



# 产品承认书 SPECIFICATION FOR APPROVAL

客户名称:  
CUSTOMER

我司料号: XRTC404012S1R0MBCA  
OUR PART NO.

我司品名: 小型化一体成型电感  
OUR PART NAME

送样日期: 数量: 0PCS  
DATE SAMPLES QUANTITY

| 制造确认 MANUFACTURER APPROVE |            |             |
|---------------------------|------------|-------------|
| 拟制 DRAWN                  | 审核 CHECKED | 确认 APPROVED |
|                           |            |             |

| 客户确认 CUSTOMER APPROVE                                          |               |                     |
|----------------------------------------------------------------|---------------|---------------------|
| 客户名称 CUSTOMER NAME:                                            |               |                     |
| 客户料号 CUSTOMER P/N:                                             |               |                     |
| 规格型号 DESCRIPTION: 尺寸 404012 电感量: 1.0uH                         |               |                     |
| 检查结果: <input type="checkbox"/> 合格 <input type="checkbox"/> 不合格 |               | 签名及盖章:              |
| INSPECT RESULT                                                 | ACCEPT REJECT | SIGNATURE AND STAMP |
| 说明 REMARK:                                                     |               |                     |

如对本承认书内容有异议请提出或标记发送至我司, 本承认书在未收到异议回复时于本承认书提供一周后生效。

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## 1. Scope

### Featur

- 11 Metal material for large current and low loss.
- 12 High performance (Isat) realized by metal dust core.
- 13 Low loss realized with low Rdc.
- 14 Closed magnetic circuit design reduces leakage flux.
- 15 Vinyl thermal spray, better surface compactness.
- 16 Environmental requirements must comply with the QESP-44 document
- 17 100% lead (Pb) free meet RoHS2.0 and Halogen , Reach and other legal and regulatory requirements standard.

### Application

- 2.1 DC/DC converters.
- 2.2 Pad,Smart phone.
- 2.3 Portable gaming devices, Smart wear, Wi-Fi module.
- 2.4 Notebooks, VR, AR.
- 2.5 LCD displays, HDDs, DVCs, DSCs, etc.
- 2.6 Baseband power supply, Amplifier, Power management, Module power supply, Camera power manageme.

## 2. Ordering Procedure

|             |             |           |          |            |          |          |          |          |
|-------------|-------------|-----------|----------|------------|----------|----------|----------|----------|
| <b>XRTC</b> | <b>4040</b> | <b>12</b> | <b>S</b> | <b>1R0</b> | <b>M</b> | <b>B</b> | <b>C</b> | <b>A</b> |
| ①           | ②           | ③         | ④        | ⑤          | ⑥        | ⑦        | ⑧        | ⑨        |

①Series Name: Mini Molding Power Inductors

②External Dimensions(L×W):4040=4.0\*4.0 mm

③External Dimensions(H):12=1.2 mm

④Size Tolerance:S=±0.2mm

⑤Inductance value:1R0=1.0uH

⑥Tolerance:M=±20%

⑦Coating color:B=Black

⑧Product type:C=Common

⑨Special define:A=Routine

For special characteristics, please refer to the specific values in Item 5 "Specifications".

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## 3. SHAPE AND DIMENSIONS

Outline Dimensions



Recommend Land Pattern Dimensions



Units:mm

| Series      | L       | G       | W       | E        | T        | A    | B    | C    |
|-------------|---------|---------|---------|----------|----------|------|------|------|
| XRTC404012S | 4.1±0.2 | 1.3±0.2 | 4.1±0.2 | 1.40±0.2 | 1.20Max. | 4.10 | 1.10 | 4.10 |

## 4. Marking

No Marking

## 5. Specifications

| P/N                | L0(μH)<br>@ (0A) 1MHz | Rdc(mΩ) |     | Heat rating current<br>Irms(A) |     | Saturation current<br>Isat(A) |     |
|--------------------|-----------------------|---------|-----|--------------------------------|-----|-------------------------------|-----|
|                    |                       | Typical | Max | Typical                        | Max | Typical                       | Max |
| XRTC404012S1R0MBCA | 1.0                   | 21      | 25  | 6.3                            | 5.5 | 11                            | 10  |

Test remarks

Note 1.: All test data is referenced to 25 °C ambient.

Note 2.: Test Condition:1MHz, 1.0Vrms.

Note 3.: Irms:DC current (A) that will cause an approximate ΔT of 40 °C.

Note 4.: Isat:DC current (A) that will cause L0 to drop approximately 30%.

Note 5.: Operating Temperature Range -55°C to +125°C.

Note 6.: The part temperature (ambient + temp rise) should not exceed 125 under °C the worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provision all affect the part temperature. Part temperature should be verified in the end application.

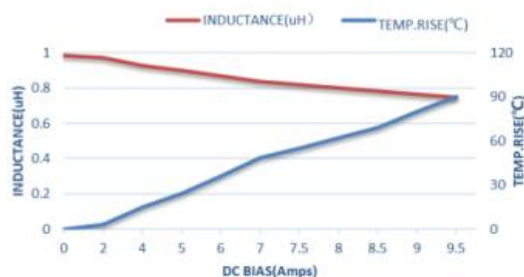
Note 7.: The rated current as listed is either the saturation current or the heating current depending on which value is lower.

## 6. Structure



## 7. Current Characteristic

XRTC404012S1R0MBCA



### 8. Reliability

| Item                         | Requirements                                                                         | Test Methods and Remarks                                                                                                                                                                                                                                                                                                           |
|------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation Resistance        | $\geq 100\text{M}\Omega$                                                             | 100 VDC between inductor coil and The middle of the top surface of the body for 60 seconds.                                                                                                                                                                                                                                        |
| Solderability                | 90% or more of electrode area shall be coated by new solde.                          | Dip pads in flux .<br>Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free).<br>Solder Temperature: $245 \pm 5^\circ\text{C}$ .<br>Immersion Time: $(5 \pm 1)$ s.                                                                                                                                                                            |
| Resistance to Soldering Heat | No visible mechanical damage.<br>Inductance change: Within $\pm 10\%$ .              | Dip pads in flux.<br>Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free).<br>Solder Temperature: $260 \pm 5^\circ\text{C}$ .<br>Immersion Time: $10 \pm 1$ sec.                                                                                                                                                                            |
| Adhesion of teral electrode  | Strong bond between the pad and the core, without come off PCB.                      | Inductors shall be subjected to $(260 \pm 5)^\circ\text{C}$ for $(20 \pm 5)$ s<br>Soldering in the base whit 0.3mm solder.<br>And then aplombelectrode way plus tax 12 N for $(10 \pm 1)$ seconds.                                                                                                                                 |
| High temperature             | No case deformation or change in appearance.<br>Inductance change: Within $\pm 10\%$ | Temperature: $125 \pm 2^\circ\text{C}$ .<br>Time : 1000 hours.<br>Measurement at $24 \pm 4$ hours after test conclusion.                                                                                                                                                                                                           |
| Low temperature              | No visible mechanical damage.<br>Inductance change: Within $\pm 10\%$                | Temperature: $-55 \pm 2^\circ\text{C}$ .<br>Time : 1000 hours.<br>Measurement at $24 \pm 4$ hours after test conclusion.                                                                                                                                                                                                           |
| Thermal shock                | No visible mechanical damage.<br>Inductance change: Within $\pm 10\%$                | The test sample shall be placed at $(-55 \pm 3)^\circ\text{C}$ and $(125 \pm 3)^\circ\text{C}$ for $(30 \pm 3)$ , different temperature conversion time is 2~3 utes.<br>The temperature cycle shall be repeated 32 cycles. Placed at room temperature for 2 hours, within $48 \pm 4$ hours of testing.                             |
| Temperature characteristic   | Inductance change Pc-b,Pc-d:<br>Within $\pm 10\%$                                    | a: $+20^\circ\text{C}$ (30~45) $\rightarrow$<br>b: $-40^\circ\text{C}$ (30~45) $\rightarrow$<br>c: $+20^\circ\text{C}$ (30~45) $\rightarrow$<br>d: $+125^\circ\text{C}$ (30~45) $\rightarrow$<br>e: $+20^\circ\text{C}$ (30~45)<br>$P_{c-b} = \frac{L_b - L_c}{L_c} \times 100\%$ ; $P_{c-d} = \frac{L_d - L_c}{L_c} \times 100\%$ |
| Static Humidity              | No visible mechanical damage.<br>Inductance change: Within $\pm 10\%$                | Inductors shall be subjected to $(95 \pm 3)\% \text{RH}$ .<br>at $(60 \pm 2)^\circ\text{C}$ for $(1000 \pm 4)$ h.<br>Placed at room temperature for 2 hours, within 48 hours of testing.                                                                                                                                           |
| Life                         | No visible mechanical damage.<br>Inductance change: Within $\pm 10\%$                | Inductors shall be store at $(85 \pm 2)^\circ\text{C}$ for $(1000 \pm 4)$ hours with Irms applied.<br>Placed at room temperature for 2 hours, within 48 hours of testing                                                                                                                                                           |

## 9. Soldering Condition

(This is for recommendation, please customer perform adjustment according to actual application)

Recommend Reflow Soldering Profile : (solder : Sn96.5 / Ag3 / Cu0.5)



| Profile Feature                                                                                                 | Lead (Pb)-Free solder |
|-----------------------------------------------------------------------------------------------------------------|-----------------------|
| Preheat:                                                                                                        |                       |
| Temperature Min (T <sub>min</sub> )                                                                             | 150°C                 |
| Temperature Max (T <sub>max</sub> )                                                                             | 200°C                 |
| Time (T <sub>min</sub> to T <sub>max</sub> ) (ts)                                                               | 60 -120 seconds       |
| Average ramp-up rate:<br>(Ts max to Tp)                                                                         | 3°C / second max.     |
| Time maintained above :                                                                                         |                       |
| Temperature (T <sub>L</sub> )                                                                                   | 217°C                 |
| Time (t <sub>L</sub> )                                                                                          | 60-150 seconds        |
| Peak Temperature (Tp)                                                                                           | 260°C                 |
| Time within $\begin{matrix} +0^{\circ}\text{C} \\ -5 \end{matrix}$ of actual peak Temperature (tp) <sup>2</sup> | 10 seconds            |
| Ramp-down Rate                                                                                                  | 6°C/second max.       |
| Time 25°C to Peak Temperature                                                                                   | 8minutes max.         |

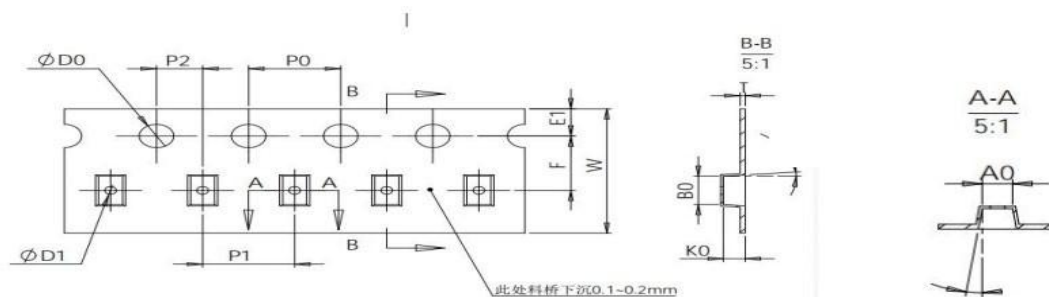
Allowed Re-flow times : 2 times

Remark : To avoid discoloration phenomena of chip on terminal electrodes, please use N<sub>2</sub> Re-flow furnace .

## 10. Packing

### 10I Dimension of plastic taping: (Unit: mm)

The following dimensions are related to the actual fit of the machine, for reference only.

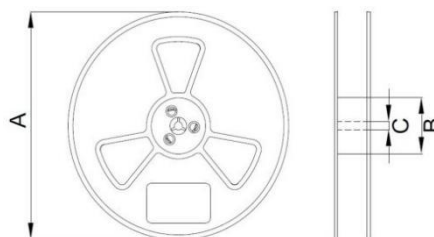


| Series | W         | A0        | B0        | D0      | D1    | E     |
|--------|-----------|-----------|-----------|---------|-------|-------|
| 公差     | /         | /         | /         | +0.1/-0 | ±0.20 | ±0.10 |
| 404012 | 12.0±0.30 | 4.40±0.10 | 4.40±0.10 | 1.5     | 1.5   | 1.75  |

| Series | F     | K0        | P0    | P2    | P1    | T     | 包装数量 |
|--------|-------|-----------|-------|-------|-------|-------|------|
| 公差     | ±0.10 | /         | ±0.10 | ±0.10 | ±0.10 | ±0.05 |      |
| 404012 | 5.5   | 1.30±0.10 | 4.0   | 2.0   | 8.0   | 0.30  |      |

### 10II Dimension of Reel : (Unit: mm)

| Type | A    | B    | C    |
|------|------|------|------|
| All  | ±2.0 | ±2.0 | ±2.0 |
| All  | 178  | 60   | 13   |



## 11. Note

- 11I recommend products store in warehouse with temperature between 15 to 35℃ under humidity between 25 to 75%RH. Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 yearold.
- 11II Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 11III Storage conditions as below are inappropriate:
  - a. Stored in high electrostatic environment
  - b. Stored in direct sunshine, rain, snow or condensation.
  - c. Exposed to sea wind or corrosive gases, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>, etc.
- 11IV The products are used in circuit board thickness greater than 1.6mm. If customers use less than the thickness of the circuit board that you should confirm with the company, in order to recommend a more suitable product.

## 12. Record

| Version | Description   | Page | Date       | Amended by | Checked by  |
|---------|---------------|------|------------|------------|-------------|
| A0      | First version | 1~5  | Nov.6.2023 | Chen.Zhang | Congdian.Lu |