

Specification Sheet for Approved

| | |
|--------------------|-------------------|
| Customer Name: | |
| Customer Part No.: | |
| Ceaiya Part No: | MTC252012S Series |
| Spec No: | T2512 |

【For Customer Approval Only】

If you Approval, Please Stamp

【RoHS Compliant Parts】

| Approved By | Checked By | Prepared By |
|-------------|------------|-------------|
| 李庆辉 | 苏高峰 | 劳水花 |

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Specification Sheet for SMD Power Inductor

【Version of Changed Record】

| Rev. | Effective Date | Changed Contents | Change Reasons | Approved By |
|------|----------------|------------------|----------------|-------------|
| A0 | 2024-05-23 | New release | / | Li qing hui |
| | | | | |

Specification Sheet for SMD Power Inductor

1. Scope

This specification applies to the MTC252012S Series of wire wound SMD power inductor.

2. Product Description and Identification (Part Number)

1) Description:

MTC252012S series of Wire wound SMD power inductor.

2) Product Identification (Part Number)

MTC 252012 S - R47 M T
 ① ② ③ ④ ⑤ ⑥

| | |
|--------|---------------------------------|
| ① Type | |
| MTC | Mini Molded Chip Power Inductor |

| | |
|-----------------------------------|-------------|
| ② External Dimensions(L×W×H) 【mm】 | |
| 252012 | 2.5×2.0×1.2 |

| | |
|----------------|------------------|
| ③ Feature type | |
| S | Standard Product |

| | |
|----------------------|---------|
| ④ Nominal Inductance | |
| Example | Example |
| R24 | 0.24uH |
| 1R0 | 1.0uH |
| 100 | 10uH |

| | |
|------------------------|------|
| ⑤ Inductance Tolerance | |
| N | ±30% |
| M | ±20% |

| | |
|-----------|----------------------|
| ⑥ Packing | |
| T | Tape Carrier Package |

3. Electrical Characteristics

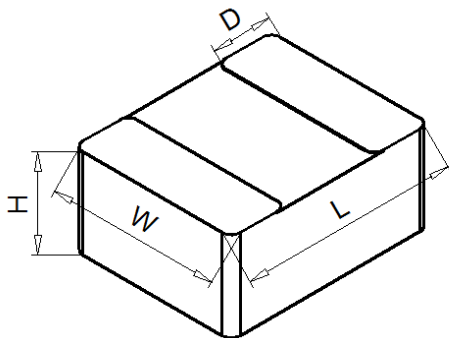
Please refer to Item 5.

- 1) Operating temperature range (individual chip without packing): -40°C ~ +125°C (Including Self-heating)
- 2) Storage temperature range (packaging conditions): -10°C ~ +40°C and RH 70% (Max.).

4. Shape and Dimensions (Unit:mm)

Dimensions and recommended PCB pattern for reflow soldering, please see Fig4-1 and Table4-1

Shape and Dimensions:



Recommended pad:

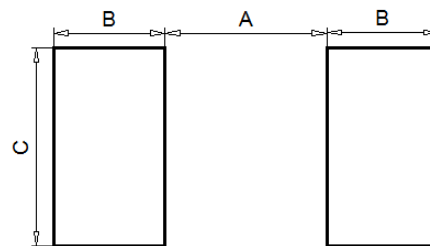


Fig4-1.

Table 4-1.

| | | | | | | |
|---------|---------|--------|----------|--------|--------|--------|
| L | W | H | D | A | B | C |
| 2.5±0.2 | 2.0±0.2 | 1.2Max | 0.80±0.2 | 0.8Ref | 1.0Ref | 2.0Ref |

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5. Electrical Characteristics

| Part Number | Inductance | DC Resistance | | Saturation Current | | Heat Rating Current | |
|------------------|------------|---------------|------|--------------------|------|---------------------|------|
| | 1MHz/1V | Max. | Typ. | Max. | Typ. | Max. | Typ. |
| Units | uH | mΩ | mΩ | A | A | A | A |
| Symbol | L | DCR | | Isat | | Irms | |
| MTC252012S-R47MT | 0.47 ± 20% | 17 | 14 | 5.90 | 6.40 | 4.90 | 5.40 |
| MTC252012S-R68MT | 0.68 ± 20% | 22 | 17 | 5.60 | 6.20 | 4.70 | 5.40 |
| MTC252012S-1R0MT | 1.0 ± 20% | 30 | 24 | 4.90 | 5.50 | 4.30 | 4.80 |
| MTC252012S-1R5MT | 1.5 ± 20% | 52 | 40 | 4.10 | 4.50 | 3.20 | 3.60 |
| MTC252012S-2R2MT | 2.2 ± 20% | 66 | 55 | 3.30 | 3.80 | 2.20 | 2.50 |
| MTC252012S-4R7MT | 4.7 ± 20% | 190 | 160 | 2.20 | 2.60 | 1.70 | 2.00 |

Note:※1: Rated current: Isat(max.)or Irms(max.),whichever is smaller;

※2: Saturation Current: Max. Value, DC current at which the inductance drops less than 30% from its value without current; Typ. Value, DC current at which the inductance drops 30% from its value without current;

※3: Irms: DC current that causes the temperature rise (ΔT) from 20°C ambient.

For Max. Value, $\Delta T < 40^\circ\text{C}$; for Typ. Value, ΔT is approximate 40°C.

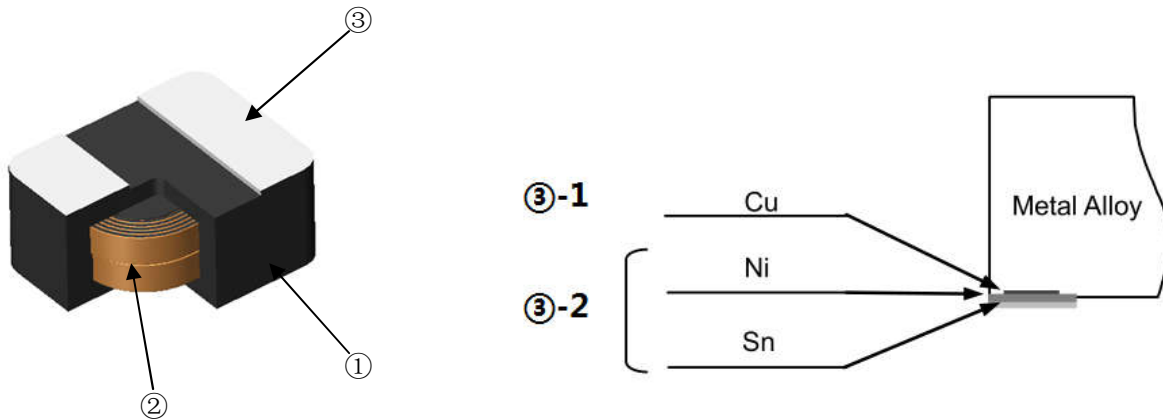
The part temperature (ambient + temp. rise) should not exceed 125°C under worst case operating conditions.

Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

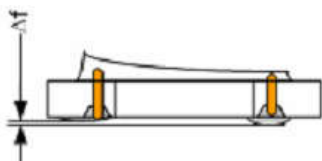
※4: Absolute maximum voltage: DC 25V

6. Structure

The structure of MTC252012S product.



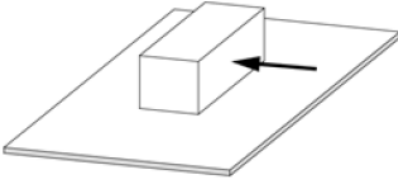
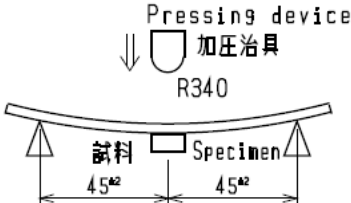
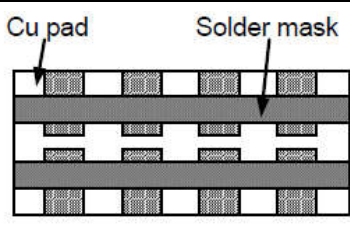
| NO. | Components | Material |
|-----|------------|--|
| ① | Core | Soft magnetic Metal |
| ② | Wire | Polyurethane system enameled copper wire |
| ③-1 | Electrodes | Inside Cu |
| ③-2 | | Ni+Sn Plating Chemicals |



Δf: Clearance between terminal and the surface of plate must be 0.12mm max when coil is placed on a flat plate.

Specification Sheet for SMD Power Inductor

6. Reliability Test

| Items | Requirements | Test Methods and Remarks |
|---|--|--|
| 7.1 Bonding Strength | | It shall be soldered on the substrate. Applying Force(F): 10N Hold Duration: 5s  |
| 7.2 Bending Strength | Chip coil shall not be damaged. | Substrate: Glass-epoxy substrate (100×40×1.0mm) Speed of Applying Force: 0.5mm / s Deflection: 2mm Hold Duration: 20s  |
| 7.3 Vibration | No visible mechanical damage. Inductance change: Within $\pm 10\%$  | 1) Solder the inductor to the testing jig (glass epoxy board) using eutectic solder. 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 55Hz. 3) The frequency range from 10 to 55Hz and return to 10Hz shall be traversed in approximately 1 minute. this motion shall be applied for a period of 2 hours in each 3mutually perpendicular directions (total of 6 hours). |
| 7.4 Solderability | The wetting area of the electrode shall be at least 90% covered with new solder coating. | Flux: Ethanol solution of rosin, 25(wt)% Solder : Sn-3.0Ag-0.5Cu Pre-Heating: 150±10°C / 60 to 90s Solder Temperature: 245±5°C Immersion Time: 3 s |
| 7.5 Resistance to Soldering Heat | Appearance: No damage Inductance Change : within $\pm 10\%$ | Reflow soldering method Flux: Ethanol solution of rosin, 25(wt)% Solder: Sn-3.0Ag-0.5Cu Pre-Heating: 150 to 180°C / 60 to 120s Solder Temperature: 230°C min. / 20 to 40s Peak Temperature: 250+5/-0°C Reflow times: 2 times max Test board shall be 0.8 mm thick. Base material shall be glass epoxy resin. Then measured after exposure Standard atmospheric conditions for 1~2h. |

Specification Sheet for SMD Power Inductor

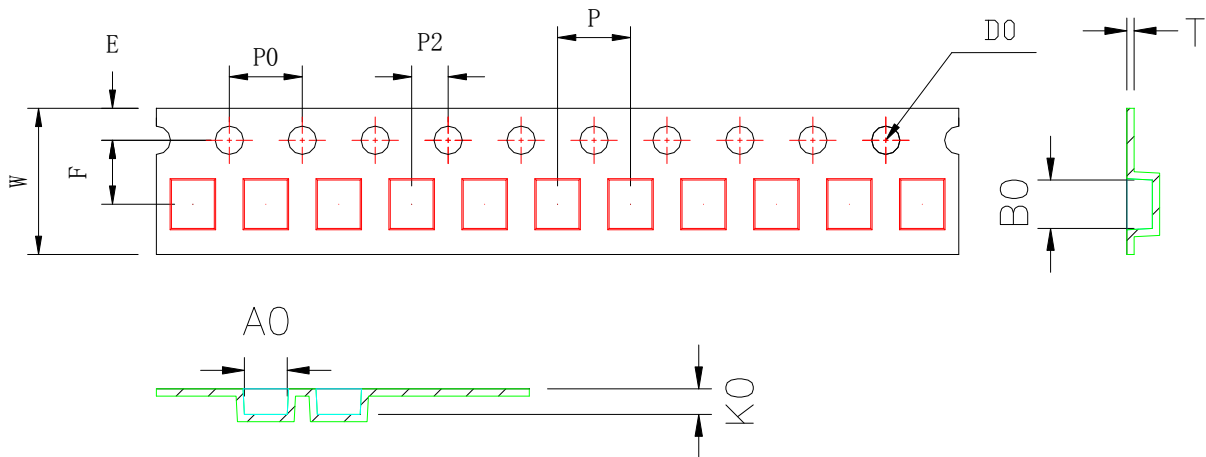
7. Reliability Test

| Items | Requirements | Test Methods and Remarks |
|-----------------------------|--|--|
| 7.6 Heat Resistance | Appearance: No damage Inductance Change : within $\pm 10\%$ | Temperature: $125 \pm 2^\circ\text{C}$ Time: 500h ($\pm 12\text{h}$) Then measured after exposure Standard atmospheric conditions for 1~2h. |
| 7.7 Cold Resistance | | Temperature: $-40 \pm 2^\circ\text{C}$ Time: 500h ($\pm 12\text{h}$) Then measured after exposure Standard atmospheric conditions for 1~2h. |
| 7.8 Humidity | | Temperature: $40 \pm 2^\circ\text{C}$ Humidity: 90 to 95%(RH) Time: 500h ($\pm 12\text{h}$) Then measured after |
| 7.9 Temperature Cycle | | 1 cycle: 1 step: $-40 \pm 2^\circ\text{C}$ / 30 \pm 3m 2 step: Ordinary temp. / 3m max. 3 step: $+125 \pm 2^\circ\text{C}$ / 30 \pm 3m 4 step: Ordinary temp. / 3m max. Total of 100 cycles Then measured after exposure Standard atmospheric conditions for 1~2h. |

Specification Sheet for SMD Power Inductor

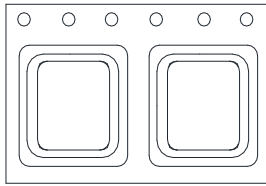
8.Packaging and Marking:

8-1.Carrier Tape Dimensions:



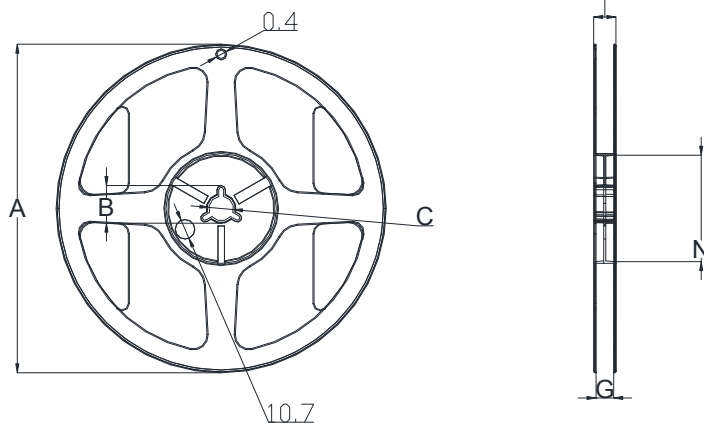
| ITEM | W | A0 | B0 | K0 | P | F | E | D0 | P0 | P2 | T |
|------|------|------|------|------|------|------|------|------|------|------|-------|
| DIM | 8.00 | 2.35 | 2.65 | 1.4 | 4.00 | 3.5 | 1.75 | 1.50 | 4.00 | 2.00 | 0.25 |
| TOLE | ±0.3 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | +0.1 | ±0.1 | ±0.1 | ±0.05 |

8-2.Taping Dimensions:



8-3.Reel Dimensions:

Carrier Tape Reel



| Type | A | B | C | G | N | T |
|------|-----|----------|--------|---|----|------|
| 8mm | 178 | 20.7±0.8 | 13±0.4 | 9 | 60 | 10.8 |

8-4. Packaging Quantity:

3KPCS/ Reel

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