



# 承認書

## SPECIFICATION FOR APPROVAL

CUSTOMER:

DESCRIPTION:

SMD INDUCTOR

PART NO:

MCNRA4012A系列

CUST. PART NO:

REV. NO.

A0

| DRAWING  |          |          |
|----------|----------|----------|
| PREPARED | CHECKED  | APPROVED |
| 邹声平      | 卢嘉良      | 曾凡强      |
| DATE:    | 2025/5/5 |          |

| CUSTOMER APPROVE |
|------------------|
|                  |

**DDY® 德立电子 & 铭易轩**

**东莞市铭易轩电子科技有限公司**

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## MODIFY RECORD 变更履历

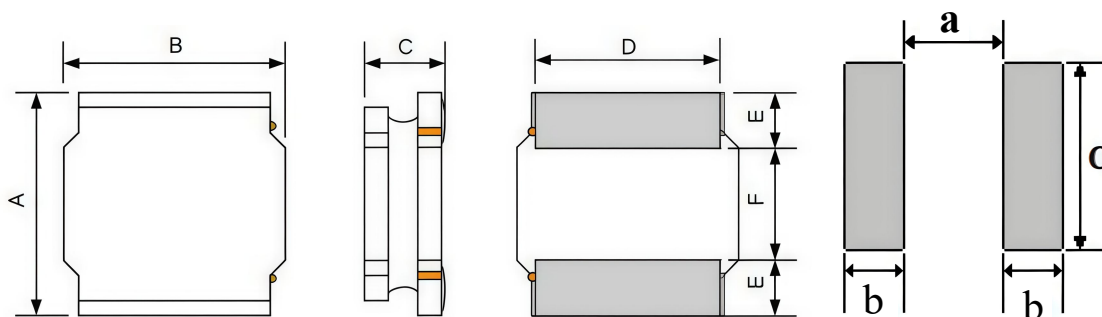
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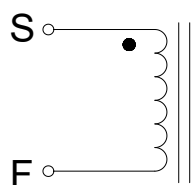
### 1. SHAPE & DIMENSION (UNIT:mm)



Recommended patterns

| A       | B       | C        | D       | E        | F        | a        | b         | c        |
|---------|---------|----------|---------|----------|----------|----------|-----------|----------|
| 4.0±0.2 | 4.0±0.2 | 1.2 Max. | 3.4±0.2 | 1.0 Typ. | 2.0 Typ. | 1.8 Typ. | 1.20 Typ. | 3.6 Typ. |

### 2. SCHEMATIC



### 3. PART NUMBERING SYSTEM

MCNRA 4012 A - 1R0 N  
① ② ③ ④ ⑤

- ① PRODUCT SYMBOL (产品代号: MCNRA合金)
- ② DIMENSIONS (规格尺寸)
- ③ Edge type(边型):A=12边; B=8边; C=4边
- ④ Inductance Value: (电感标称值)
- ⑤ TOLERANCE: (公差) : K±10%; M±20%; N±30%

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### 4. ELECTRICAL CHARACTERISTICS

| No. | Part Number     | Inductance | DC Resistance |          | Isat(A) |      | Irms(A) |      | Marking |
|-----|-----------------|------------|---------------|----------|---------|------|---------|------|---------|
|     |                 | 1MHz/0.1V  | Max.          | Typ.     | Max.    | Typ. | Max..   | Typ. |         |
|     | Units           | (uH)       | $\Omega$      | $\Omega$ | A       | A    | A       | A    |         |
| 1   | MCNRA4012A-R68N | 0.68±30%   | 0.046         | 0.037    | 5.00    | 5.60 | 4.00    | 4.70 | N/A     |
| 2   | MCNRA4012A-1R0N | 1.0±30%    | 0.066         | 0.053    | 4.50    | 5.30 | 3.60    | 4.20 | N/A     |
| 3   | MCNRA4012A-1R5N | 1.5±30%    | 0.070         | 0.056    | 3.90    | 4.50 | 3.20    | 3.90 | N/A     |
| 4   | MCNRA4012A-2R2M | 2.2±20%    | 0.102         | 0.082    | 2.50    | 2.80 | 2.30    | 2.80 | N/A     |
| 5   | MCNRA4012A-3R3M | 3.3±20%    | 0.145         | 0.096    | 2.30    | 2.60 | 2.20    | 2.50 | N/A     |
| 6   | MCNRA4012A-4R7M | 4.7±20%    | 0.187         | 0.15     | 2.30    | 2.60 | 1.90    | 2.20 | N/A     |
| 7   | MCNRA4012A-6R8M | 6.8±20%    | 0.255         | 0.188    | 1.60    | 2.20 | 1.60    | 1.90 | N/A     |
| 8   | MCNRA4012A-100M | 10.0±20%   | 0.408         | 0.325    | 1.40    | 1.80 | 1.10    | 1.50 | N/A     |
| 9   | MCNRA4012A-150M | 15.0±20%   | 0.632         | 0.506    | 1.20    | 1.60 | 0.90    | 1.25 | N/A     |
| 10  | MCNRA4012A-220M | 22.0±20%   | 0.763         | 0.611    | 1.10    | 1.35 | 0.75    | 0.95 | N/A     |

#### Test remarks

- (1). All test data is referenced to 25 °C ambient.
- (2). Isat: DC current at which inductance drops approximate 30% from its value without current.
- (3).Irms: DC current that causes the temperature rise ( $\Delta T \leq 40^{\circ}\text{C}$ ) from 25°C ambient.
- (4).Absolute maximum voltage: DC 25V;

### 5. GENERAL SPECIFICATION

- (1). Operating temp.: -40°C ~ +125°C (Including self-generated heat).
- (2). Storage temp.: -40°C ~ +85°C R.H.:70% Max.
- (3). Recommended products should be used within 12 months from the date of delivery
- (4). The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

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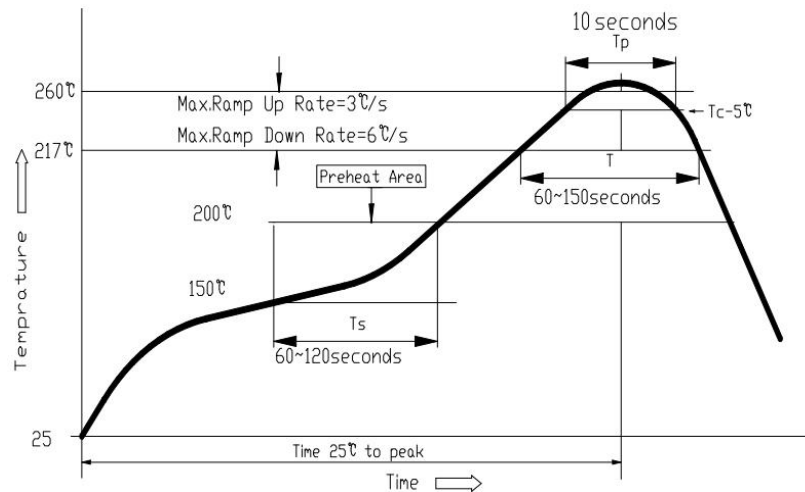


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### 6. SOLDERING CONDITIONS

**Figure 1. Re-flow Soldering (Lead Free)**



Note:

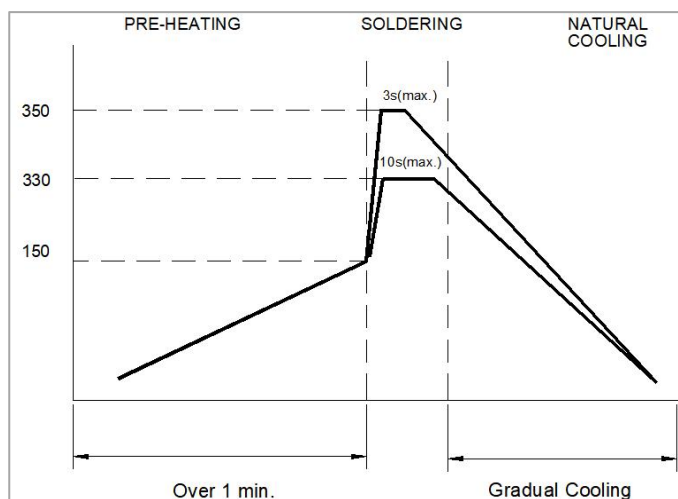
Preheat circuit and products to 150°C

260°C tip temperature (Max)

Reflow times: no more than 2 times

Solder paste thickness: the best 0.08mm is ,but max is 0.1mm

**Figure 2. Hand Soldering**



Note:

Use a 20 watt soldering iron with tip diameter of 1.0mm

Limit soldering time to 3 sec.

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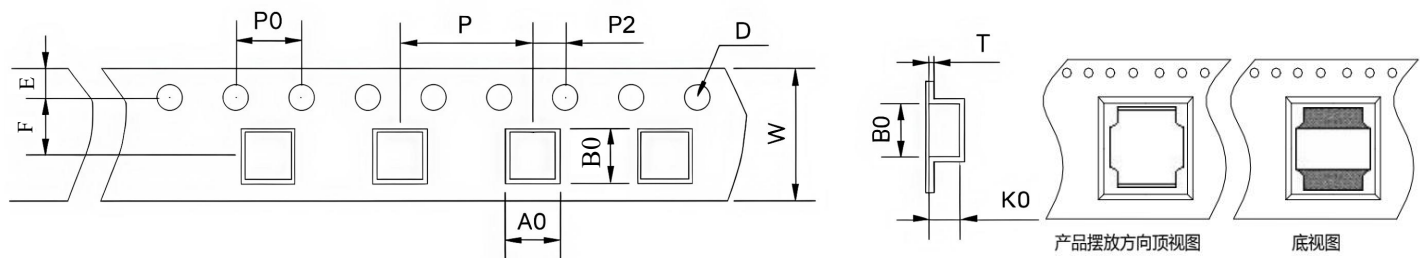


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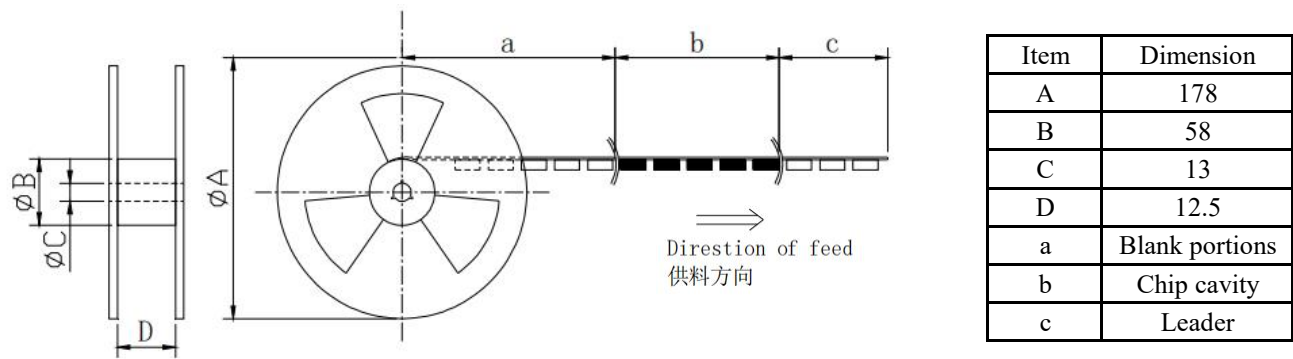
7. PACKAGE SPECIFICATION

(1). Tape Dimensions(Unit:mm)



| W            | A0           | B0           | K0          | D                | E            | F           | P           | P0          | P2          | T            |
|--------------|--------------|--------------|-------------|------------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 12.0<br>±0.3 | 4.40<br>±0.2 | 4.40<br>±0.2 | 1.4<br>±0.1 | 1.5<br>+0.1/-0.1 | 1.75<br>±0.1 | 5.5<br>±0.1 | 8.0<br>±0.1 | 4.0<br>±0.2 | 2.0<br>±0.1 | 0.30<br>±0.1 |

(2). Reel Dimensions (Unit:mm)

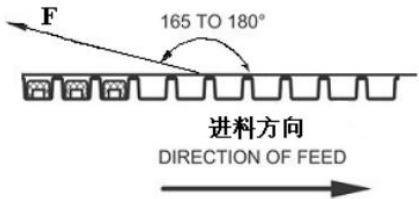


(3). Packaging Quantity

| Reel (pcs) | Box (pcs) | Carton (pcs) |
|------------|-----------|--------------|
| 4500       | 18000     | 54,000       |

(4). Packaging -Cover Tape

F force: 10~130g  
Peeling speed: 300mm/min±10%  
Peeling angle: 165°~180°



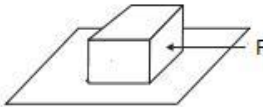
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### 8. RELIABILITY

| No. | Item                             | Requirements                                                                                                                           | Test Methods and Remarks                                                                                                                                                                                                                |
|-----|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | High temperature Storage test    | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (N: Follow the product specification for the setting.)<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours         |
| 2   | Low temperature Storage test     | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (M: Follow the product specification for the setting)<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours.         |
| 3   | Humidity test                    | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | Temperature: $40 \pm 2^{\circ}\text{C}$ , Humidity: $93 \pm 3\% \text{RH}$<br>Time : $96 \pm 2$ hours<br>Place the samples for one hour at room temperature and test them within two hours                                              |
| 4   | Solderability test               | Terminals must have 95% minimum solder coverage                                                                                        | 1. Dip pads in flux then dip in solder pot at $245 \pm 5^{\circ}\text{C}$ for 5 second.<br>2. Solder: lead free<br>3. Flux: rosin flux                                                                                                  |
| 5   | Heat endurance of flow soldering | 1. No significant defects in appearance.<br>2. $\Delta L/L \leq 10\%$<br>3. $\Delta DCR/DCR \leq 10\%$                                 | 1. Refer to the above reflow curve and go through the reflow for twice.<br>2. The peak temperature : $260 \pm 0/-5^{\circ}\text{C}$                                                                                                     |
| 6   | Vibration test                   | 1. No significant defects in appearance.<br>2. No short and no open.                                                                   | Apply frequency 10~55~10Hz and amplitude 1.5mm, 1 min/cycle in X Y and Z direction for 2 hours each. (total 6 hours)                                                                                                                    |
| 7   | Terminal strength push tes       | 1. Applied force: 10N Duration: 10sec<br>2. Solder paste thickness: 0.12mm<br>3. Meet the above requirements without any loose termina | Solder the test samples to the PCB through $245^{\circ}\text{C}$ reflow, apply a standard force on the side of the test samples for 10 seconds.<br> |

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