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.

HFW 20 S – 2 ST B E1 LF

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

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

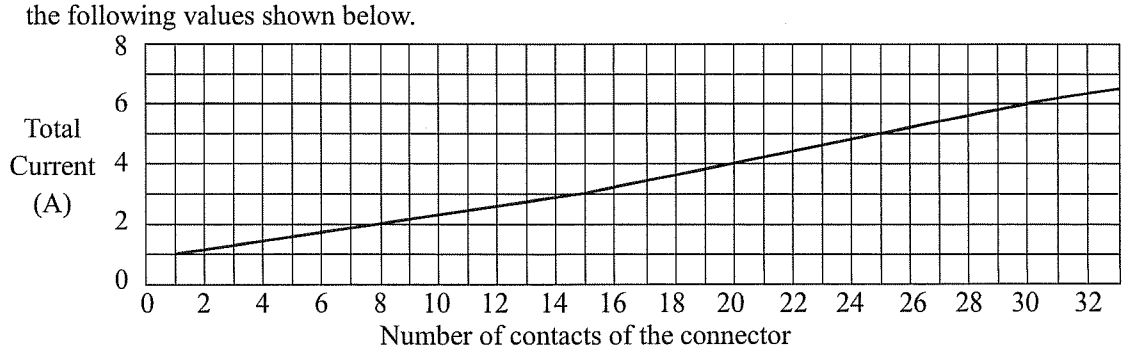
See attached drawings.

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)

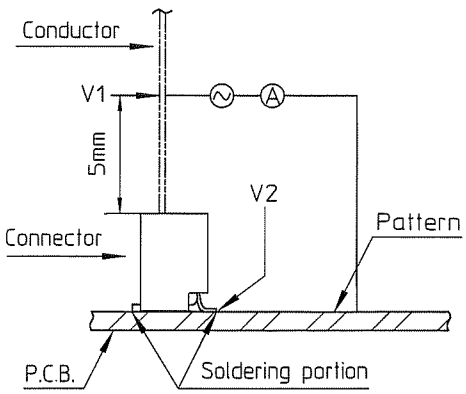
NOTE

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	1)Measure contact resistance between V_1-V_2 by voltage drop method using the following circuit by mating accommodated conductor stipulated in clause 5 after reflow soldering the connector on the P.CB. and cleaning flux dregs.  2)Open circuit voltage : Less than A.C.20mV 3)Test current : Less than A.C.20mA	1)Initial value : Less than 30mΩ 2)Contact resistance after the test is in accordance with the value specified in each test item.
9-1-2	Insulation resistance	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.	1)More than 500MΩ
9-1-3	Dielectric withstanding voltage	1)For one minute, apply A.C.500V between adjacent contacts in a connector individual. 2)Set current : A.C.1mA	1)Free from any short circuit and insulation breakdown.

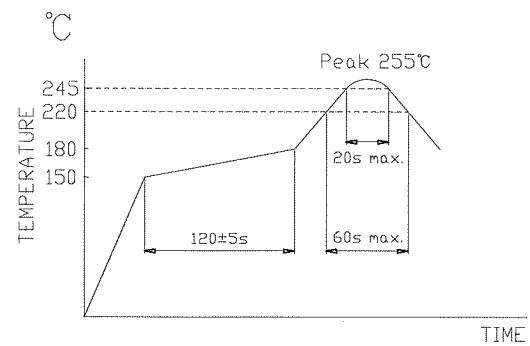
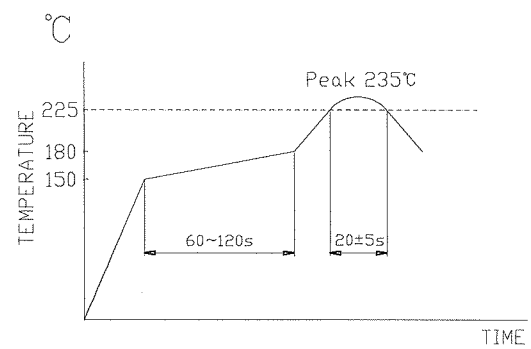
9-2. Mechanical Performance

No.	Test Item	Test Method	Requirements
9-2-1	Durability (Insertion and extraction)	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.	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.
9-2-2	Vibration (Sinusoidal)	JIS C 60068-2-6 (IEC60068-2-6) 1)Frequency range : 10 ~ 500Hz 2)Amplitude : 0.75mm or Acceleration : 100m/s^2 3)Sweep rate : 1 octave/minute 4)Kind of test : Sweep endurance test 5)Test time : 10 cycles	1)During the test, no circuit opening for more than 1μs. 2)Free from any defect such as break, deformation, loosing and falling off etc. on each portion of the connector.

9-3. Environmental Performance

<table>
<tr><th>No.</th><th>Test Item</th><th>Test Method</th><th>Requirements</th></tr>
<tr><td>9-3-1</td><td>Damp heat
(Steady state)</td><td>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)</td><td>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</td></tr>
<tr><td>9-3-2</td><td>Salt spray</td><td>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)</td><td>1)Initial contact resistance
: Less than 30mΩ
2)Contact resistance after the test : Less than 50mΩ</td></tr>
<tr><td>9-3-3</td><td>Change of temperature</td><td>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>
<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>
3)Expose conductor and connector in mated condition and leave them under normal temperature.</td><td>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.</td></tr>
</table>

9-4. Other performance

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

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.