

NUMBER <b>SC-SFWS03</b>	TYPE <b>GENERAL PRODUCT SPECIFICATION</b>	<b>Amphenol FCI</b>	
TITLE <b>1mm CONTACT SPACING CONNECTOR FOR FPC/FFC (SFW__S-2ST_E_LF)</b>		PAGE <b>1 of 11</b>	REVISION <b>C</b>
		AUTHORIZED BY <b>S.Watanabe</b>	DATE <b>01/09/'24</b>
		CLASSIFICATION <b>UNRESTRICTED</b>	

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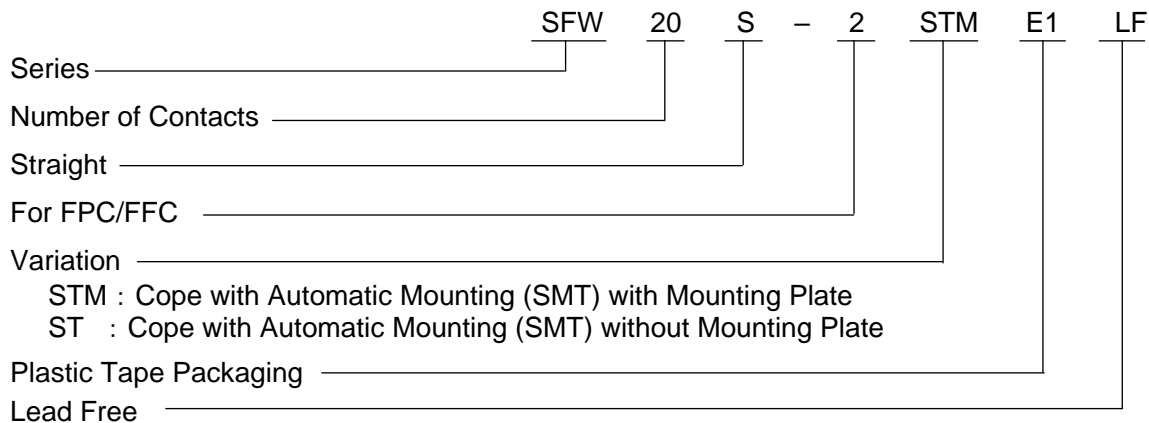
### 1. SCOPE

This specification covers the requirements for the connector (SFW\_\_S-2ST\_E\_LF) 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. APPLICABLE STANDARDS

- JIS C 5402 (IEC 60512) Method for Test of Connectors for Electronic Equipment
- JIS C 0806 Packaging of Electronic Components on Continuous Tapes (Surface Mount Components)
- JIS C 60068 (IEC 60068) Method for Environmental testing
- UL - 94 TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES

### 3. CATALOG No. STRUCTURE



### 4. CONNECTOR SHAPE, DIMENSIONS AND MATERIALS

Refer to product drawings.

### 5. ACCOMMODATED CONDUCTORS (FPC)

Refer to product drawings.

### 6. PACKAGING CONDITION

Refer to product drawings.

### 7. RECOMMENDED MOUNTING PATTERN DIMENSIONS

Refer to product drawings.

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## 8. RATING

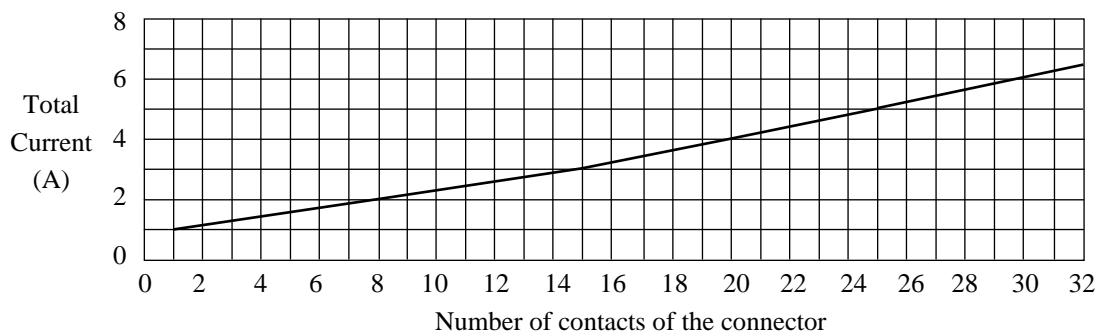
8-1. Voltage : A.C.100V D.C.100V

8-2. Current : A.C.1A D.C.1A (Refer to the following note.)

8-3. Operating Temperature : -55°C ~ +105°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	<p>JIS C 5402-2-1 (IEC60512-2-1)</p> <p>1) Measure contact resistance between V<sub>1</sub>-V<sub>2</sub> by voltage drop method by the following circuit by mating accommodated conductor specified in clause 5 after reflow soldering the connector on the P.C.B.</p> <p>2) Open circuit voltage : Less than A.C.20mV</p> <p>3) Test current : Less than A.C.20mA</p>	<p>1) Initial value : Less than 30mΩ</p> <p>2) Contact resistance after the test is in accordance with the value specified in each test item.</p>

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9-1-2	Insulation resistance	JIS C 5402-3-1 (IEC60512-3-1) 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	JIS C 5402-4-1 (IEC60512-4-1) 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 conductor specified in clause 5. 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 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	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.

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### 9-3. Environmental Performance

No.	Test Item	Test Method	Requirements
9-3-1	Damp heat (Steady state)	<p>JIS C 60068-2-78 (IEC60068-2-78)</p> <p>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.</p> <p>2) Measure insulation resistance after the test by the method in clause 9-1-2.</p> <p>3) Bath temperature : 40°C</p> <p>4) Bath humidity : 90 ~ 95%(relative humidity)</p> <p>5) Period of exposure : 48 hours</p> <p>6) Expose conductor and connector in mated condition and leave them under normal temperature. (Without insertion and separation)</p>	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p> <p>3) Insulation resistance after the test : More than 100MΩ</p>
9-3-2	Salt spray	<p>JIS C 60068-2-11 (IEC60068-2-11)</p> <p>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.</p> <p>2) Salt solution concentration : 5%</p> <p>3) Period of exposure : 48 hours</p> <p>4) Expose conductor and connector in mated condition and leave them under normal temperature after posttreatment. (24 hours)</p>	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p>

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9-3-3	Change of temperature	<p>JIS C 0025 (IEC60068-2-14)</p> <p>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.</p> <p>2) One cycle of temperature is as follow and test 5 cycles.</p> <table border="1"> <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> <p>3) Expose conductor and connector in mated condition and leave them under normal temperature.</p>	Step	Temp.(°C)	Time(min.)	1	-55±3	30	2	25±2	2 ~ 3	3	85±2	30	4	25±2	2 ~ 3	<p>1) Initial contact resistance : Less than 30mΩ</p> <p>2) Contact resistance after the test : Less than 50mΩ</p> <p>3) Free from any defect such as crack, warping and deformation etc. on each portion the connector.</p>
Step	Temp.(°C)	Time(min.)																
1	-55±3	30																
2	25±2	2 ~ 3																
3	85±2	30																
4	25±2	2 ~ 3																

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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±5 s</p> <p>3) Soldering : 220°C min. 60s max.</p> <p>4) Peak : 245°C min. 20s max. (Peak 255°C max.)</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>5) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5</p>	<p>1) Contact resistance after the test : Less than 50mΩ</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>	



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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>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>	1) Actual soldered area must be more than 95% of the dipped area intended to be soldered.
		<p><u>Diagram B</u></p> <p style="text-align: center;">Solderability profile</p>	
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 0.68N/contact for recommended cable (More than 70g/contact for recommended cable)

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## 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 FCI packaging specification.

## 11. REMARKS

- 11-1. Retention force for accommodated conductor specified in clause 9-4-3 differs due to different thickness, structure and surface treatment of conductor. Therefore, the value of retention force specified in the clause for performance is reference value.
- 11-2. Since this connector cannot be used for CIC (Conductor such as silver paste, carbon etc.) as accommodated conductor, please consult us separately.
- 11-3. Please refer to the "Handling procedures and remarks" before use.

## 12. RECOMMENDED REFLOW PROFILE

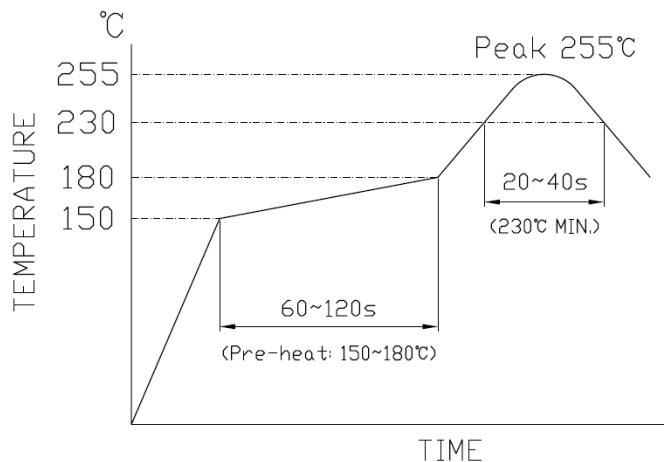


Diagram C. Recommended reflow temperature profile

Note: Please check the reflow soldering condition for your own application beforehand due to different conditions with soldering devices, P.C. Boards, etc.  
No moisture treatment before reflow process.

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### 13. REVISION RECORD

REV.	PAGE	DESCRIPTION	ECR #	DATE
A	All	New release	J05-0377	06/24/'05
B	All	Format Change	ELX-J-011721	05/24/'12
	4	Change operation temperature from -55 to 85degC to -55 to 105degC		
	5,6	Match with JIS/IEC number		
	7,8	Change reflow test condition (9-4-1), (9-4.2)		
	9	Add recommended reflow profile		
C	All	Format change	ELX-J-50304	01/09/'24
	3	Add IEC60512 and JIS 60068 (IEC60068) in item2		
	4,5	Add JIS5402(IEC60512) in 9-1-1, 9-1-2, 9-1-3		
	9	Consolidated the conductor retention force spec (reference value)		