



## SPECIFICATION

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SPEC. NO.: PS-59032-XXXXX-XXX

REVISION: J

PRODUCT NAME: HDMI A TYPE RECEPTACLE CONNECTOR

PRODUCT NO: 5903X, 5904X, 5905X, 5906X, 5907X, 5908X, 5909X, 5910X, 5953X, 5954X, 5956X, 5950X, 598XX, 3022X, 3023X, EJ80E, 3024X, 302XX SERIES

|   |  |   |
|---|--|---|
| PREPARED:<br><br><b>LIAO WAN TING</b><br><br>DATE:<br><b>2018.12.07</b> | CHECKED:<br><br><b>TENG CHANG HO</b><br><br>DATE:<br><b>2018.12.07</b> | APPROVED:<br><br><b>KUO JUNG HSUN</b><br><br>DATE:<br><b>2018.12.07</b> |
|---|--|---|



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Aces P/N: **59032 series**

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## 1 Revision History

| Rev. | ECN #       | Revision Description  | Prepared      | Date       |
|------|-------------|---|---------------|------------|
| O    | ECN-1309064 | RELEASED(APD1010383)  | ERIC          | 2013/09/06 |
| A    | ECN-1401388 | ADD Working voltage, 5909X, 5910X ,<br>5953X, 5954X   | ERIC          | 2014/01/28 |
| B    | ECN-1510005 | ADD 5956X   | ERIC          | 2015/10/05 |
| C    | ECN-1602167 | ADD 5950X IN SPEC(APL1050006)   | BRUCE         | 2016/02/23 |
| D    | ECN-1609002 | ADD 598XX IN SPEC(APLAPL1050066)  | BRUCE         | 2016/09/01 |
| E    | ECN-1612593 | ADD 3022X IN SPEC(APD1050288)   | TINA-L        | 2017/01/03 |
| F    | ECN-1705084 | ADD 3023X IN SPEC(APD1060079 )  | TINA-L        | 2017/05/03 |
| G    | ECN-1708447 | ADD SALT SPRAY OPTION: 96hours(Gold<br>plating 15u" & 30u") & ADD EJ80E IN<br>SPEC(APL1060112 ) | TINA-L        | 2017/08/17 |
| H    | ECN-1801427 | ADD 3024x SERIES & Add instructions to<br>Contact Retention Force                               | LIAO WAN TING | 2018.01.24 |
| J    | ECN-1812129 | ADD 302xx SERIES  | LIAO WAN TING | 2018.12.07 |

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## 2 SCOPE

This specification covers performance, tests and quality requirements for **HDMI A type receptacle connector**.

## 3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

## 4 REQUIREMENTS

### 4.1 Design and Construction

- 4.1.1 Connector shall be of the design, construction and physical dimensions specified on the applicable sales drawing.
- 4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

### 4.2 Materials and Finish

- 4.2.1 Contact: High performance copper alloy  
Finish: **Pls. refer to the drawing.**
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
- 4.2.3 **Shell: Copper alloy**  
Finish: **Pls. refer to the drawing.**

### 4.3 Ratings

- 4.3.1 Working voltage less than 36 volts (per pin)
- 4.3.2 Voltage: **40 V AC (per pin)**
- 4.3.3 Current: **0.5 Amperes (per pin)**
- 4.3.4 Operating Temperature : **-40°C to +85°C**

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## 5 Performance

### 5.1. Test Requirements and Procedures Summary

| Item   | Requirement  | Standard   |
|--|--|--|
| Examination of Product                           | Product shall meet requirements of applicable product drawing and specification.   | Visual, dimensional and functional per applicable quality inspection plan.   |
| <b>ELECTRICAL</b>                                |  |  |
| Item   | Requirement  | Standard   |
| Low Level Contact Resistance (Contact and Shell) | Initial:<br>Contact resistance excluding conductor resistance: <b>10</b> milliohms maximum.<br><br>After test:<br>Contact : Change from initial value: <b>30</b> milliohms maximum.<br>Shell Part : Change from initial value: <b>50</b> milliohms maximum.. | Mated connectors,<br>Contact: measure by dry circuit, 20 mVolts maximum, 10mA.<br>Shell: measured by open circuit, 5 Volts maximum, 100mA.<br><br>(EIA-364-23)   |
| Insulation Resistance                            | Unmated Connectors:<br><b>100 megaohms Min.</b>  | Unmated connectors, apply 500 Volts DC between adjacent terminal or ground.<br>(EIA 364-21)  |
|  | Mated Connectors:<br><b>10 megaohms Min</b>  | Mated connectors, apply 150 Volts DC between adjacent terminal or ground.<br>(EIA 364-21)  |
| Dielectric Withstanding Voltage                  | No discharge, flashover or breakdown.<br>Current leakage: <b>2 mA</b> max.   | At sea level for 1 minute.<br>Unmated connectors, apply <b>500</b> Volts AC (rms.) between Adjacent terminal or ground.<br>Mated connector, apply <b>300</b> Volts AC (rms.) between adjacent terminal and ground.<br>(EIA 364-20) |
| Temperature Rise                                 | <b>85 °C</b> , Max. temperature change<br><b>30°C</b> Max. change allowed  | Mate connector: measure the temperature rise at rated current until temperature stable.<br><b>55 °C</b> , Max. ambient.<br>(EIA-364-70 METHOD 1,CONDITION 1)   |

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|---|---------------------|--|
| <p>TMD5 Signals Time Domain Impedance</p>       | <p>100 ohms±15%</p> | <p>Rise time : 200 psec Max. (10%-90%)<br/>Signal to Ground pin ratio per HDMI designation.<br/>Differential Measurement Specimen Environment Impedance = 100 ohms differential.<br/>Source-side receptacle connector mounted on a Controlled impedance PCB fixture.<br/>EIA-364-108</p>                                 |
| <p>TMD5 Signals Time Domain Cross Talk FEXT</p> | <p>5% Max.</p>      | <p>Rise time : 200 psec Max. (10%-90%)<br/>Signal to Ground pin ratio per HDMI designation.<br/>Differential Measurement Specimen Environment Impedance = 100 ohms differential.<br/>Source-side receptacle connector mounted on a Controlled impedance PCB fixture.<br/>Driven pair and victim pair.<br/>EIA-364-90</p> |

**MECHANICAL**

| Item   | Requirement   | Standard   |
|--|---|--|
| <p>Durability</p>  | <p>10000 cycles.</p>  | <p>Measure contact and shell resistance after Following.<br/>Automatic cycling:<br/>10,000 cycles at 100±50 cycles per hour</p>  |
| <p>Insertion/Withdrawal Force</p>                        | <p>Insertion Force:<br/>44.1N {4.5kgf} maximum<br/>Withdrawal Force:<br/>9.8N {1.0kgf} minimum<br/>39.2N {4.0kgf} maximum</p> | <p>Insertion and withdrawal speed :<br/>25mm/minute.<br/>(EIA-364-13)</p>  |
| <p>Contact Retention Force (FOR ASSEMBLED TYPE ONLY)</p> | <p>0.5kgf Min.</p>  | <p>Operation Speed :<br/>25.4 ± 3 mm/minute.<br/>Measure the contact retention force with tester.</p>  |
| <p>Vibration</p>   | <p>1 µs Max.</p>  | <p>Amplitude : 1.52mm P-P or 147m/s2 {15G}<br/>Sweep time: 50-2000-50Hz in 20 minutes.<br/>Duration : 12 times in each (total of 36 Times) X, Y, Z axes.<br/>Electrical load : DC100mA current shall be flowed during the test.<br/>(EIA-364-28 Condition III)</p> |

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|   |   |   |
|---|---|---|
| Shock (Mechanical)                            | 1 $\mu$ s Max.  | Pulse width: 11 msec.,<br>Waveform : half sine,<br>490m/s <sup>2</sup> {50G}, 3 strokes in each<br>X.Y.Z. axes<br>(EIA-364-27, Condition A)   |
| <b>ENVIRONMENTAL</b>                          |   |   |
| <b>Item</b>                                   | <b>Requirement</b>  | <b>Standard</b>   |
| Resistance to <b>Reflow</b><br>Soldering Heat | See Product Qualification<br>and Test Sequence Group<br><b>10 (Lead Free)</b> | Pre Heat : 150°C~180°C, 60~120sec.<br>Heat : 230°C Min., 40sec Min.<br>Peak Temp. : 260°C Max, 10sec<br>max.  |
| Thermal Shock                                 | See Product Qualification<br>and Test Sequence Group <b>4</b>                 | Mate module and subject to follow<br>condition for 5 cycles.<br>1 cycles:<br>-55 +0/-3 °C, 30 minutes<br>+85 +3/-0 °C, 30 minutes<br>(EIA-364-32, test condition I)   |
| Humidity                                      | See Product Qualification<br>and Test Sequence Group <b>4</b>                 | Mate/unmate connectors together<br>and perform the test as No Damage<br>follows.<br>Temperature : +25°C to +85°C<br>Relative Humidity : 80% to 95%<br>Duration : 4 cycles (96 hours)<br>Upon completion of the test,<br>specimens shall be conditioned at<br>ambient room conditions for 24<br>hours, after which the specified<br>measurements shall be performed.<br>(EIA-364-31) |
| Thermal Aging                                 | See product Qualification<br>and test sequence group <b>5</b>                 | Mate connectors and expose to 105<br>$\pm$ 2°C for 250 hours. Upon<br>completion of the exposure period,<br>the test specimens shall be<br>conditioned at ambient room<br>conditions for 1 to 2 hours, after<br>which the specified measurements<br>shall be performed.<br>(EIA-364-17)   |

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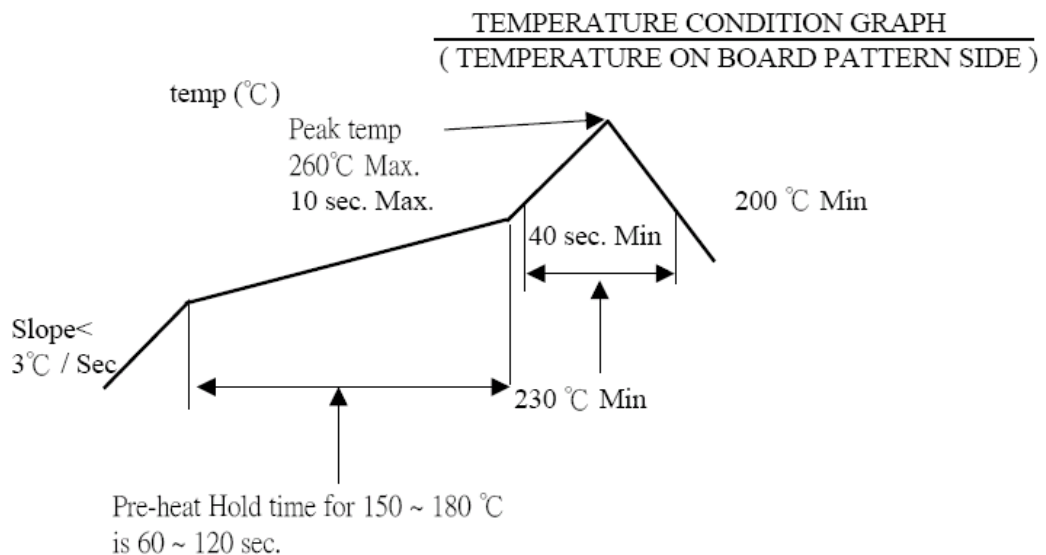
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|                                       |  |  |
|---------------------------------------|--|--|
| Salt Spray<br>(Only For Gold Plating) | See Product Qualification and Test Sequence Group 6  | Subject mated/unmated connectors to 5% salt-solution concentration, 35°C<br>(I) Gold flash for 8 hours<br>(II) Gold plating 5 u"、15u"、30u" for 96 hours.<br>(EIA-364-26) |
| Solder ability                        | Tin plating:<br>Solder able area shall have minimum of 95% solder coverage.<br>Gold plating:<br>Solder able area shall have minimum of 75% solder coverage | Subject the test area of contacts into the flux for 5-10 sec. And then into solder bath, Temperature at 245±5°C, for 4-5 sec.<br>(EIA-364-52)                            |
| Hand Soldering Temperature Resistance | Appearance: No damage  | T ≥ 350°C, 3sec at least.  |

**Note.** Flowing Mixed Gas shall be conduct by customer request.

**6 INFRARED REFLOW CONDITION**







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**7 PRODUCT QUALIFICATION AND TEST SEQUENCE**

| Test or Examination                               | Test Group    |     |     |      |     |     |   |   |     |    |
|---|---------------|-----|-----|------|-----|-----|---|---|-----|----|
|   | 1             | 2   | 3   | 4    | 5   | 6   | 7 | 8 | 9   | 10 |
|   | Test Sequence |     |     |      |     |     |   |   |     |    |
| Examination of Product                            | 1,3           |     |     | 1,7  | 1,6 | 1,4 |   |   | 1,4 |    |
| Low Level Contact Resistance (Contact and Shell)  |               | 1,5 | 1,4 | 2,10 | 2,9 | 2,5 |   |   | 2,5 |    |
| Insulation Resistance                             |               |     |     | 3,9  | 3,8 |     |   |   |     |    |
| Dielectric Withstanding Voltage                   |               |     |     | 4,8  | 4,7 |     |   |   |     |    |
| Temperature Rise                                  | 2             |     |     |      |     |     |   |   |     |    |
| Insertion/Withdrawal Forces                       |               | 2,4 |     |      |     |     |   |   |     |    |
| Contact Retention Force (FOR ASSEMBLED TYPE ONLY) |               |     |     |      |     |     |   | 1 |     |    |
| Durability  |               | 3   |     |      |     |     |   |   |     |    |
| Vibration   |               |     | 2   |      |     |     |   |   |     |    |
| Shock(Mechanical)                                 |               |     | 3   |      |     |     |   |   |     |    |
| Resistance to Soldering Heat                      |               |     |     |      |     |     |   |   | 3   |    |
| Thermal Shock                                     |               |     |     | 5    |     |     |   |   |     |    |
| Humidity  |               |     |     | 6    |     |     |   |   |     |    |
| Thermal Aging                                     |               |     |     |      | 5   |     |   |   |     |    |
| Salt Spray(Only For Gold Plating)                 |               |     |     |      |     | 3   |   |   |     |    |
| Solder ability                                    |               |     |     |      |     |     | 1 |   |     |    |
| Hand Soldering Temperature Resistance             |               |     |     |      |     |     |   |   |     | 1  |
| TMDS Signals Time Domain Impedance                |               |     |     |      |     |     |   |   |     |    |
| TMDS Signals Time Domain Cross Talk FEXT          |               |     |     |      |     |     |   |   |     |    |
| Sample Size                                       | 2             | 4   | 4   | 4    | 4   | 4   | 2 | 4 | 4   | 4  |