# MOLDING POWER INDUCTORS

## 1. Features

- High rated current
- Frequency up to 3 MHz
- 125℃ maximum total temperature operation
- Low core loss
- Ultra low buzz noise due to molding construction
- Halogen Free & ROHS compliant

## 2. Applications

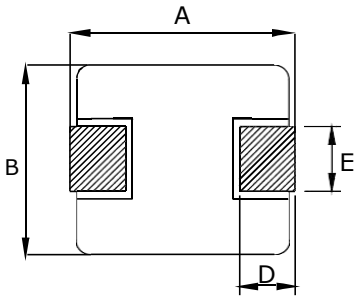
- Laptops and PCs
- Switch and servers
- Base stations
- DC/DC converters
- Battery powered devices
- SSD modules

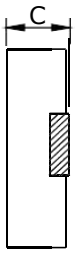
## 3. Product Identification

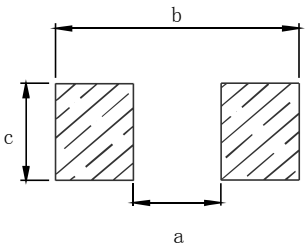
| XR | XXXX | --- | XXX | M |
|---|---|---|---|---|
| ① | ② | | ③ | ④ |

① Series name
② Dimensions and shape（0412~1265）
③ Inductance Value
④ Inductance Tolerance ( M= ± 20% )

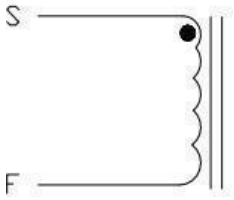
## 4. Dimensions (unit:mm)




Recommend Land Pattern



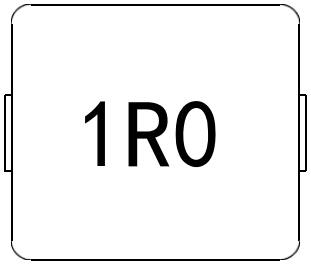

SCHEMATIC DRAWING

| series | A | B | C | D | E | a typ | b typ | c typ |
|---|---|---|---|---|---|---|---|---|
| XR0650 | 7.0±0.3 | 6.6±0.2 | 4.8±0.2 | 1.6±0.3 | 3.0±0.3 | 3.7 | 8.4 | 3.5 |

## 5. Marking

The inductor is marked with a 3-digit code

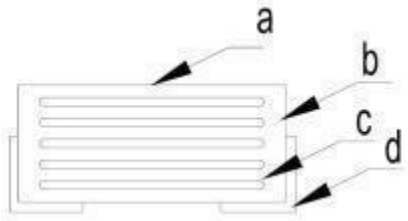
| Nominal Inductance | |
|---|---|
| Example | Nominal Value |
| 1R0 | 1.0 μH |
| 100 | 10 μH |
| 101 | 100 μH |




Note：Using Ink for marking

## 6. Structure and Components

| Symbol | Components | Material |
|---|---|---|
| a | MARKING | Ink(black) |
| b | CORE | Alloy Sponge Powder |
| c | WIRE | Polyurethane copper wire |
| d | Terminal | Copper plated with Sn |



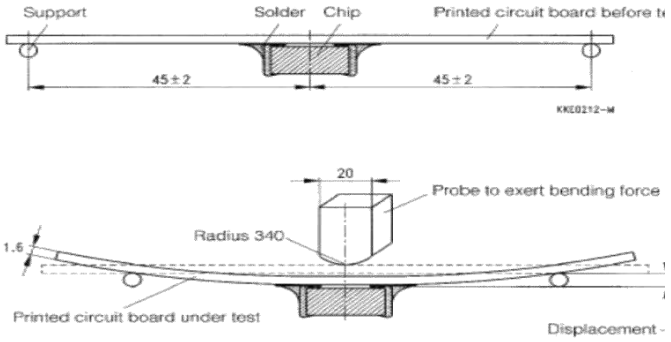
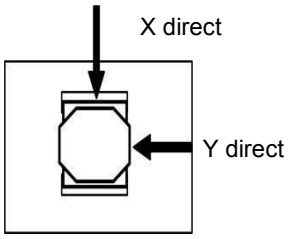
## 7. Electrical characteristics

**•XR0650 TYPE：**

| Part No. | Inductance | DC Resistance | Saturation Current | Heating Rating Current |
|---|---|---|---|---|
| | L0 (μH) | DCR (m ) | Isat (A) | Irms (A) |
| | ±20 %, 100 kHz, 1V | MAX. | TYP. | TYP. |
| XR0650-R47M | 0.47 | 3.9 | 21.0 | 20 |
| XR0650-R68M | 0.68 | 4.5 | 18.0 | 16.5 |
| XR0650-1R0M | 1.0 | 6.6 | 16.0 | 12 |
| XR0650-1R5M | 1.5 | 10 | 13.0 | 9.5 |
| XR0650-2R2M | 2.2 | 12.5 | 11.0 | 9 |
| XR0650-3R3M | 3.3 | 22.0 | 10.0 | 8.5 |
| XR0650-4R7M | 4.7 | 29 | 8 | 6 |
| XR0650-5R6M | 5.6 | 35 | 6.8 | 6 |
| XR0650-6R8M | 6.8 | 41 | 6.3 | 5.8 |
| XR0650-8R2M | 8.2 | 48 | 5.5 | 5.5 |
| XR0650-100M | 10 | 60 | 5.3 | 4.5 |
| XR0650-150M | 15 | 90 | 4.0 | 3.1 |
| XR0650-220M | 22 | 140 | 3.5 | 2.6 |
| XR0650-330M | 33 | 190 | 3.0 | 2.3 |
| XR0650-470M | 47 | 230 | 2.6 | 2.0 |
| XR0650-680M | 68 | 360 | 2.2 | 1.7 |
| XR0650-820M | 82 | 480 | 2.1 | 1.6 |
| XR0650-101M | 100 | 595 | 2.0 | 1.5 |

**8. Reliability Test**

<table>
<tr><th>Item</th><th>Specification and Requirement</th><th>Test Method</th></tr>
<tr><td>Solderability</td><td>1. No case deformation<br>or change inapperarance<br><br>2. New soldercoverage<br>More than 90%</td><td>1.Preheat：155℃±5℃ ，60S±2S<br>2.Tin: lead-free.<br>3.Temperature:245℃±5℃，flux 3.0S±0.5S.</td></tr>
<tr><td>Mechanical shock</td><td>1. No case deformation<br>or change inapperarance<br><br>2. △L/Lo≦±10%</td><td>1. Acceleration： 100G<br>2. Pulse time:：6ms<br>3. 3 times in each positive and negative direction of 3 mutual perpendicular directions</td></tr>
<tr><td>Mechanical vibration</td><td>1. No case deformation<br>or change inapperarance<br><br>2. △L/Lo≦±10%</td><td>1. The test samples shall be soldered to the board. Then it shall be submitted to below test conditions.<br><table><tr><td>Fre. Range</td><td>10~55Hz</td></tr><tr><td>Total Amplitude</td><td>1.5mm</td></tr><tr><td>Sweeping Method</td><td>10Hz to 55Hz to 10Hz</td></tr><tr><td>Time</td><td>For 2 hours on each X,Y,Z axis.</td></tr></table>2. Recovery: At least 2 hours of recovery underthe standard condition after the test, followed by the measurement within 24 ±2 hours.</td></tr>
<tr><td>Thermal Shock</td><td>Inductance change:<br>Within ± 10% Without distinct damage in appearance</td><td>1. First -55℃ for 30 minutes，last 125℃ for 30 minutes as 1 cycle. Go through 1000 cycles.<br>2. Max transfer time is 2 minutes.<br>3. Measured at room temperature after placing for24±2 hours</td></tr>
<tr><td>Humidity Resistance</td><td>Inductance change:<br>Within ± 10% Without distinct damage in appearance</td><td>1.Reflow 2 times,<br>2.85℃,85%RH,1000 hours<br>3.Measured at room temperature after placing for 24±2 hours</td></tr>
<tr><td>Low temperature storage</td><td>Inductance change:<br>Within ± 10% Without distinct damage in appearance</td><td>1. Temperature：-55 ± 2℃<br>2. Time：1000 hours<br>3. Measured at room temperature after placing for24±2 hours</td></tr>
</table>

| | | |
|---|---|---|
| High temperature storage | Inductance change:<br>Within ± 10% Without distinct damage in appearance | 1. Temperature：+125 ± 2℃<br>2. Time：1000 hours<br>3. Measured at room temperature after placing for 24±2 hours |
| Board Flex | Inductance change:<br>Within ± 10% Without distinct damage in appearance | 1、Run through IR reflow for 2 times；<br>2、Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down<br>3 、 The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum.<br>4、The duration of the applied forces shall be 60±5 sec. The force is to be applied only once to the board.<br>  |
| Terminal Strength | No removal or split of the termination or other defects shall occur. | 1、The test samples shall be soldered to the board<br>2、Push the product vertically from the side of the sample using the thrust tester.<br>3、Automotive electronics：17.7N，60S±1s，X，Ydirect.<br>  |

## Recommended Soldering Technologies

### (1) Re-flowing Profile

Preheat condition: 150 ~200℃/60~180sec.

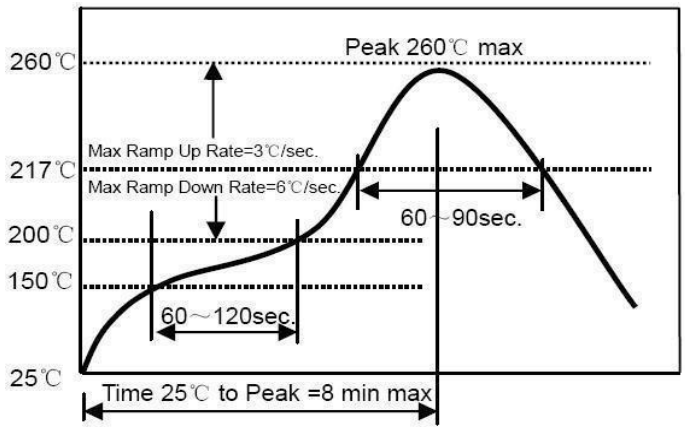
Allowed time above 217℃: 80~120sec.

Max temp: 260℃

Max time at max temp: 10 sec.

Solder paste: Sn/3.0Ag/0.5Cu

Allowed Reflow time: 2x max




### (2) Iron Soldering Profile

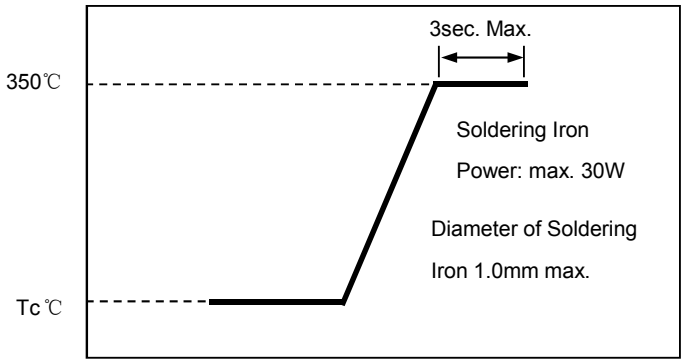
Iron soldering power: Max. 30W

Pre-heating: 150℃/60sec.

Soldering time: 3sec.Max.

Solder paste: Sn/3.0Ag/0.5Cu

Max.1 times for iron soldering

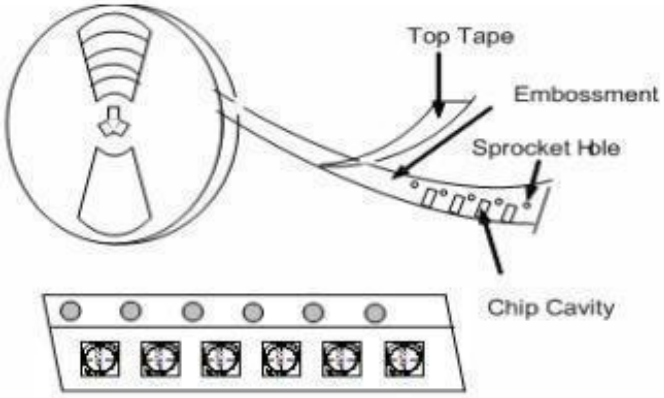


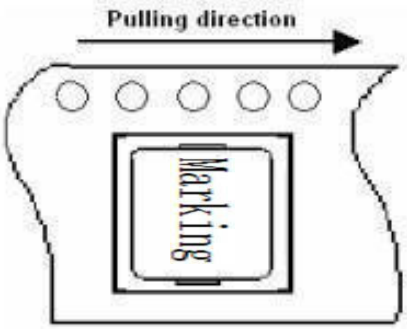
## 9. Packaging, Storage and Transportation

- Tape Carrier Packaging:

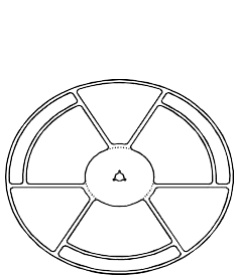
| Type | Standard Quantity (pcs/reel) | Type | Standard Quantity (pcs/reel) |
|---|---|---|---|
| XR0412 | **2000/3000** | XR0640 | **1000** |
| XR0420 | **3000** | XR0650 | **1000** |
| XR0518 | **2000/2500** | XR1040 | **500/1000** |
| XR0520 | **2000/2500** | XR1045 | **800** |
| XR0530 | **1500/2000** | XR1240 | **500** |
| XR0620 | **1000/1500** | XR1250 | **500** |
| XR0624 | **1000/1500** | XR1265 | **400/500** |
| XR0630 | **1000** | | |

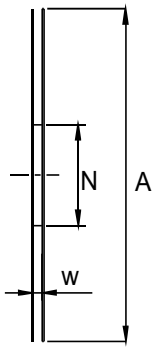
- Taping Drawings (UNIT:mm)

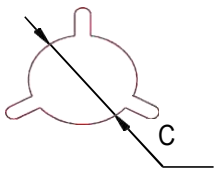


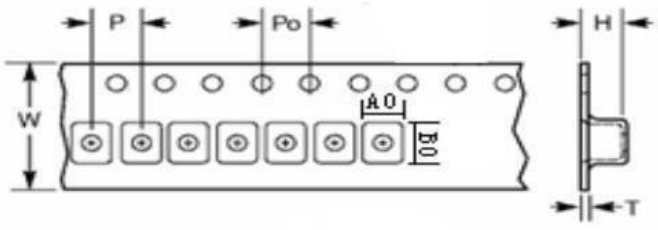




- Reel and Taping Dimensions (UNIT:mm)





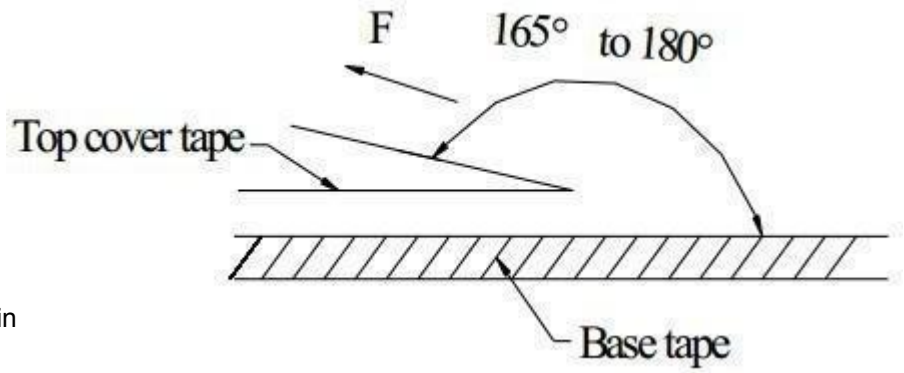



| Type | Reel Dimensions（mm） | | | | Tape Dimensions（mm） | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | N | W | C | W | P | P0 | A0 | B0 | H | T |
| XR0412 | 330 +2/-0 | 100 +2/-0 | 12.4 +2/-0 | 13.2 ±0.2 | 12±0.3 | 8±0.1 | 4±0.1 | 4.4±0.1 | 4.9±0.1 | 1.5±0.05 | 0.3±0.05 |
| XR0420 | 330 +2/-0 | 100 +2/-0 | 12.4 +2/-0 | 13.2 ±0.2 | 12±0.3 | 8±0.1 | 4±0.1 | 4.4±0.1 | 4.9±0.1 | 2.3±0.05 | 0.35±0.05 |
| XR0518 | 330 +2/-0 | 100 +2/-0 | 12.4 +2/-0 | 13.2 ±0.2 | 12±0.3 | 8±0.1 | 4±0.1 | 5.4±0.1 | 5.9±0.1 | 2.1±0.05 | 0.35±0.05 |
| XR0520 | 330 +2/-0 | 100 +2/-0 | 12.4 +2/-0 | 13.2 ±0.2 | 12±0.3 | 8±0.1 | 4±0.1 | 5.5±0.1 | 5.85±0.1 | 2.2±0.1 | 0.35±0.05 |
| XR0530 | 330 +2/-0 | 100 +2/-0 | 12.4 +2/-0 | 13.2 ±0.2 | 12±0.3 | 8±0.1 | 4±0.1 | 5.4±0.1 | 5.9±0.1 | 3.3±0.05 | 0.35±0.05 |
| XR0620 | 330 +2/-0 | 100 +2/-0 | 16.4 +2/-0 | 13.2 ±0.2 | 16±0.3 | 12±0.1 | 4±0.1 | 6.9±0.1 | 7.5±0.1 | 2.1±0.05 | 0.35±0.05 |
| XR0624 | 330 +2/-0 | 100 +2/-0 | 16.4 +2/-0 | 13.2 ±0.2 | 16±0.3 | 12±0.1 | 4±0.1 | 6.9±0.1 | 7.5±0.1 | 2.7±0.05 | 0.35±0.05 |
| XR0630 | 330 +2/-0 | 100 +2/-0 | 16.4 +2/-0 | 13.2 ±0.2 | 16±0.3 | 12±0.1 | 4±0.1 | 6.9±0.1 | 7.5±0.1 | 3.3±0.05 | 0.35±0.05 |
| XR0640 | 330 +2/-0 | 100 +2/-0 | 16.4 +2/-0 | 13.2 ±0.2 | 16±0.3 | 12±0.1 | 4±0.1 | 6.9±0.1 | 7.5±0.1 | 4.2±0.1 | 0.35±0.05 |
| XR0650 | 330 +2/-0 | 100 +2/-0 | 16.4 +2/-0 | 13.2 ±0.2 | 16±0.3 | 12±0.1 | 4±0.1 | 6.9±0.1 | 7.5±0.1 | 5.2±0.1 | 0.4±0.05 |
| XR1040 | 330 +2/-0 | 100 +2/-0 | 24.4 +2/-0 | 13.2 ±0.2 | 24±0.3 | 16±0.1 | 4±0.1 | 10.4±0.1 | 11.5±0.1 | 4.3±0.1 | 0.35±0.05 |
| XR1045 | 330 +2/-0 | 100 +2/-0 | 24.4 +2/-0 | 13.2 ±0.2 | 24±0.3 | 16±0.1 | 4±0.1 | 10.4±0.1 | 11.5±0.1 | 4.8±0.1 | 0.35±0.05 |
| XR1240 | 330 +2/-0 | 100 +2/-0 | 24.4 +2/-0 | 13.2 ±0.2 | 24±0.3 | 16±0.1 | 4±0.1 | 13.4±0.1 | 14.4±0.1 | 4.3±0.1 | 0.5±0.05 |
| XR1250 | 330 +2/-0 | 100 +2/-0 | 24.4 +2/-0 | 13.2 ±0.2 | 24±0.3 | 16±0.1 | 4±0.1 | 13.2±0.1 | 14.4±0.1 | 5.3±0.1 | 0.5±0.05 |
| XR1265 | 330 +2/-0 | 100 +2/-0 | 24.4 +2/-0 | 13.2 ±0.2 | 24±0.3 | 16±0.1 | 4±0.1 | 13.2±0.1 | 14.4±0.1 | 6.3±0.1 | 0.5±0.05 |

- Peel force of top cover tape

The peel speed shall be about 300mm/minute

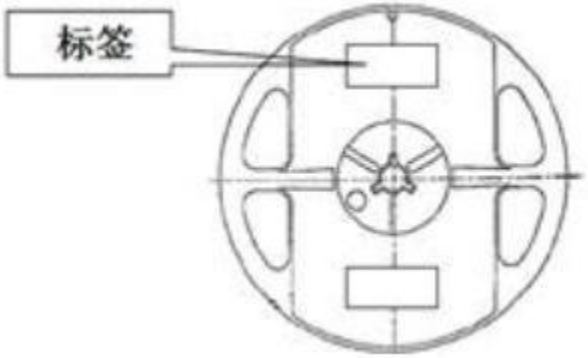
The peel force of top cover tape shall be between 0.1 to 1.3 N




- Label makin

Label on the reel

- Customer's part Number
- Lot Number
- Quantity
- date code




Shipping Label

- Customer's part Number
- Manufacturer's part Number
- Quantity
- date code

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