SPECIFICATION FOR
CONNECTOR USED FOR FPC/FFC WITH 1mm CONTACT SPACING
COPING WITH AUTOMATIC MOUNTING & SMT
SFW_ _R-1/2STE_

1. SCOPE
   This specification covers the requirements for the connector (SFW_ _R-1/2STE_) with 1mm spacing to which the edge of FPC(Flexible Printed Circuit) and FFC(Flexible Flat Cable) can be connected by Zero-Insertion-Force method and which copes with automatic mounting and SMT.

2. APPICABLE 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. STRUCTURE

SFW	20	R	–	1	ST	E1

   Series
   Number of Contacts
   Right Angle
   For FPC/FFC, Contact direction
   1 : Lower contact type
   2 : Upper contact type
   Cope with automatic mounting & SMT
   Plastic Tape Packaging

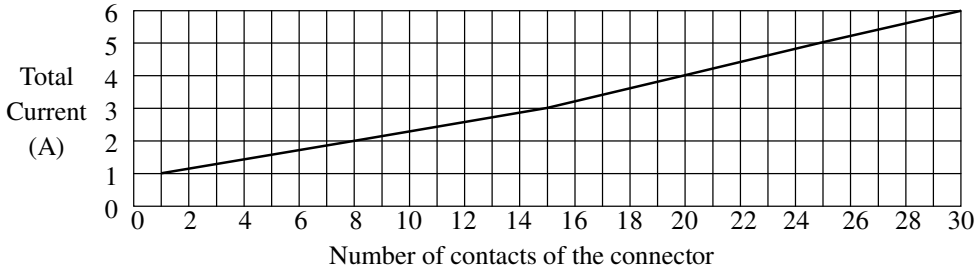
4. CONNECTOR SHAPE, DIMENSIONS AND MATERIALS
   See attached drawings.

5. ACCOMMODATED CONDUCTORS (FPC/FFC)
   See attached drawings.

6. PACKAGING CONDITION
   See attached drawings.

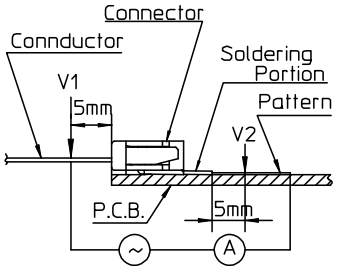
7. RECOMMENDED MOUNTING PATTERN DIMENSIONS
   See attached drawings.

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 value which is shown in the following figure.



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 by 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 (Slider operation)	1)Measure contact resistance before and after the test by the method in clause 9-1-1 by mating the accommodated. 2)Number of slider open and close : 20 times (Insert and extract the conductor for each opening of the slider.)	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 0040 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 0022
1)Measure contact resistance before and after the test by the method in clause 9-1-1 by using 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 0023
1)Measure contact resistance before and after the test according to the method in clause 9-1-1 by using 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.</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
1)Measure contact resistance before and after the test according to the method in clause 9-1-1 by using 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

<table>
<tr><th>No.</th><th>Test Item</th><th>Test Method</th><th>Requirements</th></tr>
<tr><td>9-4-1</td><td>Soldering
(Resistance to reflow soldering)</td><td>1)Solder by setting reflow bath on the following condition.
2)Preheating : 150±10°C, 60~120 s
3)Soldering : 240±5°C, 30±1s
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 H60A or H63A. Soldering particle is more than 200 mesh and flux is inactive rosin family flux.</td><td>1)Contact resistance after the test : Less than 50mΩ
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.</td></tr>
</table>

No.	Test Item	Test Method	Requirements
9-4-2	Soldering (Solderability) (Reflow)	1)Solder by setting reflow bath on the following condition. 2)Preheating : 150±10°C, 60~120 s 3)Soldering : 215±5°C, 10±1s 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 H60A or H63A. Soldering particle is more than 200 mesh and flux is inactive rosin family flux.	1)Actual soldered area must be more than 90% of the dipped area intended to be soldered.
9-4-3	Conductor retention force (Reference)	1)Measure initial retention force after inserted and locked by using accommodated conductor specified in clause 5.	1)More than 0.88N/contact for FPC (More than 90g/contact for FPC) 2)More than 0.68N/contact for FFC (More than 70g/contact for FFC)

10. INDICATION AND PACKAGING

10-1. Indication

1) Catalog number and lot number are not be 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 FCI JAPAN packaging specification.

11. Remarks

11-1. Please refer to the"Handing procedures and remarks"before use.

11-2. 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.

11-3. Since this connector can not be used for CIC (Conductor such as silver paste, carbon etc.) as accommodated conductor, please consult us separately.