

1. PART NO. EXPRESSION :

SDM109N - R25MF

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

(a) Series code

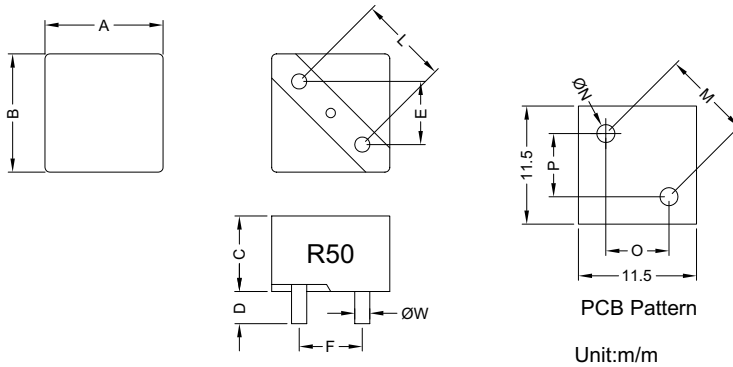
(b) Dimension code

(c) Inductance code : R25 = 0.25uH

(d) Tolerance code : M = ±20%

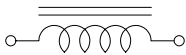
(e) F : Lead Free

2. CONFIGURATION & DIMENSIONS :



| A | B | C | D | E | F |
|-----------|-----------|-----------|----------|----------|----------|
| 10.5 Max. | 10.5 Max. | 10.0 Max. | 3.4±0.5 | 5.3±1.0 | 5.3±1.0 |
| W | L | M | ØN | O | P |
| 1.3±0.1 | 7.5±0.5 | 7.5 Typ. | 1.6 Typ. | 5.3±0.15 | 5.3±0.15 |

3. SCHEMATIC :



4. MATERIALS :

- (a) Core : M-Iron Core
- (b) Wire : Enamelled Copper Wire
- (c) Adhesive : Epoxy

5. FEATURES :

- a) Shielded construction
- b) Frequency up to 1MHz



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6. GENERAL SPECIFICATION :

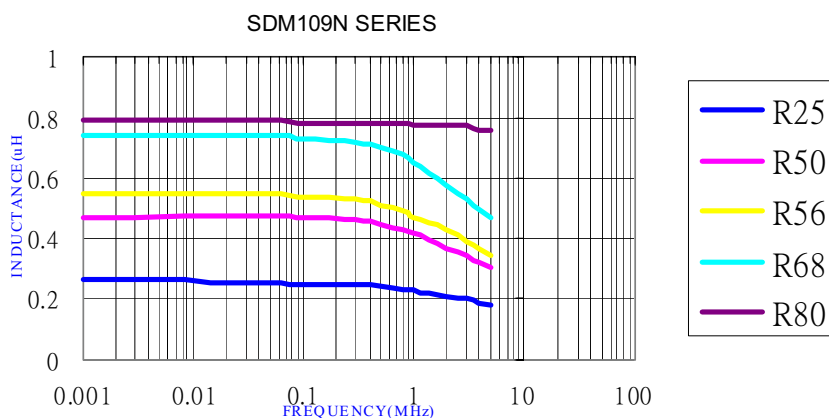
- a) Test Frequency : 100KHz/1.0Vdc
- b) Operating temp. : -25°C to +125°C
- c) Ambient temp. : 25°C
- d) Irms (A) : Will cause an approximately temp. rise $\leq 40^\circ\text{C}$ typ.
- e) Isat (A) : Will cause L₀ to drop approximately 20% typ.
- f) Part temperature (ambient + temp. rise) : Should not exceed 125°C under worst case operating conditions.

7. ELECTRICAL CHARACTERISTICS :

| Part No. | Inductance L ₀ (uH) ±20% @ 0Adc | Q Min. | Irms (A) Typ. | Isat (A) Max. | DCR (mΩ) Max. |
|---------------|---|-----------|-----------------------|-----------------------|-----------------------|
| SDM109N-R25MF | 0.25 | 20 | 35 | 40 | 0.8 |
| SDM109N-R50MF | 0.50 | 20 | 32 | 38 | 1.0 |
| SDM109N-R56MF | 0.56 | 20 | 30 | 35 | 1.0 |
| SDM109N-R68MF | 0.68 | 15 | 30 | 35 | 1.3 |
| SDM109N-R80MF | 0.80 | 15 | 10 | 20 | 1.3 |

8. CHARACTERISTICS CURVES :

Inductance vs. Frequency



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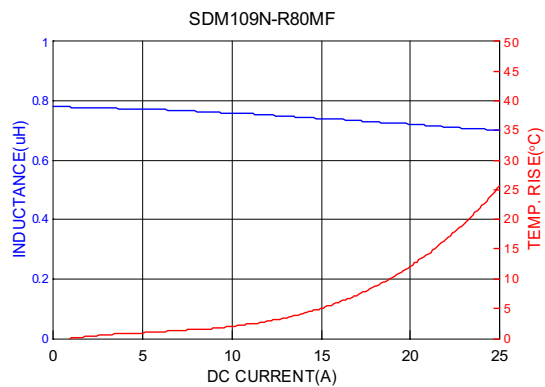
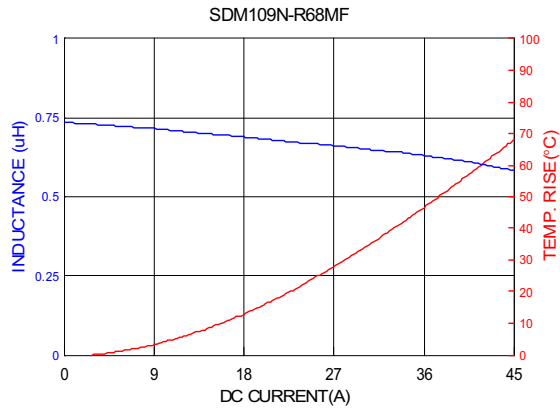
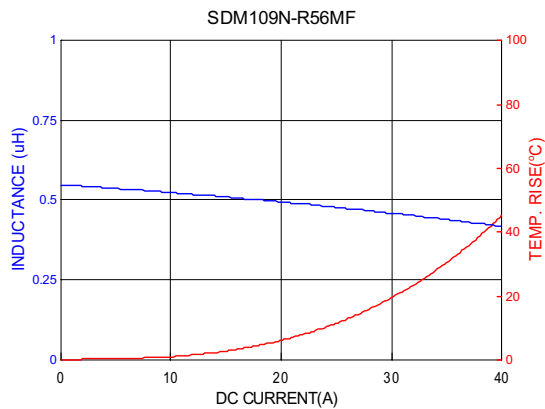
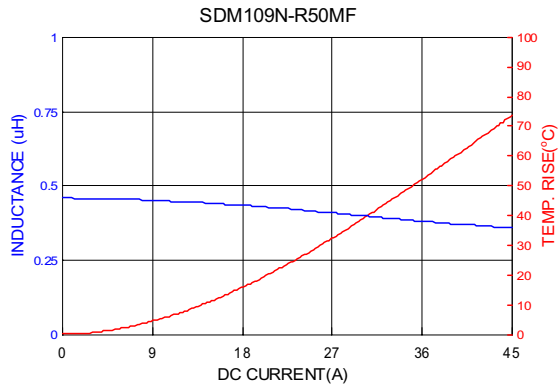
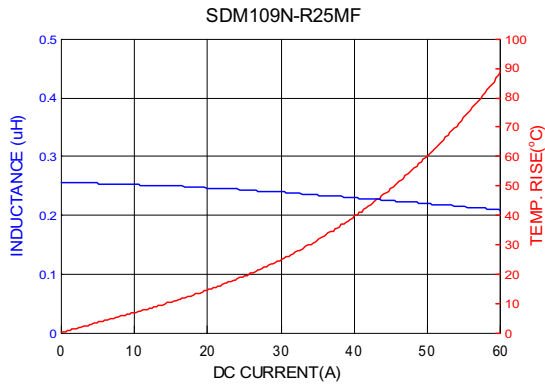


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8. CHARACTERISTICS CURVES :

DC Current vs. Inductance & Temperature Rise



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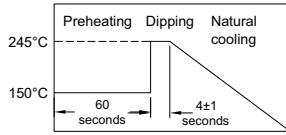
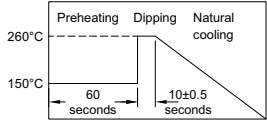
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9. RELIABILITY AND TEST CONDITION :

| ITEM | PERFORMANCE | TEST CONDITION | | | | | | | | | | | | | | |
|---------------------------------|---|--|------|------------------------------------|--------------|---|------------|-----------|---|------------------|----------|---|-----------|-----------|---|------------------|
| Electrical Characteristics Test | | | | | | | | | | | | | | | | |
| Inductance | Refer to standard electrical characteristics list | HP-4192A, HP4284A, CH1320 | | | | | | | | | | | | | | |
| DCR | | Agilent 33420A | | | | | | | | | | | | | | |
| Heat Rated Current (Irms) | | Irms(A) will cause an temp rise $\leq 40^{\circ}\text{C}$ typ. | | | | | | | | | | | | | | |
| Saturation Current (Isat) | | Isat(A) will cause Lo to drop approximately 25% | | | | | | | | | | | | | | |
| Mechanical Performance Test | | | | | | | | | | | | | | | | |
| Solderability Test | More than 90% of the terminal electrode should be covered with solder. |  <p>After fluxing, component shall be dipped in a melted solder bath at $245\pm 5^{\circ}\text{C}$ for 5 seconds</p> | | | | | | | | | | | | | | |
| Solder Heat Resistance | 1. Appearance : No significant abnormality 2. Inductance change : Within $\pm 3\%$ | Preheat : 150°C , 60sec. Solder : Sn99.95-Cu0.05 Solder Temperature : $260\pm 5^{\circ}\text{C}$ Flux : rosin Dip Time : 10 ± 0.5 sec.  | | | | | | | | | | | | | | |
| Reliability Test | | | | | | | | | | | | | | | | |
| High Temperature Life Test | 1. Appearance : No damage 2. Inductance : Within $\pm 3\%$ of initial value. | Temperature : $85\pm 5^{\circ}\text{C}$ Time : 500 ± 12 hours Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber | | | | | | | | | | | | | | |
| Low Temperature Life Test | | Temperature : $-40\pm 5^{\circ}\text{C}$ Time : 500 ± 12 hours Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber | | | | | | | | | | | | | | |
| Thermal Shock | | No disconnection or short circuit. Conditions of 1 cycle. <table border="1" data-bbox="922 1305 1286 1435"> <thead> <tr> <th>Step</th> <th>Temperature ($^{\circ}\text{C}$)</th> <th>Times (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>85 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table> Total : 5 cycles Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber | Step | Temperature ($^{\circ}\text{C}$) | Times (min.) | 1 | -25 ± 3 | 30 ± 3 | 2 | Room Temperature | Within 3 | 3 | 85 ± 3 | 30 ± 3 | 4 | Room Temperature |
| Step | Temperature ($^{\circ}\text{C}$) | Times (min.) | | | | | | | | | | | | | | |
| 1 | -25 ± 3 | 30 ± 3 | | | | | | | | | | | | | | |
| 2 | Room Temperature | Within 3 | | | | | | | | | | | | | | |
| 3 | 85 ± 3 | 30 ± 3 | | | | | | | | | | | | | | |
| 4 | Room Temperature | Within 3 | | | | | | | | | | | | | | |
| Humidity Resistance | 1. Appearance : No damage 2. Inductance : Within $\pm 5\%$ of initial value. No disconnection or short circuit. | Temperature : $40\pm 5^{\circ}\text{C}$ Humidity : 90% to 95% Applied Current : Rated Current Time : 500 ± 12 hours Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber | | | | | | | | | | | | | | |



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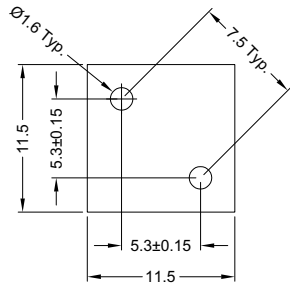
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10. SOLDERIND AND MOUNTING :

10-1. Recommended PC Board Pattern



10-2. 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.

10-2.1 Solder Re-flow :

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

10-2.2 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.

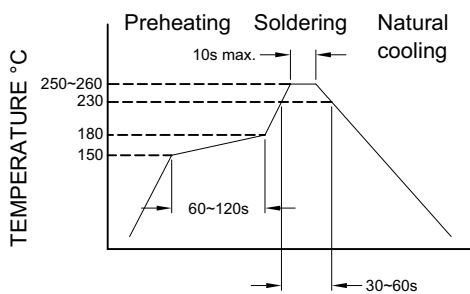


Figure 1. Re-flow Soldering

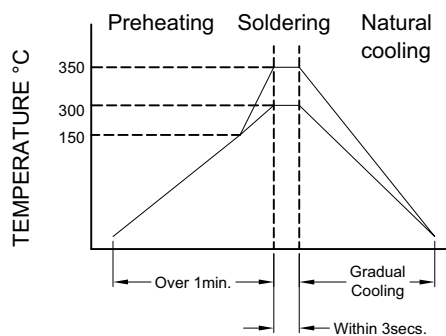


Figure 2. Iron Soldering



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11. PACKING AND QUANTITY :

| | |
|-----------|---------|
| Size | SDM109N |
| Styrofoam | 100 |
| Inner Box | 1000 |
| Carton | 2000 |

Application Notice

1. Storage Conditions :

To maintain the solderability of terminal electrodes :

- a) Temperature and humidity conditions : Less than 30°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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