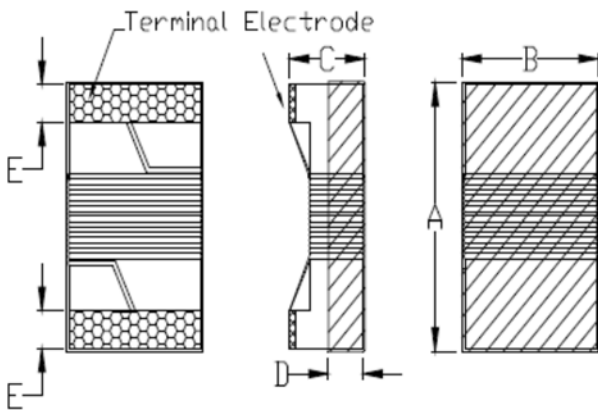


## FEATRLRES

- Monolithic inorganic material construction.
- Closed magnetic circuit avoids crosstalk.
- S.M.T. type.
- Suitable for reflow soldering.
- Shapes and dimensions follow E.I.A. spec.
- Available in various sizes.
- Excellent solder ability and heat resistance.
- High reliability.
- 100% Lead(Pb) & Halogen-Free and RoHS compliant.

## CONFIGLRATIONS & DIMENSIONS ( unit in mm )



| Size    | A      | B      | C      | D        | E        |
|---------|--------|--------|--------|----------|----------|
| SWF1608 | 1.8max | 1.2max | 1.2max | 0.38ref. | 0.35±0.1 |

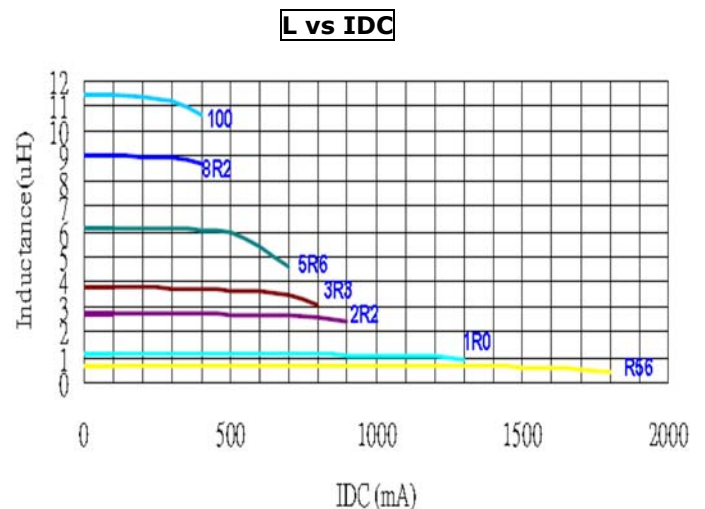
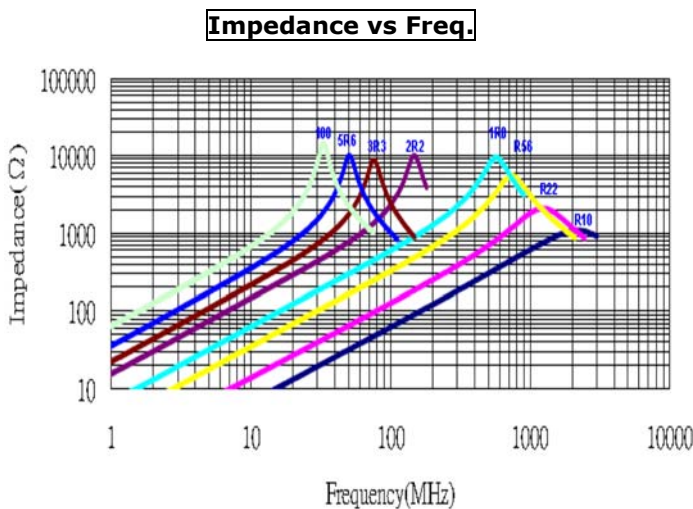
## ELECTRICAL CHARACTERISTICS

| Part Number    | Inductance<br>(uH) | Tolerance | Test Frequency<br>(Hz) | Q<br>min. | Test Frequency<br>(MHz) | Rated<br>Current(mA) | DCR(Ω)<br>max. | SRF<br>(MHz)min. |
|----------------|--------------------|-----------|------------------------|-----------|-------------------------|----------------------|----------------|------------------|
| SWF1608CF-47NK | 0.047±10%          | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 1500                 | 0.075          | 1400             |
| SWF1608CF-R10K | 0.10±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 1150                 | 0.13           | 1400             |
| SWF1608CF-R12K | 0.12±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 1100                 | 0.15           | 1400             |
| SWF1608CF-R15K | 0.15±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 1050                 | 0.15           | 1300             |
| SWF1608CF-R18K | 0.18±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 950                  | 0.15           | 1300             |
| SWF1608CF-R22K | 0.22±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 800                  | 0.15           | 950              |
| SWF1608CF-R24K | 0.24±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 800                  | 0.31           | 620              |
| SWF1608CF-R27K | 0.27±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 775                  | 0.20           | 710              |
| SWF1608CF-R33K | 0.33±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 725                  | 0.35           | 620              |
| SWF1608CF-R39K | 0.39±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 620                  | 0.39           | 600              |
| SWF1608CF-R47K | 0.47±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 540                  | 0.43           | 570              |
| SWF1608CF-R56K | 0.56±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 525                  | 0.47           | 550              |
| SWF1608CF-R68K | 0.68±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 460                  | 0.52           | 470              |
| SWF1608CF-R82K | 0.82±10%           | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 410                  | 0.69           | 400              |
| SWF1608CF-1R0K | 1.0±10%            | K,M       | 0.5V/7.96M             | 10        | 7.96                    | 190                  | 0.81           | 400              |

|                |          |     |            |    |      |     |      |     |
|----------------|----------|-----|------------|----|------|-----|------|-----|
| SWF1608CF-1R2K | 1.2±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 160 | 0.87 | 370 |
| SWF1608CF-1R5K | 1.5±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 100 | 0.96 | 350 |
| SWF1608CF-1R8K | 1.8±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 80  | 1.10 | 350 |
| SWF1608CF-2R2K | 2.2±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 68  | 1.20 | 320 |
| SWF1608CF-3R3K | 3.3±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 42  | 1.50 | 280 |
| SWF1608CF-3R9K | 3.9±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 40  | 1.50 | 280 |
| SWF1608CF-4R7K | 4.7±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 34  | 2.10 | 260 |
| SWF1608CF-5R6K | 5.6±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 32  | 2.60 | 240 |
| SWF1608CF-6R8K | 6.8±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 31  | 3.10 | 200 |
| SWF1608CF-8R2K | 8.2±10%  | K,M | 0.5V/7.96M | 10 | 7.96 | 26  | 4.40 | 190 |
| SWF1608CF-100K | 10.0±10% | K,M | 0.5V/2.52M | 10 | 2.52 | 25  | 4.80 | 180 |

- NOTE: K=±10%,L=±15%,M=±20%
- Rated current: based on temperature rise test
- In compliance with EIA 595

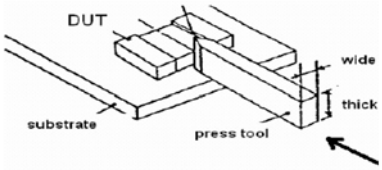
## Impedance vs Frequency,DC Bias Characteristics(Typical)



## Reliability and Test Condition

| Item                               | Performance   | Test Condition                                      |
|------------------------------------|---|---|
| Operating temperature              | -40~+125°C (Including self - temperature rise)                          |   |
| Storage temperature                | 1. -10~+40°C,50~60%RH (Product with taping)<br>2. -40~+125°C (on board) |   |
| <b>Electrical Performance Test</b> |   |   |
| Inductance                         | Refer to standard electrical characteristics list.                      | HP4284A,CH11025,CH3302,CH1320,CH1320S<br>LCR Meter. |
| DCR                                |   | CH16502,Agilent33420A Micro-Ohm Meter.              |

| Saturation Current (Isat)         | Approximately $\Delta L30\%$   | Saturation DC Current (Isat) will cause L0 to drop $\Delta L(\%)$  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
|-----------------------------------|--|--|-----------------------------------|---------------------------|--|-----------------------|---------------------------|------------|---------------------|----|-----------|------|------|----|----|-----------|------|
| Heat Rated Current (Irms)         | Approximately $\Delta T40^{\circ}\text{C}$   | Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(^{\circ}\text{C})$ .<br>1. Applied the allowed DC current<br>2. Temperature measured by digital surface thermometer   |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| <b>Reliability Test</b>           |  |  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Life Test                         |  | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles)<br>Temperature : $125\pm 2^{\circ}\text{C}$ (Inductor)<br>Applied current : rated current<br>Duration : 1000 $\pm$ 12hrs<br>Measured at room temperature after placing for 24 $\pm$ 2 hrs   |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Load Humidity                     |  | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles)<br>Humidity : $85\pm 2 \times \text{R.H.}$ ,<br>Temperature : $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$<br>Duration : 1000hrs Min. with 100% rated current<br>Measured at room temperature after placing for 24 $\pm$ 2 hrs  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Moisture Resistance               | Appearance : No damage.<br>Inductance : within $\pm 10\%$ of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value   | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles<br>1. Baked at $50^{\circ}\text{C}$ for 25hrs, measured at room temperature after placing for 4 hrs.<br>2. Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}\text{C}$ in 2.5hrs.<br>3. Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}\text{C}$ in 2.5hrs, keep at $25^{\circ}\text{C}$ for 2 hrs then keep at $-10^{\circ}\text{C}$ for 3 hrs<br>4. Keep at $25^{\circ}\text{C}$ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs. |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Thermal shock                     |  | Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles<br>Condition for 1 cycle<br>Step1 : $-40\pm 2^{\circ}\text{C}$ 30 $\pm$ 5min<br>Step2 : $25\pm 2^{\circ}\text{C}$ $\leq 0.5$ min<br>Step3 : $125\pm 2^{\circ}\text{C}$ 30 $\pm$ 5min<br>Number of cycles : 500<br>Measured at room temperature after placing for 24 $\pm$ 2 hrs  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Vibration                         |  | Oscillation Frequency: 10 ~ 2K ~ 10Hz for 20 minutes<br>Equipment : Vibration checker<br>Total Amplitude: 1.52mm $\pm 10\%$<br>Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations).  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Bending                           |  | Shall be mounted on a FR4 substrate of the following dimensions: $\geq 0805$ inch(2012mm):40x100x1.2mm<br>$< 0805$ inch(2012mm):40x100x0.8mm<br>Bending depth: $\geq 0805$ inch(2012mm):1.2mm<br>$< 0805$ inch(2012mm):0.8mm<br>duration of 10 sec.  |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Shock                             | Appearance : No damage.<br>Impedance : within $\pm 15\%$ of initial value<br>Inductance : within $\pm 10\%$ of initial value<br>Q : Shall not exceed the specification value.<br>RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value | <table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (V)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table>  | Type                              | Peak value (g's)          | Normal duration (D) (ms)                     | Wave form             | Velocity change (V)ft/sec | SMD        | 50                  | 11 | Half-sine | 11.3 | Lead | 50 | 11 | Half-sine | 11.3 |
| Type                              | Peak value (g's)   | Normal duration (D) (ms)   | Wave form                         | Velocity change (V)ft/sec |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| SMD                               | 50   | 11   | Half-sine                         | 11.3                      |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Lead                              | 50   | 11   | Half-sine                         | 11.3                      |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Solder ability                    | More than 95% of the terminal electrode should be covered with solder.   | Preheat: $150^{\circ}\text{C}$ , 60sec.<br>Solder: Sn96.5% Ag3% Cu0.5%<br>Temperature: $245\pm 5^{\circ}\text{C}$<br>Flux for lead free: Rosin. 9.5%<br>Dip time: 4 $\pm$ 1sec<br>Depth: completely cover the termination<br>Depth: completely cover the termination   |                                   |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| Resistance to Soldering Heat      |  | <table border="1"> <thead> <tr> <th>Temperature(<math>^{\circ}\text{C}</math>)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td><math>260 \pm 5</math> (solder temp)</td> <td>10 <math>\pm</math> 1</td> <td>25mm/s <math>\pm 6</math> mm/s</td> <td>1</td> </tr> </tbody> </table>  | Temperature( $^{\circ}\text{C}$ ) | Time(s)                   | Temperature ramp/immersion and emersion rate | Number of heat cycles | $260 \pm 5$ (solder temp) | 10 $\pm$ 1 | 25mm/s $\pm 6$ mm/s | 1  |           |      |      |    |    |           |      |
| Temperature( $^{\circ}\text{C}$ ) | Time(s)  | Temperature ramp/immersion and emersion rate   | Number of heat cycles             |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |
| $260 \pm 5$ (solder temp)         | 10 $\pm$ 1   | 25mm/s $\pm 6$ mm/s  | 1                                 |                           |  |                       |                           |            |                     |    |           |      |      |    |    |           |      |

|                          |  |  |
|--------------------------|--|--|
| <p>Terminal Strength</p> | <p>Appearance : No damage.<br/>         Impedance : within <math>\pm 15\%</math> of initial value<br/>         Inductance : within <math>\pm 10\%</math> of initial value<br/>         Q : Shall not exceed the specification value.<br/>         RDC : within <math>\pm 15\%</math> of initial value and shall not exceed the specification value e</p> | <p>Preconditioning: Run through IR reflow for 2 times. (IPC/JEDEC J-STD-020D Classification Reflow Profiles)<br/>         With the component mounted on a PCB with the device to be tested, apply a force (<math>&gt;0.805:1\text{kg}</math> , <math>\leq 0.805:0.5\text{kg}</math>) to the side of a device being tested. This force shall be applied for <math>60 \pm 1</math> seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.</p>  |
|--------------------------|--|--|

Note : When there are questions concerning measurement result : measurement shall be made after  $48 \pm 2$  hours of recovery under the standard condition.