (9)	Solderability	Solderable area shall have a solder coverage of 90% Min.	Subject contacts to solderability testing, as specified. MIL-STD-202, Method 208.
3.8.3 (10)	Resistance to Soldering Heat	No physical damage shall be evident after testing.	Subject product mounted on printed circuit boards to solder bath at 260±5°C for 10±1 seconds MIL-STD-202, Method 210 except as indicated above when testing by manual soldering iron, apply it as 350±10°C for 3 seconds without forcing pressure to affect the tine of contact. SMT product mounted on printed circuit boards to solder reflow as like Fig. 7.
3.8.3 (11)	Sequence Testing	The requirements for the each testing level shall be met.	See Para. 3.8.3 (11-1) and Para. 3.8.3 (11-2)
3.8.3 (11-1)	Connector Repeated Mating /Unmating	After testing, termination resistance (low level) shall be met.	Subject connector assembly to 30 cycles of repeated mating/unmating at a rate of 10 cycles a minute.
3.8.3 (11-2)	Temperature Humidity Cycling	After testing, termination resistance (low level) shall be met.	Subject mated connector to temperature changes between 25°C and 65°C with 95 % R.H. for 5 cycles. JIS C 0028.

Fig. 2 (End)

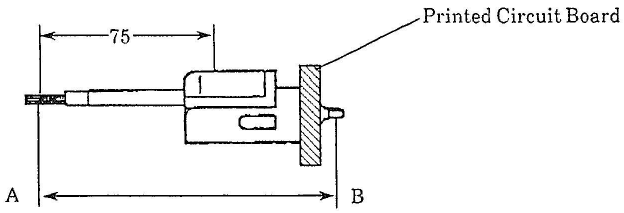


Fig.3

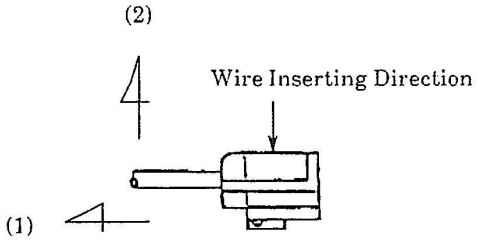


Fig.4



Fig.5

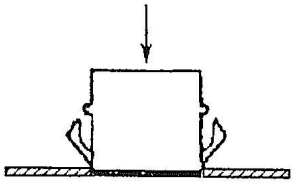


Fig.6

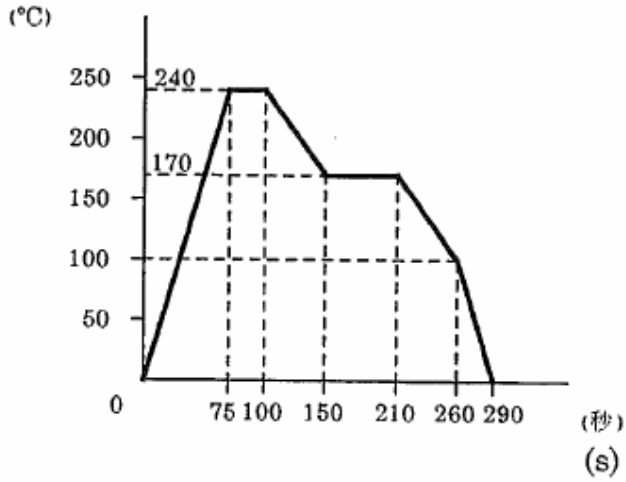


Fig.7

4. Quality Assurance Provisions:

4.1 Test Conditions:

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

Temperature : 15~30°C
Relative Humidity : 45~75 %
Atmospheric Pressure : 86.7~107kPa (650~800 mmHg)

4.2 Test Specimens:

The test specimens to be used for the performance evaluation testing, shall be prepared in accordance with AMP Application Specification, 114-5104, Termination of AMP CT Connector, 2 mm Pitch, M/T Type, by using the samples selected from the current production at random, and conforming to the requirements of the applicable product drawing.

5. Applicable Wires:

(Note: For compatibility of the wires for termination, the wires must be evaluated respectively, by the manufacturers, brand, tradenames and product catalog numbers.)

Applicable Wire Specifications (Nominal)	Wire Size	No. of Diameter Conductors of a Conductor (mm)	Calculated Cross-sectional Area (mm^2)	Insulation Diameter (mm)
Discrete Wire UL 1571 UL 1061	# 26 AWG # 28 AWG	# 26 AWG (7/0.16) # 28 AWG (7/0.127)	# 26 AWG (0.14) # 28 AWG (0.08)	# 26 AWG (0.93/1.05) # 28 AWG (0.83/0.97)
Ribbon Cable UL 2651 UL 20058				
Flat Shielded Wire UL 1533 UL 2547 UL 1691 UL 2791				
Discrete Wire UL 1728	# 24 AWG	# 24 AWG (7/0.203)	# 24 AWG (0.22)	# 24 AWG (0.95/1.05)

The applicable product descriptions and part numbers are as shown in Appendix 1.

Product Part No.	Product Descriptions	No. of Pos.
X-173979-X	Post Header, Horizontal (H)	2~15 Pos.
X-176931-X	Post Header, Horizontal (H), in Tube	2~15 Pos.
X-176303-X	Post Header, Horizontal (H), w/o Kink	2~15 Pos.
X-176304-X	Post Header, Horizontal (H), w/o Kink, in Tube	2~15 Pos.
X-173981-X	Post Header, Vertical (V)	2~15 Pos.
X-175519-X	Post Header, Vertical (V), in Tube	2~15 Pos.
X-175767-X	Post Header, Vertical (V), w/o Kink	2~15 Pos.
X-176240-X	Post Header, Vertical (V), w/o Kink, in Tube	2~15 Pos.
X-176750-X	Post Header, Vertical (V), Short Tine, w/o Kink	2~15 Pos.
X-176306-X	Post Header, Vertical (V), Gold-plated Contact Type	2~6 Pos.
X-175487-X	Post Header, Vertical (V), Box Type	2~15 Pos.
X-175660-X	Post Header, Vertical (V), Box Type, in Tube	2~15 Pos.
X-175768-X	Post Header, Vertical (V), Box Type, w/o Kink	2~15 Pos.
X-179078-X	Post Header, Vertical (V), Box Type, w/o Kink, in Tube	2~15 Pos.
X-176393-X	Post Header, Vertical (V), Gold-plated Contact, Box Type	2~6 Pos.
X-176838-X	Post Header, Vertical (V), Short Tine, Box Type, w/o Kink	2~15 Pos.
X-175390-X	Post Header, Vertical (V), Box Type, Polarized	2~15 Pos.
X-175854-X	Post Header, Vertical (V), Box Type, Polarized, in Tube	2~15 Pos.
X-177625-X	Post Header, Vertical (V), Short Tine, Box Type	6~9 Pos.
X-175489-X	Post Header, Horizontal (H), Box Type	2~15 Pos.
X-175661-X	Post Header, Horizontal (H), Box Type, in Tube	2~15 Pos.
X-176394-X	Post Header, Horizontal (H), Gold-plated Contact, Box Type	2~6 Pos.
X-177626-X	Post Header, Horizontal (H), Short Tine, Box Type	9~10 Pos.
X-175694-X	Post Header, w/Panel Lock, for Relay	2~15 Pos.

Product Part No.	Product Descriptions	No. of Pos.
X-177978-X	Post Header, Free Hanging, for Relay	2~5 Pos.
X-175624-X	Post Header, Vertical (V), Box Type, SMT Type	6 Pos.
X-176124-X	Post Header, Vertical (V), SMT Type	2~9 Pos.
X-176125-X	Post Header, Vertical (V), SMT Type, in Tube	2~9 Pos.
X-177621-X	Post Header, Vertical (V), SMT Type, w/o Embossment	2~9 Pos.
X-177622-X	Post Header, Vertical (V), SMT Type, in Tube, w/o Embossment	2~9 Pos.
X-176883-X	Post Header, Horizontal (H), SMT Type, Box Type	3 Pos.
X-176884-X	Post Header, Horizontal (H), SMT Type, Box Type, on Embossment Tape	3 Pos.
X-179119-X	Post Header, Horizontal (H), SMT Type, Box Type	2~6, 8 Pos.
X-179120-X	Post Header, Horizontal (H), SMT Type, Box Type	2~6, 8 Pos.
X-179121-X	Post Header, Horizontal (H), SMT Type, Box Type	2~5 Pos.
X-179122-X	Post Header, Horizontal (H), SMT Type, Box Type	2~5 Pos.
X-179123-X	Post Header, Horizontal (H), SMT Type, Box Type, on Embossment Tape	2~6, 8 Pos.
X-179504-X	Post Header, Vertical (V), GF Type	2, 4, 8~11 Pos.
X-179788-X	Post Header, Vertical (V), Forming Long Tine	3 Pos.
X-917072-X	Post Header, Vertical (V), Box Type, Polarized, GF Type	7~10, 13 Pos.
X-917341-X	Post Header, Vertical (V), SMT Type, Box Type	2~8 Pos.
X-917342-X	Post Header, Vertical (V), SMT Type, Box Type, on Embossment Tape	2~8 Pos.
X-316103-X	Post Header, Vertical (V), Forming Long Tine	2 Pos.
X-917766-X	Post Header, Vertical (V), Forming Long Tine	3 Pos.
X-917767-X	Post Header, Vertical (V), Forming Long Tine	3 Pos.
X-316167-X	Post Header, Vertical (V), SMT Type, Box Type, with Boss	2~8 Pos.
X-316500-X	Post Header, Vertical (V), SMT Type, Box Type, on Embossment Tape	2~8 Pos.

Appendix 1