# WIREWOUND CHIP INDUCTORS

## *SDI321618 SERIES*

**1. PART NO. EXPRESSION :**

**S D I 3 2 1 6 1 8 - R 1 2 M F**

(a) (b) (c) (d)(e)

(a) Series code

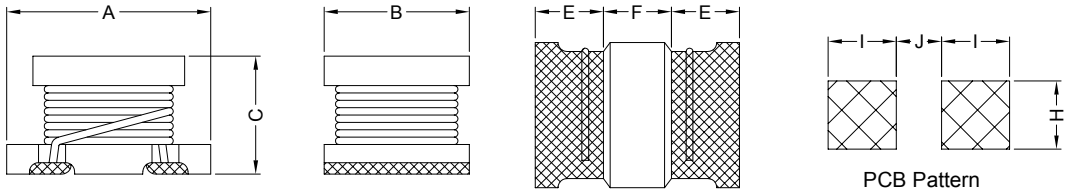
(b) Dimension code

(c) Inductance code : R12 = 0.12uH

(d) Tolerance code : J = ±5%, K = ±10%, M = ±20%

(e) F : Lead Free

**2. CONFIGURATION & DIMENSIONS :**

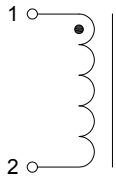



PCB Pattern

Unit:m/m

| A | B | C | E | F | H | I | J |
|---|---|---|---|---|---|---|---|
| 3.2±0.3 | 1.6±0.2 | 1.8±0.3 | 0.7 Min. | 0.7 Min. | 1.5 Ref. | 1.5 Ref. | 1.0 Ref. |

**3. SCHEMATIC :**




**4. GENERAL SPECIFICATION :**

a) Ambient temp. : 20°C

b) Operating temp. : -25°C to 85°C

c) Rated current : Base on temp. rise & ΔL/L0A=10% Max.

RoHS Compliant

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**5. ELECTRICAL CHARACTERISTICS :**

| Part No. | Inductance ( uH ) | Tolerance | Test Frequency ( Hz ) | SRF ( MHz ) Min. | DCR ( Ω ) Max. | IDC ( mA ) Max. |
|---|---|---|---|---|---|---|
| SDI321618-R12□F | 0.12 | M | 1M | 250 | 0.112 | 970 |
| SDI321618-R22□F | 0.22 | M | 1M | 250 | 0.140 | 850 |
| SDI321618-R47□F | 0.47 | M | 1M | 180 | 0.210 | 700 |
| SDI321618-1R0□F | 1.0 | M | 1M | 100 | 0.364 | 510 |
| SDI321618-2R2□F | 2.2 | M | 1M | 50 | 0.533 | 430 |
| SDI321618-4R7□F | 4.7 | K, M | 1M | 31 | 0.845 | 340 |
| SDI321618-100□F | 10 | J, K | 1M | 20 | 1.690 | 230 |
| SDI321618-220□F | 22 | J, K | 1M | 14 | 3.900 | 160 |
| SDI321618-470□F | 47 | J, K | 1M | 10 | 10.40 | 100 |
| SDI321618-101□F | 100 | J, K | 1M | 7.0 | 15.60 | 80 |

Tolerance code :

□ : J = ±5%

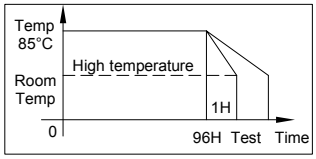
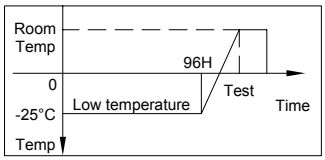
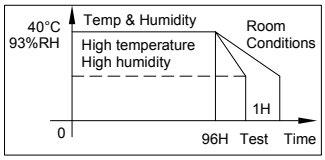
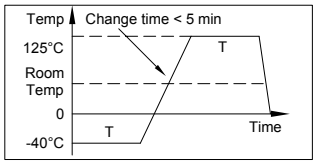
K = ±10%

M = ±20%

RoHS Compliant

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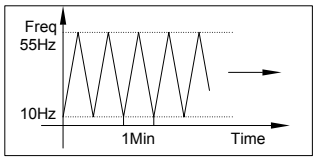
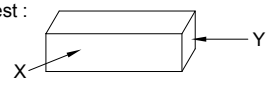
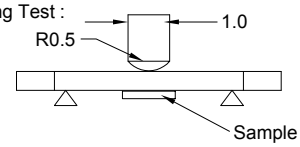
**6. RELIABILITY AND TEST CONDITION :**

| ITEM | PERFORMANCE | TEST CONDITION |
|---|---|---|
| Environmental Tests | | |
| High Temperature Storage Test<br><br>Reference documents:<br>MIL-STD-202G Method 108A | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Temperature : 85±2°C<br>Time : 96±2 hours<br>Tested after 1 hour (less than 2 hours) at room temperature<br> |
| Low Temperature Storage Test<br><br>Reference documents:<br>IEC 68-2-1A 6.1 6.2 | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Temperature : -25±2°C<br>Time : 96±2 hours<br>Tested after 1 hour (less than 2 hours) at room temperature<br> |
| Humidity Test<br><br>Reference documents:<br>MIL-STD-202G Method 103B | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Dry oven at temperature of 40±5°C for 24 hours<br>Measured after 24 hours<br>Exposure : Temperature : 40±2°C, Humidity : 93±3% RH,<br>Time : 96±2 hours<br>Tested while the specimens are still in the chamber<br>Tested after 1 hour (less than 2 hours) at room temperature<br> |
| Thermal shock test<br><br>Reference documents:<br>MIL-STD-202G Method 107G | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10%<br>T : weight≦ 28g : 15 Min.<br>28g≦weight≦136g : 30 Min. | Conditions of 1 cycle :<br>Step 1 : -40°C for T time<br>Step 2 : 125°C for T time<br>Total : 20 cycles<br> |
| Physical Characteristics Tests | | |
| Solderability Test<br><br>Reference documents:<br>MIL-STD-202G Method 208H<br>IPC J-STD-002B | More than 95% of terminal electrode should be covered with solder. | Solder temperature : 245±5°C<br>Dip time : 5 secs.<br>Solder : Sn(63)/Pb(37)<br>Flux : rosin flux |

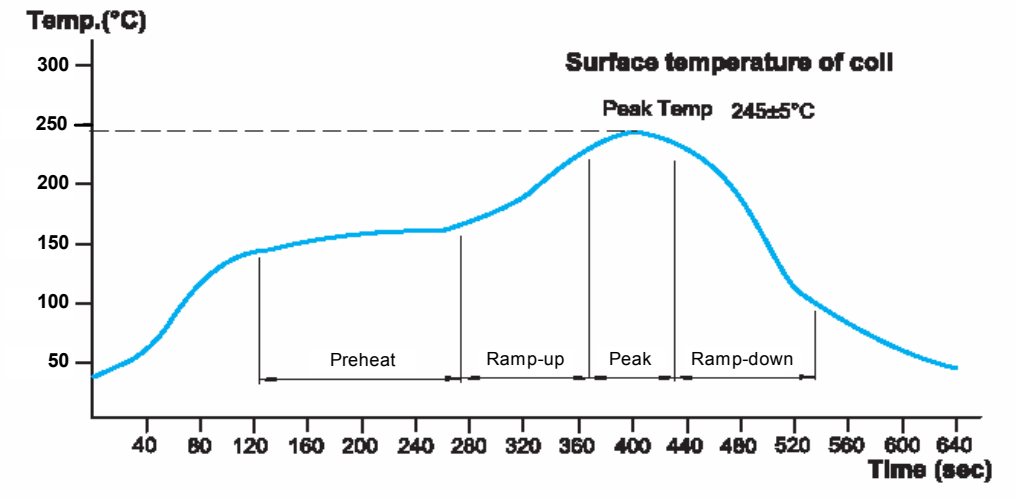
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**6. RELIABILITY AND TEST CONDITION :**

| ITEM | PERFORMANCE | TEST CONDITION |
|---|---|---|
| Heat Endurance of Reflow Soldering<br>Reference documents: IPC J-STD-020B | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Refer to reflow curve.<br>No. of cycle : 3<br>Peak temp. : 245±5°C |
| Vibration Test<br>Reference documents: MIL-STD-202G Method 201A | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Frequency : 10~55Hz<br>Amplitude : 0.75mm<br>Directions & times : X, Y, Z directions for 2 hours.<br>A period of 2 hours in each of 3 mutually perpendicular directions (Total 6 hours).<br> |
| Drop Test<br>Reference documents: MIL-STD-202G Method 203C | 1. No case deformation or change in appearance.<br>2. ΔL/L≦30% (Closed Magnetic Circuit)<br>ΔL/L≦10%<br>3. ΔQ/Q ≦ 30%<br>4. ΔDCR/DCR≦10% | Drop from a height of 1m with 981m/s² (100G) altitude (1 angle, 1 ridge and 2 surface orientations) |
| Terminal Strength Push Test<br>Reference documents: JIS C 5321:1997 | Pulling Test :<br>A : Sectional area of terminal<br>Force / Time (sec):<br>A≦8mm² — ≧5N — 30<br>8mm²<A≦20mm² — ≧10N — 10<br>20mm²<A — ≧20N — 10<br>Bending Test : The terminal electrode & the dielectric must not be damaged by the forces applied on the right conditions. | Bend PCB at middle point, the deflection shall be 2mm.<br>Pulling Test :<br><br>Bending Test :<br> |

**Reflow Curve**

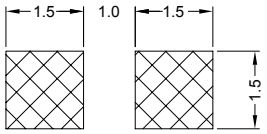



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## 7. SOLDERING AND MOUNTING :

### 7-1. Recommended PC Board Pattern




### 7-2. Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. Our terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

#### 7-2.1 Solder Re-flow :

Recommended temperature profiles for re-flow soldering in Figure 1.

#### 7-2.2 Solder Wave :

Wave soldering is perhaps the most rigorous of surface mount soldering processes due to the steep rise in temperature seen by the circuit when immersed in the molten solder wave, typical at 240°C. Due to the risk of thermal damage to products, wave soldering of large size products is discouraged. Recommended temperature profile for wave soldering is shown in Figure 2.

#### 7-2.3 Soldering Iron (Figure 2) :

Products attachment with soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

Note :

a) Preheat circuit and products to 150°C.
b) 280°C tip temperature (max)
c) Never contact the ceramic with the iron tip
d) 1.0mm tip diameter (max)
e) Use a 20 watt soldering iron with tip diameter of 1.0mm
f) Limit soldering time to 3 secs.

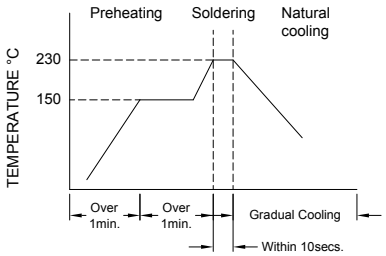



Figure 1. Re-flow Soldering

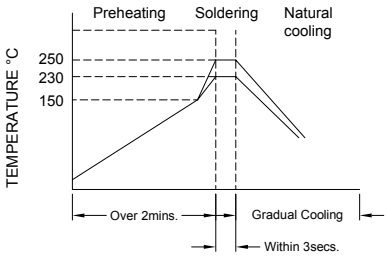



Figure 2. Wave Soldering

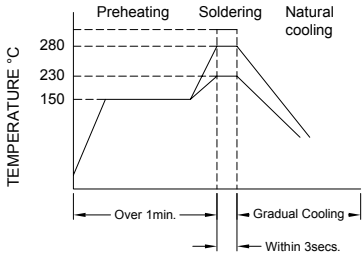


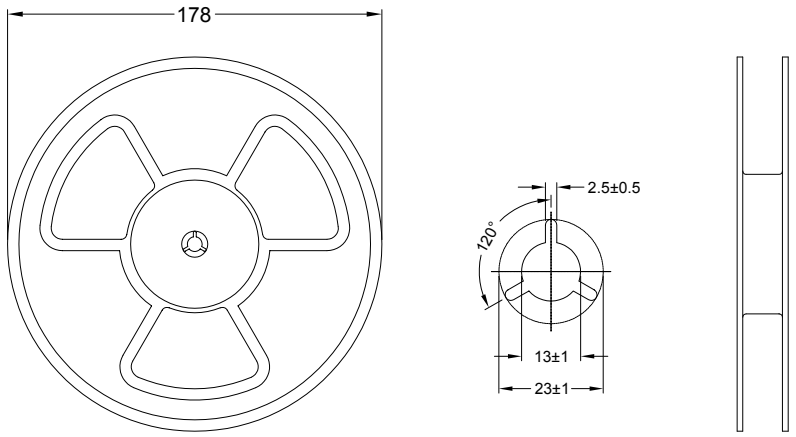

Figure 3. Hand Soldering

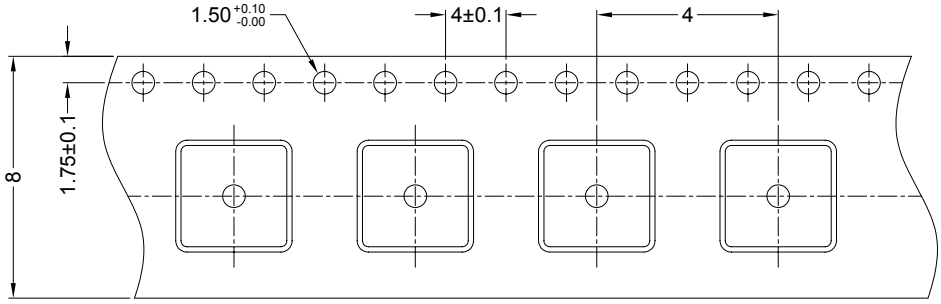
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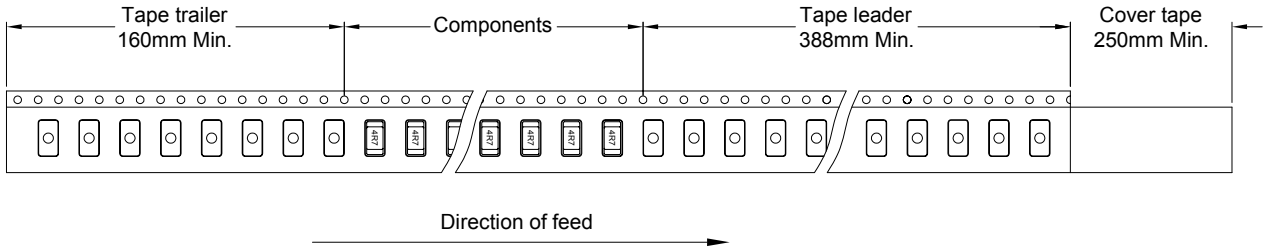
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**8. PACKAGING INFORMATION : ( Unit : mm )**

**8-1. Reel & Tape Dimension**




Direction of feed

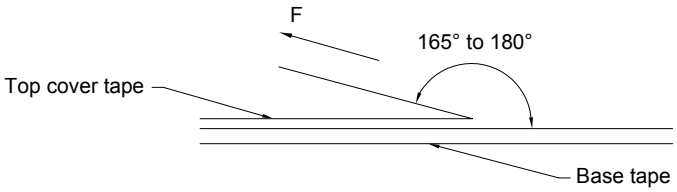
**8-2. Quantity & G.W. per package**

| SERIES | INNER : REEL | | OUTER : CARTON | | |
|---|---|---|---|---|---|
| | Q'TY (PCS) | G.W. (Kg) | Q'TY (PCS) | G.W. (Kg) | SIZE (cm) |
| SDI321618 | 2000 | 0.13 | 120000 | 12 | 39 x 39 x 23 |

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**8-3. Tearing Off Force**




The force for tearing off cover tape is 10 to 60 grams in the arrow direction.

## Application Notice

1. Storage Conditions :

To maintain the solderabililty of terminal electrodes :

a) Temperature and humidity conditions : Less than 40°C and 70% RH.

b) Recommended products should be used within 6 months from the time of delivery.

c) The packaging material should be kept where no chlorine or sulfur exists in the air.

2. Transportation :

a) Products should be handled with care to avoid damage or contamination from perspiration and skin oils.

b) The use of tweezers or vacuum pick up is strongly recommended for individual components.

c) Bulk handling should ensure that abrasion and mechanical shock are minimized.

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