| NUMBER | TYPE | |
|---|---|---|
| SC-SFW 10 | PRODUCT SPECIFICATION | FCI |

| TITLE | PAGE | REVISION |
|---|---|---|
| FPC/FFC CONNECTOR<br>(SFW_ _R-1/2STE_ LF / SFW_ _R-1/2STZE_ LF) | 1 of 11 | E |
| | AUTHORIZED BY: M.YAMASHITA | DATE: 24 Nov 09 |
| | CLASSIFICATION: UNRESTRICTED | |

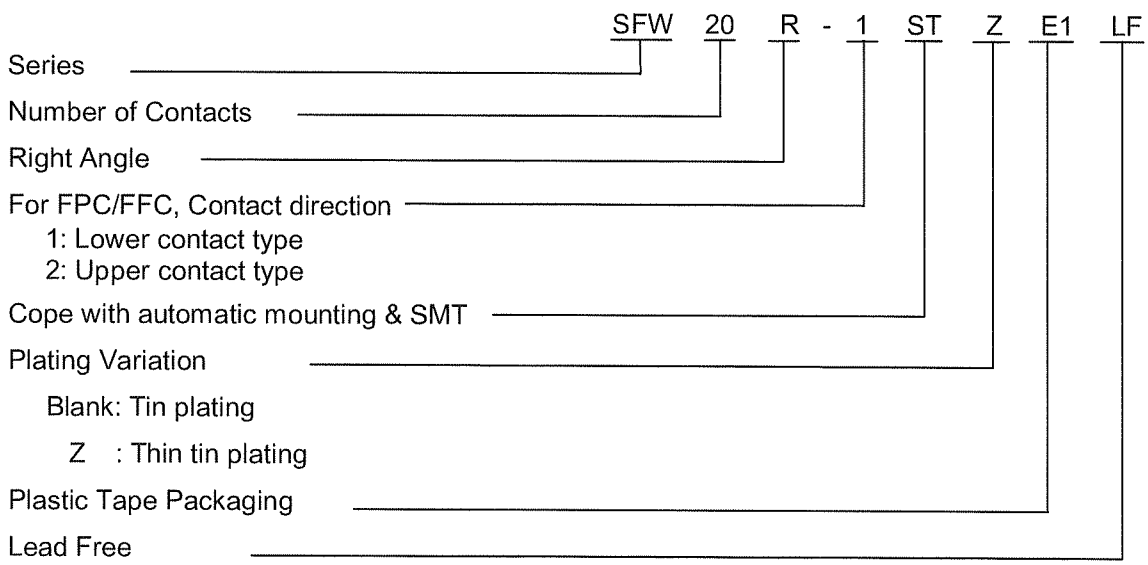
# Table of Contents:

1. SCOPE
This specification covers the requirements for the connector (SFW_ _R-1/2ST_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 | 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




4. CONNECTOR SHAPE, DIMENSIONS AND MARTERIALS
Refer product drawings.

5. ACCOMMODATED CONDUCTORS (FPC/FFC)
Refer product drawings.

6. PACKAGING CONDITION
Refer product drawings.

7. RECOMMENDED MOUNTING PATTERN DIMENSIONS
Refer product drawings.

8. RATING

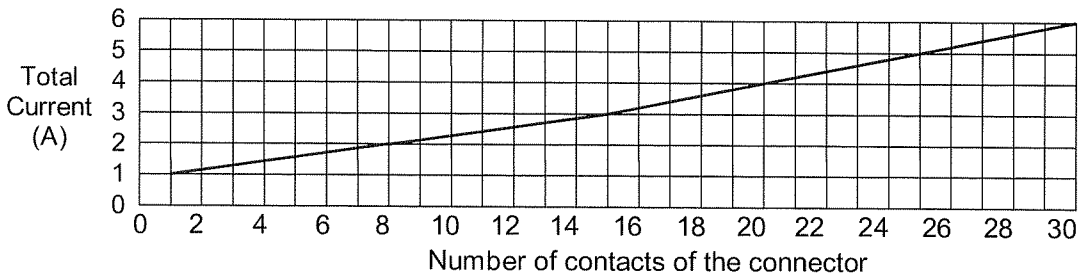
8-1. Voltage : A.C. 100V D.C. 100V

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

8-3. Operating Temperature : -55°C ~ +105°C (Including terminal temperature rise)

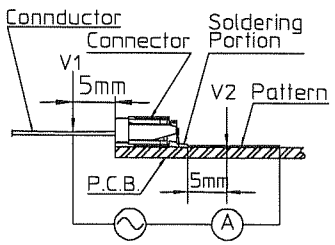
NOTE

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.C.B. and cleaning flux dregs.<br>  <br><br>2) Open circuit voltage : Less than A.C. 20mV<br>3) Test current : Less than A.C. 20mA | 1) Initial value : Less than 30mΩ<br>2) Contact resistance after the test Is in accordance with the value specified in each test item. |

| No. | Test Item | Test Method | Requirements |
|---|---|---|---|
| 9-1-2 | Insulation resistance | 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. | 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.<br>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.<br>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<br>2) Contact resistance after the test : Less than 50mΩ<br>3) Free from any defect such as break etc. on the connector and the conductor. |
| 9-2-2 | Vibration (Sinusoidal) | JIS C 60068-2-6 (IEC60068-2-6)<br>1) Frequency range : 10 ~ 500Hz<br>2)Amplitude : 0.75mm or Acceleration : 100m/s$^2$<br>3) Sweep rate : 1 octave / minute<br>4) Kind of test : Sweep endurance test<br>5) Test time : 10 cycles | 1) During the test, no circuit opening for more than 1μs<br>2) Free from any defect such as break, deformation, loosing and falling off etc. on each portion of the connector. |

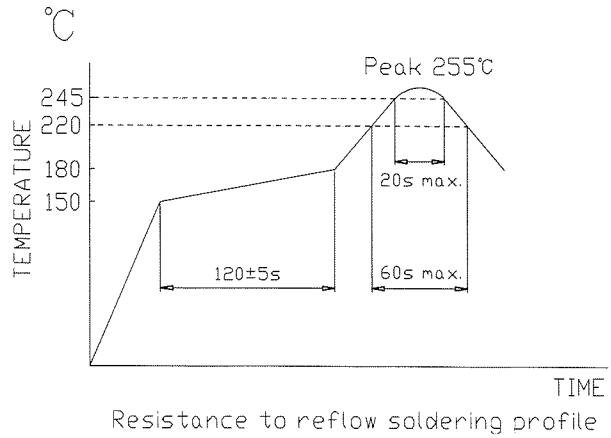
9-3. Environmental Performance

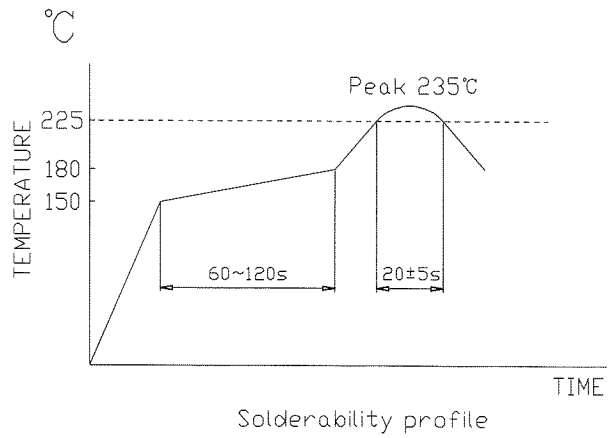
| No. | Test Item | Test Method | Requirements |
|---|---|---|---|
| 9-3-1 | Damp heat (Steady state) | JIS C 60068-2-78 (IEC60068-2-78)<br>1) Measure contact resistance before and after the test by the method in clause 9-1-1 by using the accommodated conductor specified in clause 5.<br>2) Measure insulation 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 using 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 post treatment. | 1) Initial contact resistance : Less than 30mΩ<br>2) Contact resistance after the test : Less than 50mΩ |

| No. | Test Item | Test Method | Requirements |
|---|---|---|---|
| 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 using accommodated conductor in clause 5.<br><br>2) One cycle of temperature is as follow and test 5 cycles.<br><br>3) Expose conductor and connector in mated condition and leave them under normal temperature. | 1) Initial contact resistance : Less than 30mΩ<br><br>2) Contact resistance after the test : Less than 50mΩ<br><br>3) Free from any defect such as crack, warping and deformation etc. on each portion of 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) | JIS C 60068-2-58 (IEC60068-2-58)<br>1) Solder by setting reflow bath on the following condition.<br><br>2) Preheating : 150~180°C, 120±5s<br><br>3) Soldering : 220°C min. 60s max.<br><br>4) Peak : 245°C min. 20s max.<br>(Peak 255°C max.)<br>(See Diagram A)<br>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.<br><br>5) Solder paste to be used is<br>JIS Z 3282<br>Sn96.5Ag3.0Cu0.5 | 1) Contact resistance after the test : Less than 50mΩ<br><br>2) Insulation resistance after the test : More than 100MΩ<br><br>3) No short circuit and insulation Breakdown for dielectric withstanding voltage test after this test.<br><br>4) Free from any damage on performance and contact performance after soldering. |
| | | Diagram A<br>  <br><br>Resistance to reflow soldering profile | |

| No. | Test Item | Test Method | Requirements |
|---|---|---|---|
| 9-4-2 | Soldering (Solderability) (Reflow) | JIS C 60068-2-58 (IEC60068-2-58)<br>1) Solder by setting reflow bath on the following condition.<br><br>2) Preheating: 150~180°C, 60~120s<br><br>3) Soldering : 225°C min., 20±5s<br>(Peak 235°C max.)<br>(See Diagram B)<br>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.<br><br>4) Solder paste to be used is<br>JIS Z 3282<br>Sn96.5Ag3.0Cu0.5 | 1) Actual soldered area must be more than 95% of the dipped area intended to be soldered. |
| | | Diagram B<br>  <br><br>Solderability profile | |
| 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 90gf/contact for FPC)<br><br>2) More than 0.68N/contact for FFC (More than 70gf/contact for FFC) |

## 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. Please refer to the "Handling procedures and remarks" before use.

11-2. 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.

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

## 12. RECOMMENDED REFLOW PROFILE

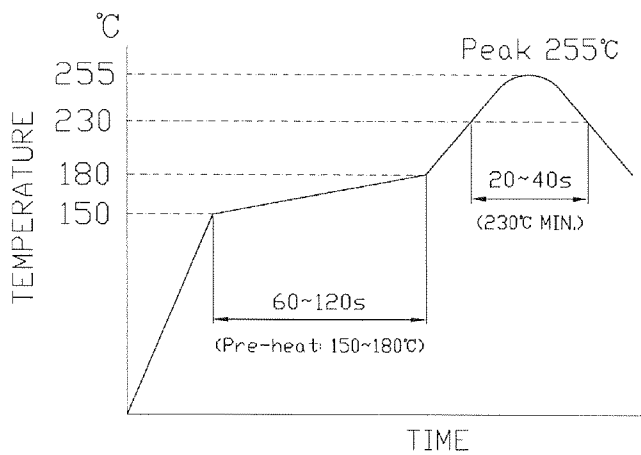



Diagram C. Recommended reflow temperature profile

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.

13. REVISION RECORD

| REV. | PAGE | DESCRIPTION | ECR # | DATE |
|---|---|---|---|---|
| | All | New release | J03-0327 | 04 Sep 03 |
| A | All | Spec update | J05-0055 | 07 Feb 05 |
| B | 5 | Correct solder operation to slider operation | J06-0080 | 01 Mar 06 |
| C | All<br><br>3 | Revise format of product spec.<br>Operating Temperature change from -55°C ~ +85°C to -55°C ~ +105°C | S07-0192 | 21 Mar 07 |
| D | All | Revise spec for lead-free solder<br>Add "Diagram A" Resistance to Reflow Soldering Profile.<br>Add "Diagram B" Solderability Profile.<br>Add "Diagram C" Recommended Reflow Profile. | J09-0371 | 16 Oct 09 |
| E | 11 | Corrected paragraph Number. | J09-0410 | 24 Nov 09 |

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

FCI / Amphenol:

SFW10R-2STE1LF SFW30R-2STE1LF SFW4R-1STE1LF SFW18R-2STE1LF SFW10R-1STE1LF SFW11R-1STE1LF SFW12R-2STE1LF SFW13R-2STE1LF SFW14R-1STE1LF SFW14R-2STE1LF SFW15R-1STE1LF SFW15R-2STE1LF SFW16R-1STE1LF SFW16R-2STE1LF SFW17R-1STE1LF SFW17R-2STE1LF SFW18R-1STE1LF SFW19R-2STE1LF SFW20R-1STE1LF SFW20R-2STE1LF SFW21R-1STE1LF SFW22R-2STE1LF SFW23R-2STE1LF SFW24R-1STE1LF SFW24R-2STE1LF SFW25R-1STE1LF SFW26R-1STE1LF SFW26R-2STE1LF SFW27R-1STE1LF SFW27R-2STE1LF SFW28R-1STE1LF SFW28R-2STE1LF SFW30R-1STE1LF SFW4R-2STE1LF SFW5R-1STE1LF SFW5R-2STE1LF SFW6R-1STE1LF SFW6R-2STE1LF SFW7R-1STE1LF SFW7R-2STE1LF SFW8R-1STE1LF SFW8R-2STE1LF SFW9R-1STE1LF SFW9R-2STE1LF SFW11R-2STE1LF SFW13R-1STE1LF SFW19R-1STE1LF SFW21R-2STE1LF SFW23R-1STE1LF SFW25R-2STE1LF SFW29R-1STE1LF SFW29R-2STE1LF SFW8R-2STE5LF SFW20R-1STE5LF SFW10R-2STE9LF SFW14R-1STE9LF SFW14R-2STE9LF SFW16R-1STE9LF SFW18R-1STE9LF SFW18R-2STE9LF SFW24R-2STE9LF SFW28R-1STE9LF SFW28R-2STE9LF SFW30R-2STE9LF SFW5R-2STE9LF SFW6R-1STE9LF SFW6R-2STE9LF SFW7R-1STE9LF SFW7R-2STE9LF SFW8R-1STE9LF SFW8R-2STE9LF SFW11R-1STZE1LF SFW11R-2STZE1LF SFW12R-1STE5LF SFW8R-2STZE1LF SFW27R-1STE9LF SFW10R-1STE9LF SFW12R-1STE9LF SFW12R-2STE9LF SFW16R-2STE9LF SFW20R-1STE9LF SFW20R-2STE9LF SFW24R-1STE9LF SFW30R-1STE9LF SFW4R-1STE9LF SFW4R-2STE9LF SFW5R-1STE9LF SFW20R-1STZE1LF SFW20R-2STZE1LF SFW6R-2STZE1LF SFW17R-1STE5LF SFW15R-2STE5LF SFW17R-2STE5LF