

SPECIFICATION FOR  
CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING  
COPING WITH AUTOMATIC MOUNTING & SMT  
HFW\_\_S-2STA\_\_LF / HFW\_\_S-2STB\_\_LF

## 1. SCOPE

This specification covers the requirements for the connector (HFW\_\_S-2ST\_\_LF) which the edge of 1mm spacing FPC(Flexible Printed circuit) and FFC(Flexible Flat Cable) are inserted into directly and connected to and which copes with automatic mounting and SMT.

## 2. APPLICABLE STANDARDS

|            |                                                                                      |
|------------|--------------------------------------------------------------------------------------|
| JIS C 5402 | Method for Test of Connectors for Electronic Equipment                               |
| JIS C 0806 | Packaging of Electronic Components on Continuous Tapes<br>(Surface Mount Components) |
| UL - 94    | TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN<br>DEVICES AND APPLIANCES.  |

## 3. CATALOG No.

|                                    |     |    |   |   |   |    |   |    |    |
|------------------------------------|-----|----|---|---|---|----|---|----|----|
|                                    | HFW | 20 | S | - | 2 | ST | B | E1 | LF |
| Series                             |     |    |   |   |   |    |   |    |    |
| Number of Contacts                 |     |    |   |   |   |    |   |    |    |
| Straight                           |     |    |   |   |   |    |   |    |    |
| For FPC/FFC                        |     |    |   |   |   |    |   |    |    |
| Cope with automatic mounting & SMT |     |    |   |   |   |    |   |    |    |
| Contact plating                    |     |    |   |   |   |    |   |    |    |
| A: Selective gold plating          |     |    |   |   |   |    |   |    |    |
| B: All gold plating                |     |    |   |   |   |    |   |    |    |
| Plastic Tape Packaging             |     |    |   |   |   |    |   |    |    |
| Lead Free                          |     |    |   |   |   |    |   |    |    |

## 4. SHAPE, DIMENSIONS AND MATERIALS

See attached drawings.

## 5. ACCOMMODATED CONDUCTORS (FPC/FFC)

See attached drawings.

## 6. PACKAGING CONDITION

See attached drawings.

## 7. RECOMMENDED MOUNTING PATTERN DIMENSIONS

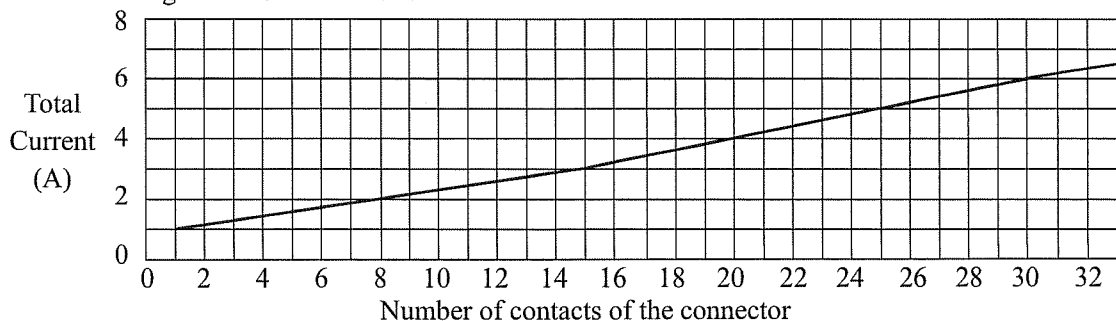
See attached drawings.

## 8. RATING

- 8-1. Voltage : A.C.100V      D.C.100V  
8-2. Current : A.C.1A      D.C.1A (Refer to the following note.)  
8-3. Operating Temperature : -55°C ~ +85°C  
(Including terminal temperature rises)

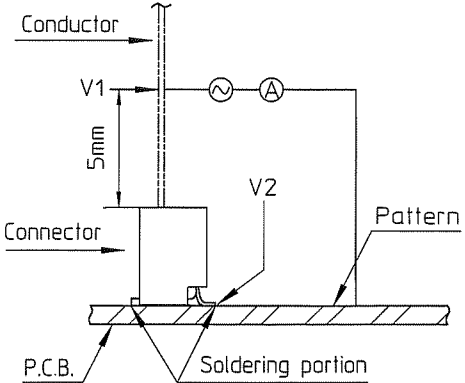
NOTE

Allowable maximum current for one contact is 1A. Total allowable current for a whole connector is the following values shown below.



## 9. PERFORMANCE CHARACTERISTICS

## 9-1. Electrical Performance

| No.   | Test Item                       | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                           | Requirements                                                                                                                                   |
|-------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 9-1-1 | Contact resistance              | <p>1) Measure contact resistance between <math>V_1</math>-<math>V_2</math> by voltage drop method using the following circuit by mating accommodated conductor stipulated in clause 5 after reflow soldering the connector on the P.C.B. and cleaning flux dregs.</p>  <p>2) Open circuit voltage : Less than A.C.20mV<br/>3) Test current : Less than A.C.20mA</p> | <p>1) Initial value : Less than 30mΩ<br/>2) Contact resistance after the test is in accordance with the value specified in each test item.</p> |
| 9-1-2 | Insulation resistance           | <p>1) Measure insulation resistance between adjacent contacts in a connector individual.<br/>2) Test voltage : D.C.500V<br/>3) Read value one minute after applying test voltage.</p>                                                                                                                                                                                                                                                                 | 1) More than 500MΩ                                                                                                                             |
| 9-1-3 | Dielectric withstanding voltage | <p>1) For one minute, apply A.C.500V between adjacent contacts in a connector individual.<br/>2) Set current : A.C.1mA</p>                                                                                                                                                                                                                                                                                                                            | 1) Free from any short circuit and insulation breakdown.                                                                                       |

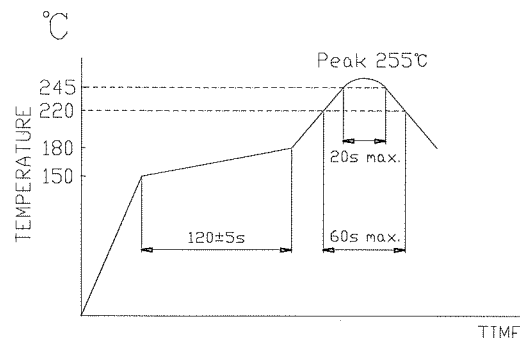
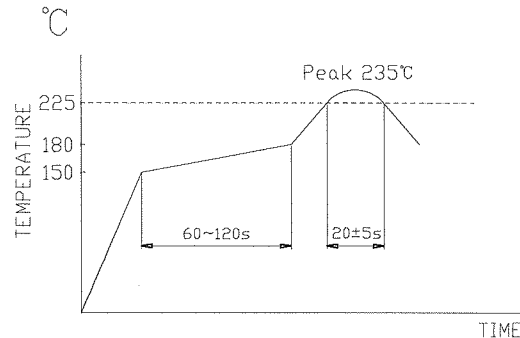
## 9-2. Mechanical Performance

| No.   | Test Item                             | Test Method                                                                                                                                                                                                                                                                             | Requirements                                                                                                                                                                                   |
|-------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9-2-1 | Durability (Insertion and extraction) | <p>1) Measure contact resistance before and after the test by the method in clause 9-1-1 by mating the accommodated conductor specified in clause 5.<br/>2) Number of Insertion and extraction : 30 times<br/>3) Speed of insertion and extraction : Less than 10 times per minute.</p> | <p>1) Initial contact resistance : Less than 30mΩ<br/>2) Contact resistance after the test : Less than 50mΩ<br/>3) Free from any defect such as break etc. on the connector and conductor.</p> |
| 9-2-2 | Vibration (Sinusoidal)                | <p>JIS C 60068-2-6 (IEC60068-2-6)<br/>1) Frequency range : 10 ~ 500Hz<br/>2) Amplitude : 0.75mm or Acceleration : 100m/s<sup>2</sup><br/>3) Sweep rate : 1 octave/minute<br/>4) Kind of test : Sweep endurance test<br/>5) Test time : 10 cycles</p>                                    | <p>1) During the test, no circuit opening for more than 1μs.<br/>2) Free from any defect such as break, deformation, loosening and falling off etc. on each portion of the connector.</p>      |

## 9-3. Environmental Performance

| No.   | Test Item                   | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Requirements                                                                                                                                                      |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
|-------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|---|-------|----|---|------|-------|---|------|----|---|------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9-3-1 | Damp heat<br>(Steady state) | JIS C 60068-2-78 (IEC60068-2-78)<br>1)Measure contact resistance before and after the test by the method in clause 9-1-1 by mating the accommodated conductor specified in clause 5.<br>2)Measure insulation resistance after the test by the method in clause 9-1-2.<br>3)Bath temperature : 40°C<br>4)Bath humidity : 90 ~ 95% (relative humidity)<br>5)Period of exposure : 48 hours<br>6)Expose conductor and connector in mated condition and leave them under normal temperature. (Without insertion and separation)                                                                                        | 1)Initial contact resistance : Less than 30mΩ<br>2)Contact resistance after the test : Less than 50mΩ<br>3)Insulation resistance after the test : More than 100MΩ |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 9-3-2 | Salt spray                  | JIS C 60068-2-11 (IEC60068-2-11)<br>1)Measure contact resistance before and after the test according to the method in clause 9-1-1 by mating the accommodated conductor specified in clause 5.<br>2)Salt solution concentration : 5%<br>3)Period of exposure : 48 hours<br>4)Expose conductor and connector in mated condition and leave them under normal temperature after posttreatment. (24 hours)                                                                                                                                                                                                            | 1)Initial contact resistance : Less than 30mΩ<br>2)Contact resistance after the test : Less than 50mΩ                                                             |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 9-3-3 | Change of temperature       | JIS C 0025 (IEC60068-2-14)<br>1)Measure contact resistance before and after the test according to the method in clause 9-1-1 by mating accommodated conductor in clause 5.<br>2)One cycle of temperature is as follow and test 5 cycles. <table border="1"><tr><th>Step</th><th>Temp.(°C)</th><th>Time(min.)</th></tr><tr><td>1</td><td>-55±3</td><td>30</td></tr><tr><td>2</td><td>25±2</td><td>2 ~ 3</td></tr><tr><td>3</td><td>85±2</td><td>30</td></tr><tr><td>4</td><td>25±2</td><td>2 ~ 3</td></tr></table><br>3)Expose conductor and connector in mated condition and leave them under normal temperature. | Step                                                                                                                                                              | Temp.(°C) | Time(min.) | 1 | -55±3 | 30 | 2 | 25±2 | 2 ~ 3 | 3 | 85±2 | 30 | 4 | 25±2 | 2 ~ 3 | 1)Initial contact resistance : Less than 30mΩ<br>2)Contact resistance after the test : Less than 50mΩ<br>3)Free from any defect such as crack, warping and deformation etc. on each portion the connector. |
| Step  | Temp.(°C)                   | Time(min.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                   |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 1     | -55±3                       | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                   |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 2     | 25±2                        | 2 ~ 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                   |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 3     | 85±2                        | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                   |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |
| 4     | 25±2                        | 2 ~ 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                   |           |            |   |       |    |   |      |       |   |      |    |   |      |       |                                                                                                                                                                                                            |

## 9-4. Other performance

| No.   | Test Item                                        | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Requirements                                                                                                                                                                                                                                                                                                                      |
|-------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9-4-1 | Soldering<br>(Resistance to<br>reflow soldering) | <p>JIS C 60068-2-58 (IEC60068-2-58)</p> <p>1) Solder by setting reflow bath on the following condition.</p> <p>2) Preheating : 150~180°C, 120±5s</p> <p>3) Soldering : 220°C min. 60s max.</p> <p>4) Peak : 245°C min. 20s max.<br/>(Peak 255°C max.)</p> <p>(See Diagram A)</p> <p>NOTE: Temperature must be measured at contact terminal portion and peak temperature on the upper surface of P.C.B must be less than 260°C.</p> <p>4) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5</p> | <p>1) Contact resistance after the test : Less than 50Ω</p> <p>2) Insulation resistance after the test : More than 100MΩ</p> <p>3) No short circuit and insulation breakdown for dielectric withstanding voltage test after this test.</p> <p>4) Free from any damage on performance and contact performance after soldering.</p> |
|       |                                                  | <p><u>Diagram A</u></p>  <p>Resistance to reflow soldering profile</p>                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                   |
| 9-4-2 | Soldering<br>(Solderability)<br>(Reflow)         | <p>JIS C 60068-2-58 (IEC60068-2-58)</p> <p>1) Solder by setting reflow bath on the following condition.</p> <p>2) Preheating : 150~180°C, 60~120s</p> <p>3) Soldering : 225°C min., 20±5s<br/>(Peak 235°C max.)</p> <p>(See Diagram B)</p> <p>NOTE: Temperature must be measured at contact terminal portion and peak temperature on the upper surface of P.C.B must be less than 260°C.</p> <p>4) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5</p>                                       | <p>1) Actual soldered area must be more than 95% of the dipped area intended to be soldered.</p>                                                                                                                                                                                                                                  |
|       |                                                  | <p><u>Diagram B</u></p>  <p>Solderability profile</p>                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                   |
| 9-4-3 | Conductor<br>retention force<br>(Reference)      | <p>1) Measure total extraction force (initial value) by using accommodated conductor specified in clause 5.</p>                                                                                                                                                                                                                                                                                                                                                                                     | <p>1) More than 0.35N/contact</p>                                                                                                                                                                                                                                                                                                 |

## 10. INDICATION AND PACKAGING

### 10-1. Indication

- 1) Catalog number and lot number are not indicated on the connector.
- 2) Catalog number and quantity shall be indicated on the surface of the package box.

### 10-2. Packaging

- 1) The connector individuals are packed by tapes with specified quantity in accordance with [JIS C 0806 "Packaging of Electronic Components on Continuous Tapes (Surface Mount components)"] and put into package box in accordance with our packaging specification.

## 11. Remarks

- 11-1. Retention force for accommodated conductor specified in clause 9-4-3 differs due to its kind, structure and surface treatment of conductor. Therefore, the value of retention force specified in the clause for performance is reference value.
- 11-2. Please use for Gold plating cable as accommodated conductor.
- 11-3. Please refer to the "Handling procedures and remarks" before use.

# AMEYA360

## Components Supply Platform

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