

SPECIFICATION FOR  
 CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING  
 COPING WITH AUTOMATIC MOUNTING & SMT  
HFW S-2STA LF / HFW S-2STB LF

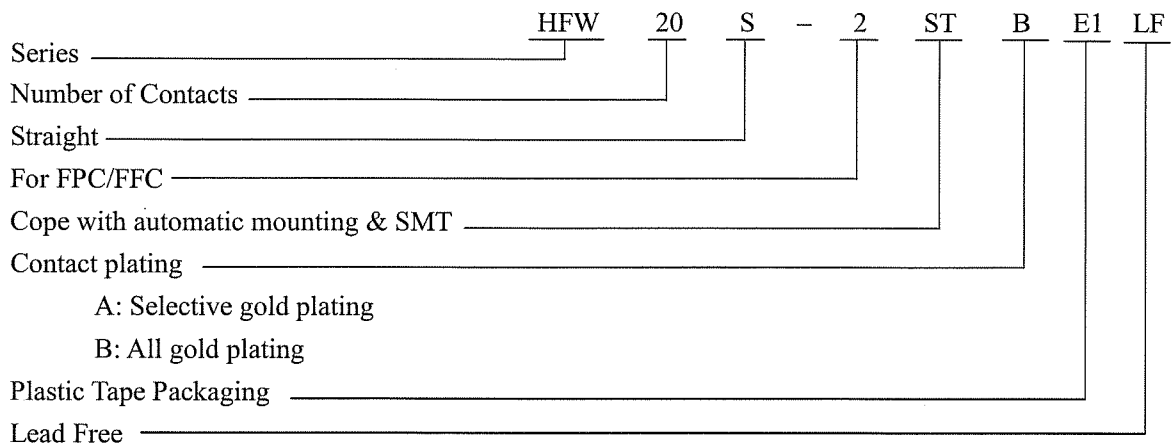
1. SCOPE

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 (Surface Mount Components)
- UL - 94 TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES.

3. CATALOG No.



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

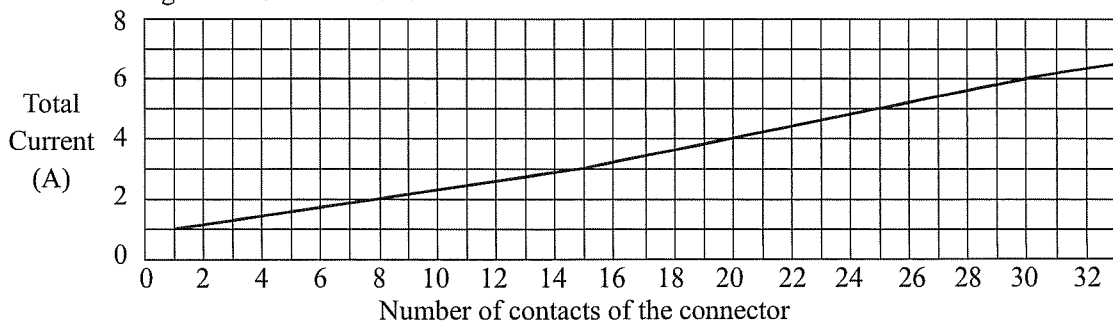
See attached drawings.

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)

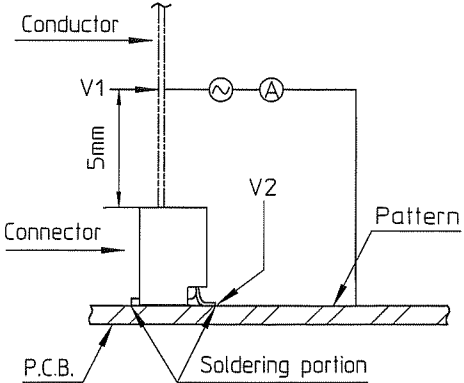
NOTE

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 3) Test current : Less than A.C.20mA</p>	<p>1) Initial value : Less than 30mΩ 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. 2) Test voltage : D.C.500V 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. 2) Set current : A.C.1mA</p>	1) Free from any short circuit and insulation breakdown.

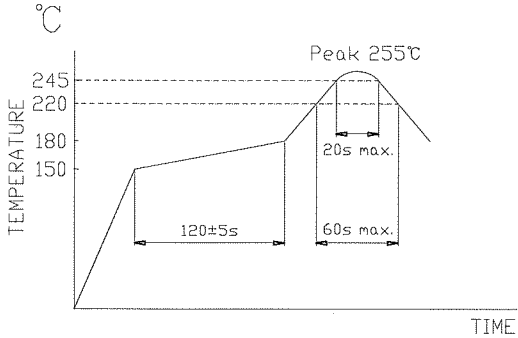
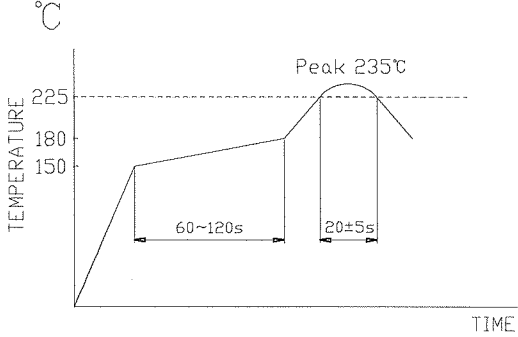
9-2. Mechanical Performance

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. 2) Number of Insertion and extraction : 30 times 3) Speed of insertion and extraction : Less than 10 times per minute.</p>	<p>1) Initial contact resistance : Less than 30mΩ 2) Contact resistance after the test : Less than 50mΩ 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) 1) Frequency range : 10 ~ 500Hz 2) Amplitude : 0.75mm or Acceleration : 100m/s<sup>2</sup> 3) Sweep rate : 1 octave/minute 4) Kind of test : Sweep endurance test 5) Test time : 10 cycles</p>	<p>1) During the test, no circuit opening for more than 1μs. 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 (Steady state)	JIS C 60068-2-78 (IEC60068-2-78) 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. 2) Measure insulation resistance after the test by the method in clause 9-1-2. 3) Bath temperature : 40°C 4) Bath humidity : 90 ~ 95% (relative humidity) 5) Period of exposure : 48 hours 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 2) Contact resistance after the test : Less than 50mΩ 3) Insulation resistance after the test : More than 100MΩ															
9-3-2	Salt spray	JIS C 60068-2-11 (IEC60068-2-11) 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. 2) Salt solution concentration : 5% 3) Period of exposure : 48 hours 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 2) Contact resistance after the test : Less than 50mΩ															
9-3-3	Change of temperature	JIS C 0025 (IEC60068-2-14) 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. 2) One cycle of temperature is as follow and test 5 cycles. <table border="1" data-bbox="651 1350 1059 1505"> <thead> <tr> <th>Step</th> <th>Temp.(°C)</th> <th>Time(min.)</th> </tr> </thead> <tbody> <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> </tbody> </table> 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 2) Contact resistance after the test : Less than 50mΩ 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 (Resistance to 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. (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 style="text-align: center;">Resistance to reflow soldering profile</p>	
9-4-2	Soldering (Solderability) (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 (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 style="text-align: center;">Solderability profile</p>	
9-4-3	Conductor retention force (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 it's 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“Handing procedures and remarks”before use.

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