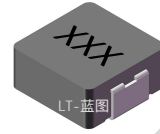


SMS1770 Series Ultra-high current SMD power inductors



◆特征:

- 低直流电阻和超大电流的薄型设计
- 磁屏蔽型抗电磁干扰强适用于高密度安装
- 高可靠性, 通过采用一体成型结构享有卓越的抗震动性
- 由于复合结构, 超低蜂鸣噪声
- 低损耗合金粉末压铸低阻抗, 小寄生电容
- 能效高, 可减少绕线的低直流电阻与磁芯的涡流损耗
- 频率高达 3MHz
- 绝缘最大电压 30VDC
- 符合 RoHS, 无卤和 REACH

Features:

- Low RDC and ultra-high current thin design
- Magnetic shielding type, strong anti- electromagnetic Interference, suitable for high- density installation
- High-reliability, High vibration resistance as result of newly developed integral construction
- Ultra Low buzz noise, due to composite construction
- Die-casting by low loss alloy powder low impedance, Small parasitic capacitance
- High efficiency Low DC resistance of winding and low eddy-current loss of the core
- Frequency up to 3MHz
- Absolute maximum voltage 30VDC
- RoHS, Halogen Free and REACH Compliance

◆用途:

- PDA, 笔记本, 台式机, 服务器应用程序
- 大电流 POL 转换器
- 电池供电设备
- 分布式电源系统中的 DC/DC 转换器

Applications:

- PDA , notebook ,desktop ,server applications
- High current POL converters
- Battery powered devices
- DC/DC converters in distributed power systems

◆环境:

- 工作温度: -55℃至+125℃  
(包括线圈自身温升)

Environmental Data:

- Operating Temperature: -55℃ to +125℃  
(Including coils self-temperature rise)

◆试验设备:


- 电感值: WK3260B 或同等仪器
- 电流: WK3260B+WK3265B 或同等仪器
- 直流电阻: Chroma 16502 或同等仪器

Test Equipment:

- L: WK3260B LCR meter or equivalent
- Isat & Irms: WK3260B+WK3265B or equivalent
- DCR: Chroma 16502 or equivalent

◆产品型号:

Product Identification:

|   |  |                 |               |               |
|---|--|-----------------|---------------|---------------|
| <b>SMS</b><br>①   | <b>1770</b><br>②                                     | <b>100</b><br>③ | <b>M</b><br>④ | <b>I</b><br>⑤ |
| ①   | ②  | ③               |               |               |
| 类型 Type   | 外形尺寸(L×W×H) (mm)<br>External Dimensions (L×W×H) (mm) |                 | Inductance    |               |
| SMS<br>成型贴片功率电感<br>Molding SMD Power Inductor  | 1770   | 17.50×17.15×7.5 | 10 uH         |               |

④

⑤

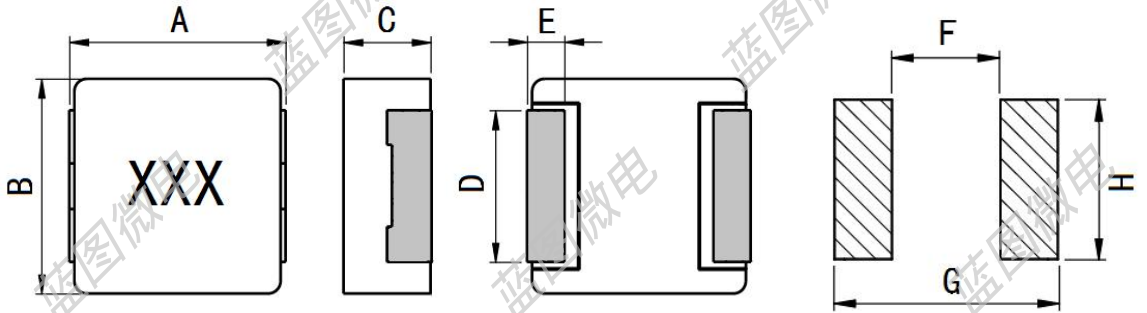
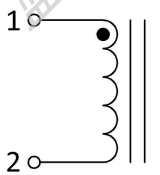
|                          |
|--------------------------|
| 公差 Inductance Tolerance  |
| J:±5%,K: ±10%, L: ±15%   |
| M: ±20%,P: ±25%, N: ±30% |

|            |                |
|------------|----------------|
| 包装 Packing |                |
| B          | 散装Bulk Package |
| TF         | 编带Tape & Reel  |

◆外观尺寸:

Shape and Dimensions(dimensions are in mm):

SCHMATIC



Recommended Land Pattern

| Part No | ITEM      |            |          |          |          |      |      |      |
|---------|-----------|------------|----------|----------|----------|------|------|------|
|         | A         | B          | C        | D        | E        | F    | G    | H    |
| SMS1770 | 17.5±0.50 | 17.15±0.30 | 7.50 Max | 12.0 Typ | 2.50 Typ | 12.4 | 19.5 | 12.5 |

◆规格特性:

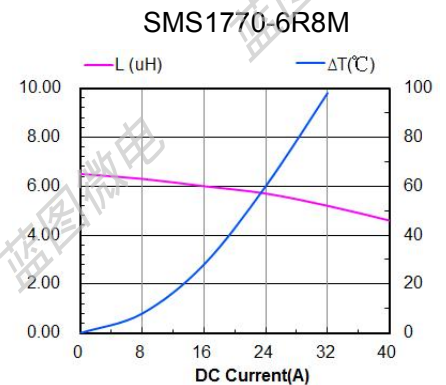
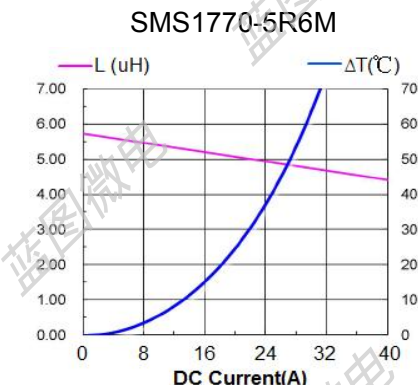
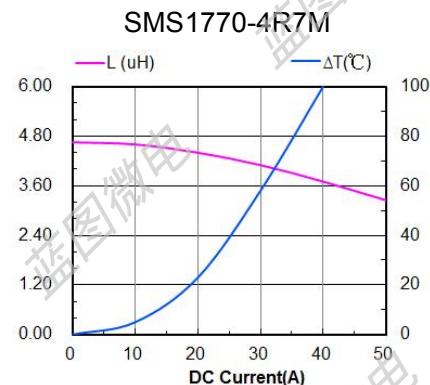
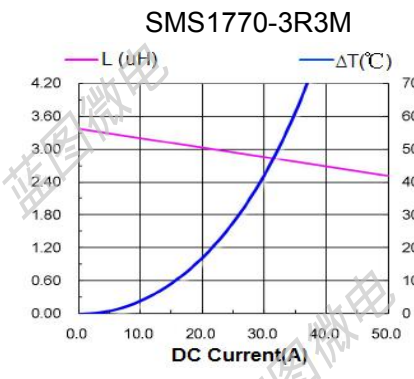
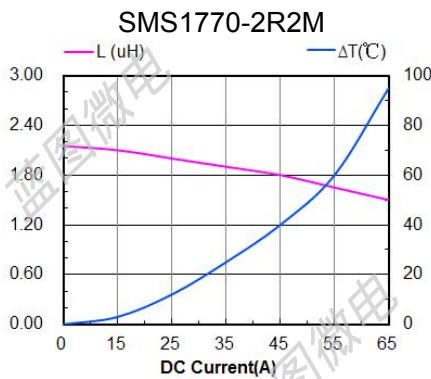
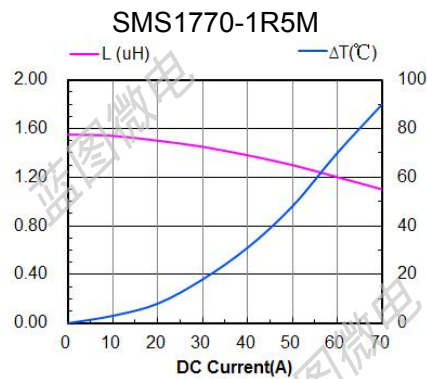
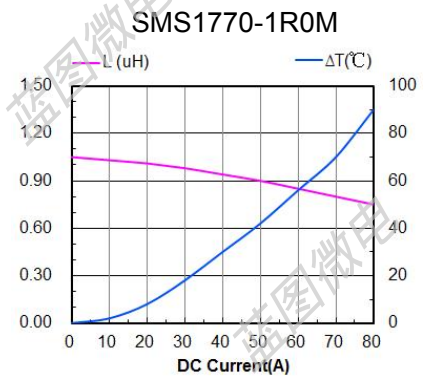
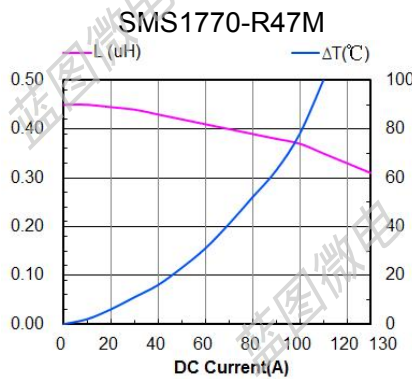
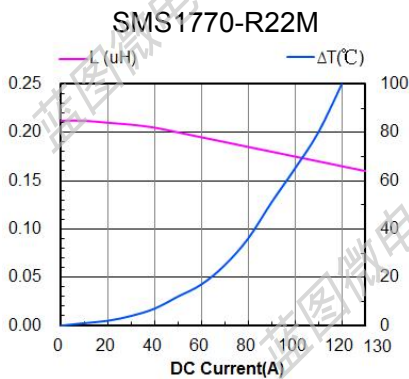
Specifications:

● SMS1770 Series Electrical Characteristics (Electrical specifications at 25°C)

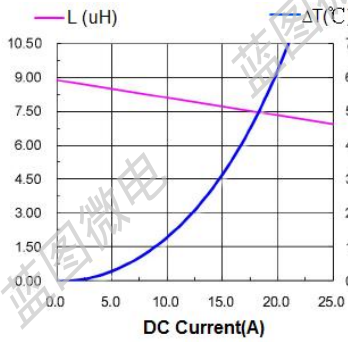
| Part No      | Inductance<br>100KHz 1.0V |      | DCR (mΩ) |       | Saturation<br>Current (A) | Heat Rating<br>Current |
|--------------|---------------------------|------|----------|-------|---------------------------|------------------------|
|              | L(μH)<br>@0A              | Tol  | Typical  | Max   | Typical                   | Typical                |
| SMS1770-R22M | 0.22                      | ±20% | 0.63     | 0.75  | 75.00                     | 57.00                  |
| SMS1770-R47M | 0.47                      | ±20% | 0.90     | 1.03  | 72.00                     | 55.00                  |
| SMS1770-1R0M | 1.0                       | ±20% | 1.60     | 2.30  | 55.00                     | 32.00                  |
| SMS1770-1R5M | 1.5                       | ±20% | 1.78     | 2.50  | 48.00                     | 31.00                  |
| SMS1770-2R2M | 2.2                       | ±20% | 2.40     | 2.70  | 34.00                     | 29.00                  |
| SMS1770-3R3M | 3.3                       | ±20% | 3.68     | 4.20  | 30.00                     | 24.00                  |
| SMS1770-4R7M | 4.7                       | ±20% | 4.84     | 5.50  | 24.00                     | 21.00                  |
| SMS1770-5R6M | 5.6                       | ±20% | 6.68     | 7.60  | 23.00                     | 20.00                  |
| SMS1770-6R8M | 6.8                       | ±20% | 8.40     | 9.20  | 22.00                     | 17.00                  |
| SMS1770-8R2M | 8.2                       | ±20% | 10.10    | 11.60 | 20.00                     | 13.00                  |
| SMS1770-100M | 10                        | ±20% | 11.60    | 13.00 | 19.00                     | 12.00                  |
| SMS1770-150M | 15                        | ±20% | 18.80    | 20.50 | 14.50                     | 11.00                  |
| SMS1770-220M | 22                        | ±20% | 25.10    | 26.50 | 11.50                     | 8.50                   |
| SMS1770-330M | 33                        | ±20% | 38.00    | 44.00 | 10.00                     | 8.00                   |

| Part No      | Inductance<br>100KHz 1.0V |      | DCR (mΩ) |        | Saturation<br>Current (A) | Heat Rating<br>Current |
|--------------|---------------------------|------|----------|--------|---------------------------|------------------------|
|              | L(μH)<br>'@0A             | Tol  | Typical  | Max    | Typical                   | Typical                |
| SMS1770-470M | 47                        | ±20% | 48.00    | 55.00  | 7.50                      | 6.00                   |
| SMS1770-560M | 56                        | ±20% | 54.00    | 62.00  | 7.00                      | 5.50                   |
| SMS1770-680M | 68                        | ±20% | 68.00    | 80.00  | 6.50                      | 5.20                   |
| SMS1770-101M | 100                       | ±20% | 110.00   | 118.00 | 5.00                      | 3.70                   |

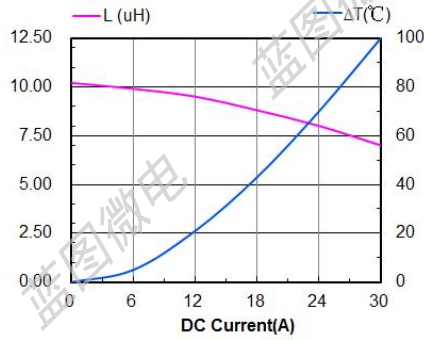
- Saturation Current: DC current at which inductance drops 30% from its value without current.
- Heat Rating Current: the actual value of DC current when the temperature rise is  $\Delta T$  40°C ( $T_a=25^\circ\text{C}$ ).
- Rated DC Current: The less value which is Isat or Irms.
- Special remind: Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
- Saturation current VS temperature rise current curve



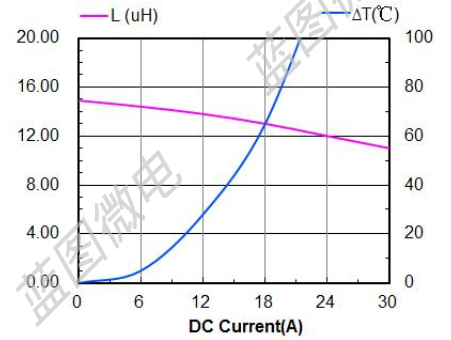
SMS1770-8R2M



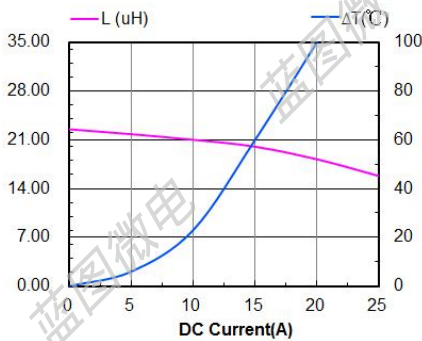
SMS1770-100M



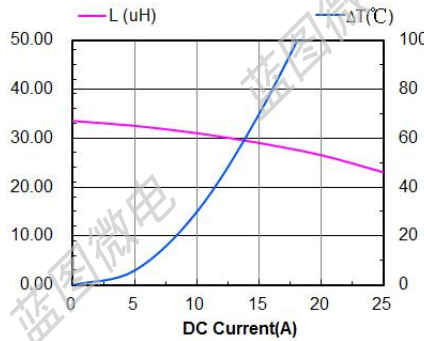
SMS1770-150M



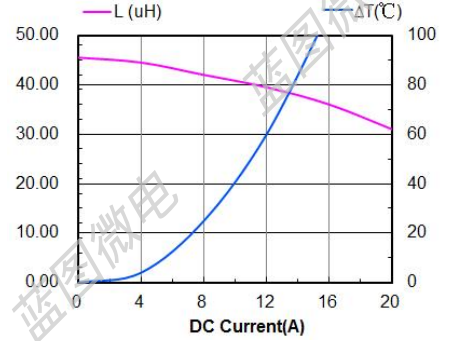
SMS1770-220M



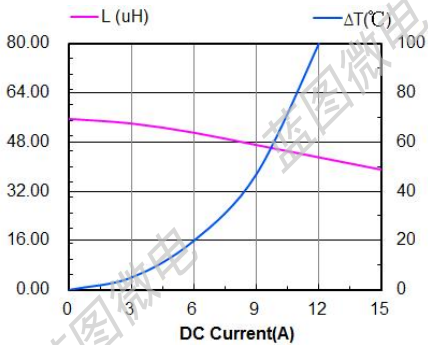
SMS1770-330M



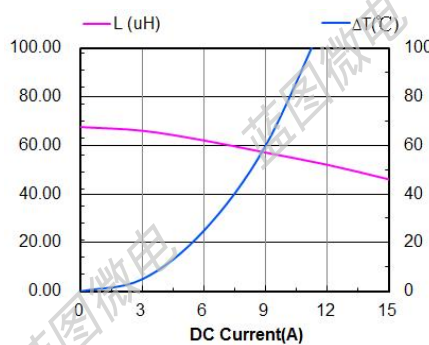
SMS1770-470M



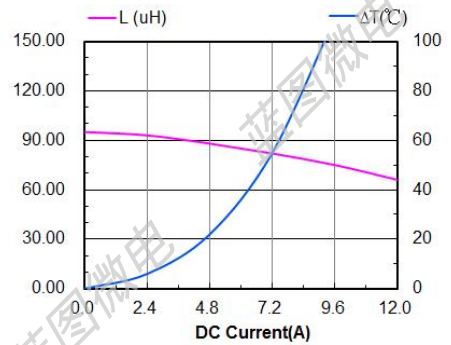
SMS1770-560M



SMS1770-680M



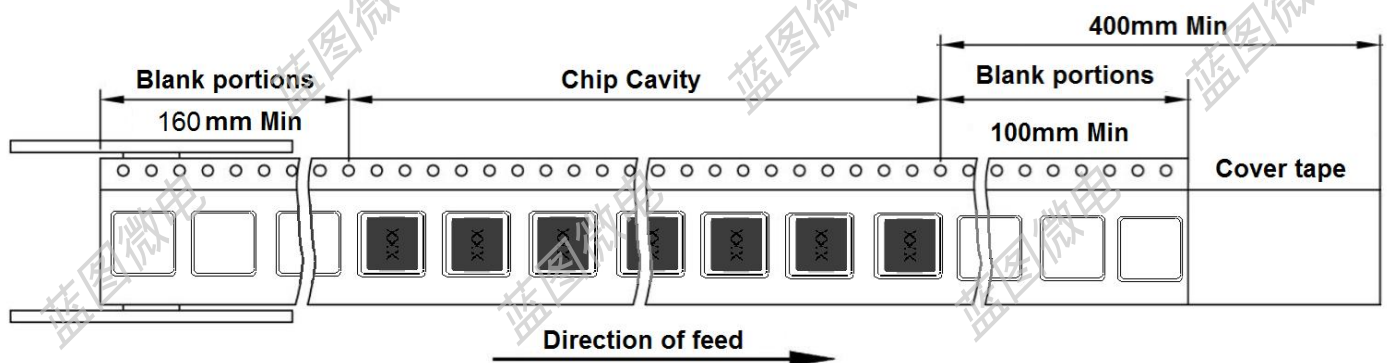
SMS1770-101M



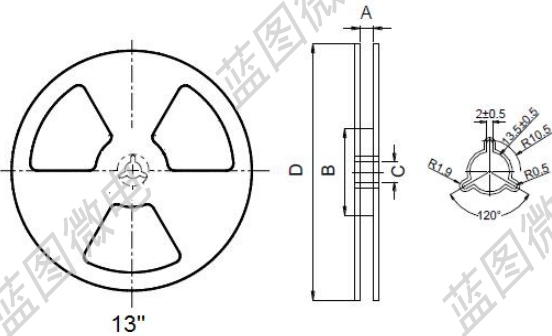
◆ 产品包装:

Packaging:

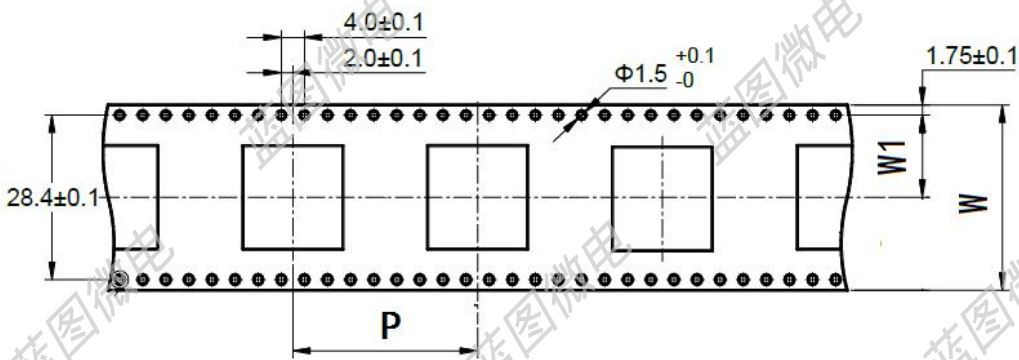
- Tape and Reel Specifications: (Dimensions are in mm)



## ● Reel dimensions (mm)

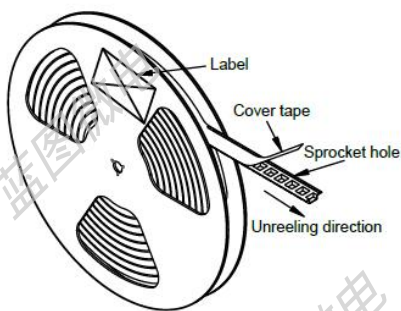


## ● Tape Dimension (mm)

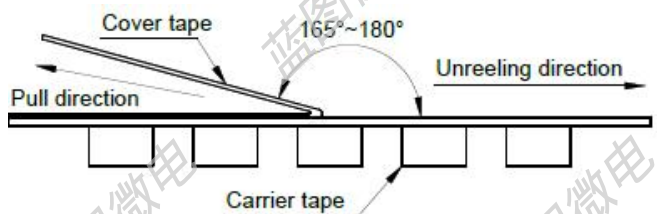


| Part No. | Tape Dimension |      |      | Reel Dimensions |     |    |     | REEL (PCS) | Inside Box(PCS) | Outside Carton(PCS) |
|----------|----------------|------|------|-----------------|-----|----|-----|------------|-----------------|---------------------|
|          | W              | P    | W1   | A               | B   | C  | D   |            |                 |                     |
| SMS1770  | 32.0           | 24.0 | 14.2 | 32.4            | 100 | 13 | 330 | 300        | 600             | 2400                |

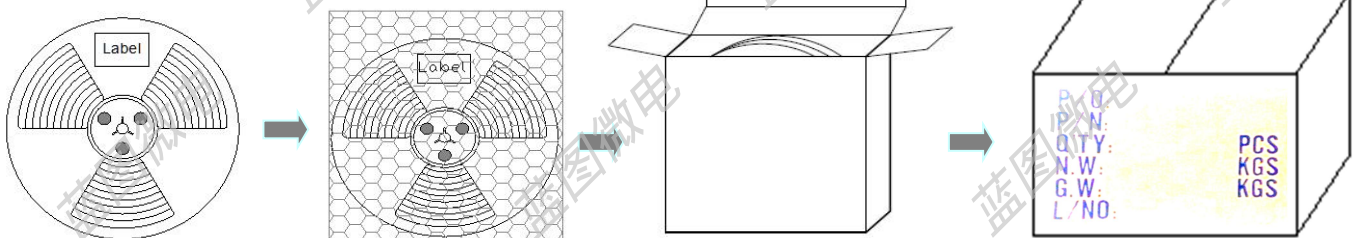
## ● Cover tape peel off condition



- a) Cover tape peel force shall be 10 to 120g
- b) Noodle strip peeling angle 165° to 180°



## ● Packing quantity



REEL 13

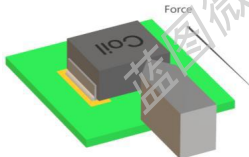

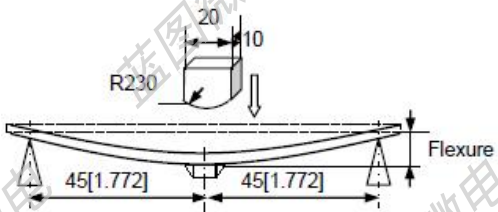
PE 袋

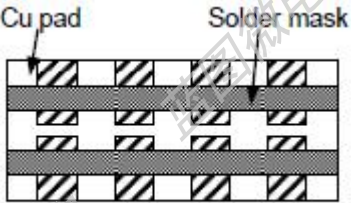
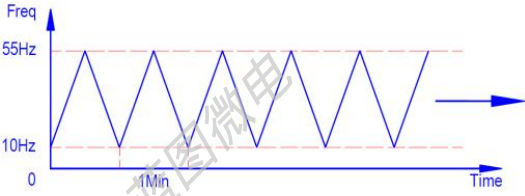
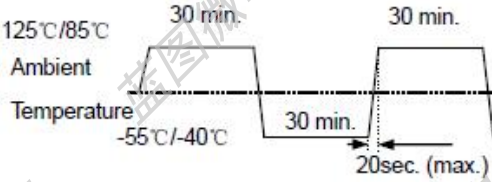
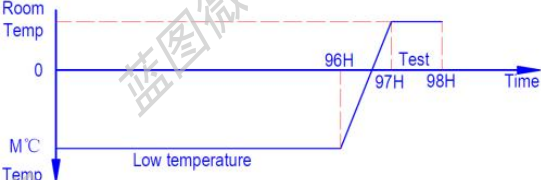
Inside Box

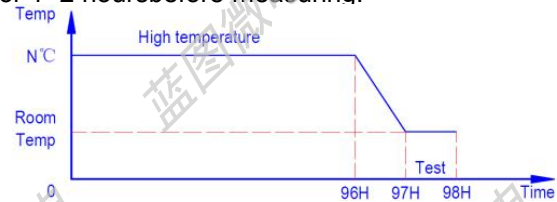
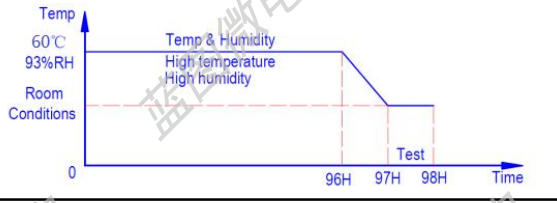
Outside Carton,  
不足整箱用内盒或填充物装满

◆可靠性测试:

Reliability Testing:

| Items  | Requirements   | Test Methods and Remarks   |
|--|--|--|
| Terminal Strength<br>Reference documents: GB/T 2423.60-2008<br>端子强度(SMT) | <p>1. Pulling test:<br/>Define: A: sectional area of terminal<br/><math>A \geq 8\text{mm}^2</math> force <math>\geq 5\text{N}</math> time: 30sec<br/><math>8\text{mm}^2 &lt; A \leq 20\text{mm}^2</math> force <math>\geq 10\text{N}</math> time: 10sec<br/><math>20\text{mm}^2 &lt; A</math> force <math>\geq 20\text{N}</math> time: 10sec</p> <p>2. Solder paste thickness: 0.12mm</p> <p>3. Meet the above requirements without any loose terminal</p>                             | <p>Solder the inductor to the testing jig using leadfree solder. Then apply a force in the</p> <p>Keep time: <math>10 \pm 1\text{s}</math> Speed: 1.0mm/s.</p>   |
| Terminal Strength<br>Reference documents: GB/T 2423.60-2008<br>端子强度(DIP) | <p>1. Terminal diameter(d) mm <math>0.35 &lt; d \leq 0.50</math> Applied force: 5N Duration: 10sec</p> <p>2. Terminal diameter(d) mm <math>0.50 &lt; d \leq 0.80</math> Applied force: 10N Duration: 10sec</p> <p>3. Terminal diameter(d) mm <math>0.80 &lt; d \leq 1.25</math> Applied force: 20N Duration: 10sec</p> <p>4. Terminal diameter(d) mm <math>D &gt; 1.25</math> Applied force: 40N Duration: 10sec</p> <p>5. Meet the above requirements without any loose terminal.</p> | <p>Pull Force: the force shall be applied gradually to the terminal and then maintained for 10 seconds.</p>   |
| Resistance to Flexure<br>JIS C 5321:1997<br>抗弯曲性试验                       | <p>1. No visible mechanical damage.</p>  | <p>1. Solder the inductor to the test jig (glass epoxy board)</p> <p>2. shown in Using a leadfree solder. Then apply a force in the direction shown</p> <p>3. Flexure: 2mm.</p> <p>4. Pressurizing Speed: 0.5mm/sec.</p> <p>5. Keep time: 30 sec.</p>  |
| Dropping<br>Reference documents: GB/T 2423.7-2018<br>落下试验                | <p>1. No case deformation or change in appearance.</p> <p>2. No short and no open.</p>   | <p>1. Drop the packaged products from 1m high in 1 angle, 3 ridges and 6 surfaces, twice in each direction.</p>  |
| Solderability<br>Reference documents: GB/T 2423.28-2005<br>可焊性试验         | <p>1. No visible mechanical damage.</p> <p>2. Wetting shall exceed 75% coverage for</p> <p>3. Terminals must have 95% minimum solder coverage</p>  | <p>1. Solder temperature: <math>240 \pm 2^\circ\text{C}</math></p> <p>2. Duration: 3 sec.</p> <p>3. Solder: Sn/3.0Ag/0.5Cu.</p> <p>4. Flux: 25% Resin and 75% ethanol in weight</p>  |

| Items  | Requirements   | Test Methods and Remarks   |
|--|--|--|
| <p>Vibration</p> <p>Reference documents:<br/>GB/T 2423.10-2019</p> <p>振動試驗</p>                                 | <p>1.No visible mechanical damage.</p> <p>2. Inductance change: Within <math>\pm 10\%</math>.</p> <p>3.Q factor change: Within <math>\pm 20\%</math>.</p>  <p style="text-align: center;">Glass Epoxy Board</p> | <p>1.Solder the inductor to the testing jig (glass epoxy board shown in ) using leadfree solder.</p> <p>2.The inductor shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz.</p> <p>3.The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).</p>  |
| <p>Thermal Shock</p> <p>Reference documents:<br/>GB/T 2423.22-2012</p> <p>Method Na</p> <p>冷热冲击试验</p>          | <p>1.No visible mechanical damage.</p> <p>2. Inductance change: Within <math>\pm 10\%</math>. (Mn-Zn: Within <math>\cong 30\%</math> )</p> <p>3.Q factor change: Within <math>\pm 20\%</math>.</p>   | <p>1.Start at ( 85~125℃ ) for T time, rush to (-55~-40℃ ) for T time as one cycle, go through 100 cycles.</p> <p>2.Transforming interval: Max. 20 sec.</p> <p>3.Tested cycle: 100 cycles.</p> <p>4.The chip shall be stabilized at normal condition for 1~2 hours</p>    |
| <p>Low temperature Storage</p> <p>Reference documents:<br/>GB/T 2423.1-2008</p> <p>Method Ab</p> <p>低温储存试验</p> | <p>1.No visible mechanical damage.</p> <p>2. Inductance change: Within <math>\pm 10\%</math>. (Mn-Zn: Within <math>\cong 30\%</math> )</p> <p>3.Q factor change: Within <math>\pm 20\%</math>.</p>   | <p>1.Temperature: M(-55~-40<math>\pm 2</math>℃)</p> <p>2.Duration: 96<math>\pm 2</math> hours</p> <p>3.The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>    |

| Items  | Requirements  | Test Methods and Remarks   |
|--|---|--|
| High temperature Storage<br>Reference documents: GB/T 2423.2-2008<br>Method Bb<br>高温储存试验 | 1.No visible mechanical damage.<br>2. Inductance change: Within $\pm 10\%$ .(Mn-Zn: Within $\leq 30\%$ )<br>3.Q factor change: Within $\pm 20\%$ .                                    | 1.Temperature:N( $125\sim 85\pm 2^{\circ}\text{C}$ ).<br>2.Duration: 96 $\pm 2$ hours<br>3.The chip shall be stabilized at normal condition for 1~2 hours before measuring.<br>                    |
| Damp Heat (Steady States)<br>Reference documents: GB/T 2423.3-2016<br>恒定湿热试验             | 1.No visible mechanical damage.<br>2. Inductance change: Within $\pm 10\%$ .(Mn-Zn: Within $\leq 30\%$ )<br>3.Q factor change: Within $\pm 20\%$ .                                    | 1.Temperature: $60\pm 2^{\circ}\text{C}$<br>2.Humidity: 90% to 95% RH.<br>3.Duration: 96 $\pm 2$ hours.<br>4.The chip shall be stabilized at normal condition for 1~2 hours before measuring.<br> |
| Heat endurance of Reflow soldering<br>Reference documents: GJB 360B-2009<br>回流焊耐热性试验     | 1.No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$ (Mn-Zn: $\Delta L/L \leq 30\%$ )<br>3. $\Delta Q/Q \leq 30\%$ (SMD series only)<br>4. $\Delta DCR/DCR \leq 10\%$ | 1.Refer to the above reflow curve and go through the reflow for twice.<br>2.The peak temperature : $260\pm 0/-5^{\circ}\text{C}$   |
| Resistance to solvent test<br>Reference documents: IEC 68-2-45:1993<br>耐溶剂性试验            | No case deformation or change in appearance or obliteration of marking  | To dip parts into IPA solvent for $5\pm 0.5$ Min,then drying them at room temp for 5Min,at last ,to brushing making 10 times.  |
| Overload test<br>Reference documents: JIS C5311-6.13<br>过负荷试验                            | 1.During the test no smoke, no peculiar, smell, no fire<br>2.The characteristic is normal after test  | Apply twice as rated current for 5 minutes.  |
| voltage resistance test<br>Reference documents: MIL-STD-202G Method 301<br>绝缘耐压测试        | 1.During the test no breakdown<br>2.The characteristic is normal after test   | 1. For parts with two coils<br>2. DC1000V, Current: 1mA, Time: 1Min.<br>3. Refer to catalogue of specific products   |





使用注意事项

REMINDERS FOR USING THESE PRODUCTS



- 保存时间为12个月以内，保存条件（温度5~40°C以下、湿度35 ~ 66%RH 以下），需充分注意。若超过保存时间，端子电极的可焊性将可能老化。

The storage period is within 12 months. Be sure to follow the storage conditions (temperature: 5~40°C, humidity: 35 to 65% RH or less). If the storage period elapses, the soldering of the terminal electrodes may deteriorate.

- 请勿在气体腐蚀环境（盐、酸、碱等）下使用和保存。

Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).

- 手上的油脂会导致可焊性降低，应避免用手直接接触端子。

Don't touch electrodes directly with bare hands as oil secretions may inhibit soldering. Always ensure optimum conditions for soldering.

- 请小心轻拿轻放，避免由于产品的跌落或取出不当而导致的损坏。

Please always handle products carefully to prevent any damage caused by dropping down or inappropriate removing.

- 端子过度弯曲会导致断线，请不要过度弯曲端子。

Don't bend the terminals with excessive stress in case of any wire fracture.

- 不要清洗产品，如需要清洗时请联系我司。

Don't rinse coils by yourself and please contact SXN if necessary.

- 请勿将本产品靠近磁铁或带有磁力的物体

Don't expose the products to magnets or magnetic fields

- 在实施焊接前，请务必进行预热。预热温度与焊接温度及芯片温度的温度差要在150°C 以内。

Before soldering, be sure to preheat components. The preheating temperature should be set so that the temperature difference between the solder temperature and chip temperature does not exceed 150°C.

- 安装后的焊接修正应在规格书规定的条件范围内。若加热过度可能导致短路、性能降低、寿命减少。

Soldering corrections after mounting should be within the range of the conditions determined in the specifications. If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.

- 装置会因通电而自我发热（温度上升），因此在热设计方面需留有充分余地。

Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.

- 非磁屏蔽型在基板设计时需注意配置线圈，受到电磁干扰可能会导致误动作。

Carefully lay out the coil for the circuit board design of the non-magnetic shield type. A malfunction may occur due to magnetic interference.

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