

CUSTOMER: _____

DATE: _____

APPROVAL SPECIFICATION

PRODUCT NAME: SMD power inductor

YOUR PART NO. :

OUR PART NO. : MGSFD4D22-100M-LF

VERSION: V1.0

| | | |
|---|-------------|-------------|
| <p>RECEPTION</p> <p>THE SPECIFICATION HAS BEEN ACCEPTED.</p> <p style="text-align: right;">DATE:</p> <p>COMPANY:</p> | | |
| CFMD | CHKD | RCVD |

MANUFACTURING NAME

深圳市麦捷微电子科技股份有限公司
 SHENZHEN MICROGATE TECHNOLOGY CO., LTD
 Address: Yuxing road, Golf Street, Guanlan Town
 Bao' an District Shenzhen P. R. C
 Postcode :518110
 TEL: 86-755-28085000
 FAX: 86-755-28085605

| | | |
|--------------|--------------|--------------|
| CFMD. | CHKD. | DSGD. |
| Charles | 王玉生 | 刘维 |

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Component SPEC Version Record

| Rev. | Effective Date | Changed Contents | Change Reasons | Approved By |
|------|----------------|------------------|----------------|-------------|
| 1.0 | Dec. 10.2012 | New released | / | Charles |
| | | | | |

1. Scope

This specification applies to the MGSFD series of SMD power inductor.

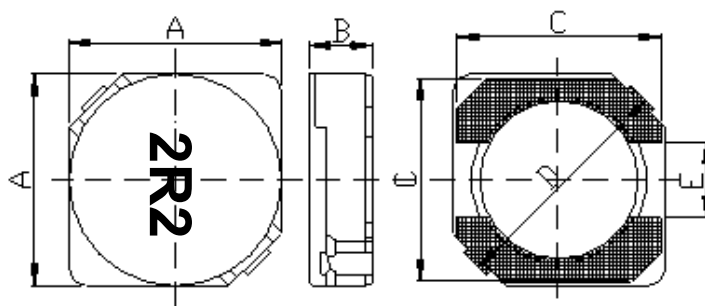
2. Product Identification

MGSFD 4D22 - 4R7 N - LF
① ② ③ ④ ⑤

- ① Product Symbol
- ② Product dimensions
- ③ Inductance Value: (4R7: 4.7uH 100: 10uH; 101: 100uH)
- ④ Inductance Tolerance: (K:10% ; M:20% ;N:30%)
- ⑤ Lead free product.

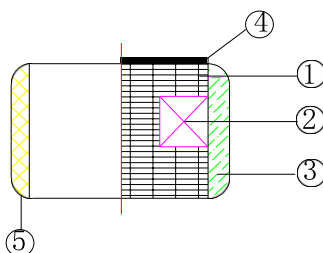
3. Appearance, Dimensions and Material

3.1 Appearance and dimensions



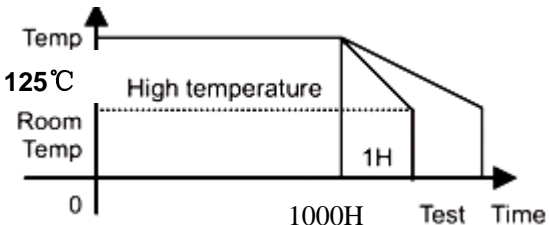
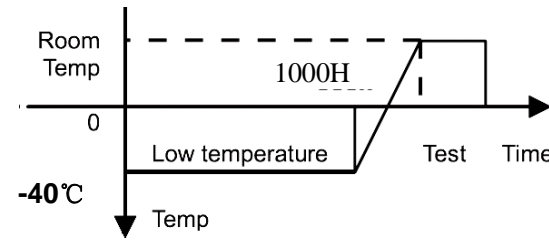
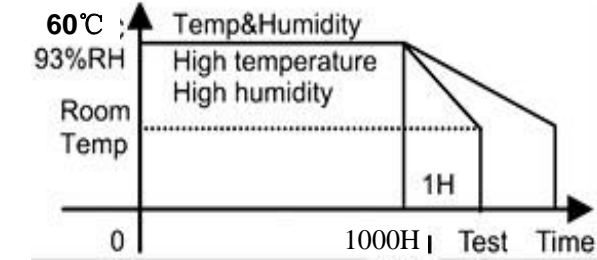
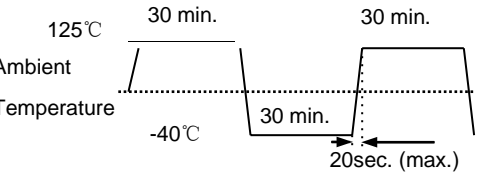
| Dimensions in mm | | | | | |
|------------------|---------|---------|--------|----------|--------|
| Model | A | B | C | D | E |
| MGSFD4D22 | 4.7±0.3 | 2.5 max | 5.3typ | 6.9 max. | 1.5ref |

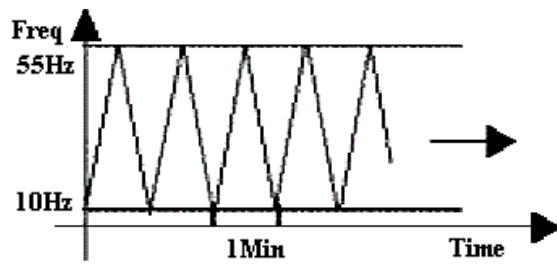

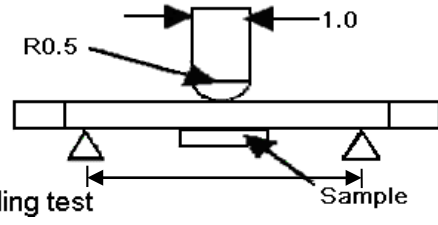
3.2 Material List



| No. | Part name | Material | Ceaiya P/N |
|-----|-----------|-----------------------------------|--------------|
| ① | Drum Core | Ni-Zn Ferrite Core | (RL B1.2) |
| ② | Wire | Polyurethane enameled copper wire | 9310100 |
| ③ | Ring Core | Ni-Zn Ferrite Core | (RL) |
| ④ | Adhesive | Epoxy Resin | 7001007(001) |
| ⑤ | Electrode | Cu + Sn plating | (LC) |

7. Reliability and Test Condition

| Item | Required Characteristics | Test Method/Condition |
|-----------------------------|---|--|
| High temperature resistance | | <p>Temperature: $125 \pm 2 \text{ }^\circ\text{C}$ Time : 1000 hours Tested not less than 1 hours, nor more than 2 hours at room temperature.</p>  |
| Low temperature resistance | <ol style="list-style-type: none"> No case deformation or change in appearance. $\Delta L /L \leq 10\%$ | <p>Temperature : $-40 \pm 2 \text{ }^\circ\text{C}$ Time : 1000 hours Tested not less than 1 hour, nor more than 2 hours at room temperature.</p>  |
| Humidity test | | <ol style="list-style-type: none"> Exposure : Temperature: $60 \pm 2 \text{ }^\circ\text{C}$, Humidity : $93 \pm 3\%$ RH Time : 1000 hours. Tested while the specimens are still in the chamber. Tested not less than 1 hour, nor more than 2 hours at room temperature.  |
| Thermal shock test | <ol style="list-style-type: none"> No case deformation or change in appearance. $\Delta L /L \leq 10\%$ | <p>First -40°C for T time, last 125°C T time as 1 cycle. Go through 100 cycles.</p>  |

| Item | Required Characteristics | Test Method/Condition |
|------------------------------------|--|---|
| Solderability test | Terminal area must have 90% min. solder coverage. | Dip pads in flux then dip in solder pot at $245 \pm 5^{\circ}\text{C}$ for < 5 second. Solder: lead free Flux: rosin flux. |
| Heat endurance of reflow soldering | | Refer to the next page reflow curve Go through 3 times. The peak temperature: $260+5/-0^{\circ}\text{C}$ |
| Vibration test | 1. No case deformation or change in appearance. 2. $ \Delta L /L \leq 10\%$ | Apply frequency 10~55Hz. 1.5mm amplitude in each of perpendicular direction for 2 hours in each 3 mutually perpendicular directions.(total 6 hours)  |
| Drop test | | Packaged & drop down from 1m with $981\text{m/s}^2(100\text{G})$ attitude in 1 angle 1 ridges & 2surfaces orientations. |
| Terminal strength push test | Pulling test: Define: Solder the products on testing PCB using eutectic solder. Then apply a force in the direction of the arrow. 10N force. Keep time $\geq 5\text{s}$ Bending test: Soldering the products on PCB, after the pulling test and bending test, terminal should not pull off. | Bend the testing PCB at middle point, the deflection shall be 2mm. Pressurizing Speed: 0.5mm/sec, Keep time: $30 \pm 1\text{s}$, Pulling test  Bending test  |
| Resistance to solvent test | No case deformation or change in appearance, or obliteration of marking | To dip parts into IPA solvent for 50.5Min, then drying them at room temp for 5Min., at last, to brushing marking 10 times. |
| Loading Under Humidity Heat | 1. No case deformation or change in appearance. 2. $ \Delta L /L \leq 10\%$ | 1. Exposure : Temperature: $60 \pm 2^{\circ}\text{C}$, Humidity : $93 \pm 3\%$ RH Time : 1000 hours. Apply rated current 2. Tested while the specimens are still in the chamber. 3. Tested not less than 1 hour, nor more than 2 hours at room temperature. |
| Loading at High Temperature | 1. No case deformation or change in appearance. 2. $ \Delta L /L \leq 10\%$ | 1. Temperature: $85 \pm 2^{\circ}\text{C}$ 2. Time : 1000 hours 3. Apply rated current 4. Tested not less than 1 hours, nor more than 2 hours at room temperature. |

8. Recommended Soldering Conditions

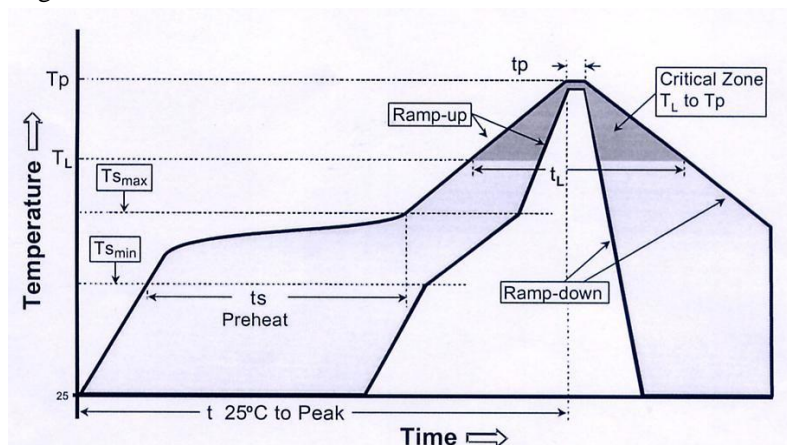
Product can be applied to flow and reflow soldering.

(1) Flux, Solder

- ① Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).
- ② Use Sn solder.

(2) Reflow soldering conditions

Reflow curve



| Profile Feature | | Lead-Free Assembly |
|--|-----------------------------|--------------------|
| Average Ramp-Up Rate (Ts max. to Tp) | | 3°C /second max. |
| Preheat | - Temperature Min (Ts min.) | 150 °C |
| | - Temperature Max (Ts max.) | 200 °C |
| | - Time (ts min to ts max.) | 60-180 seconds |
| Time maintained above | - Temperature (TL) | 217 °C |
| | - Time (tL) | 60-150 seconds |
| Peak/Classification Temperature (Tp) | | 260 °C |
| Peak/Classification Time (Tp) | | 10 seconds |
| Time within 5 °C of actual Peak Temperature (Tp) | | 20-40 seconds |
| Ramp-Down Rate | | 6°C/second max. |
| Time 25 °C to Peak Temperature | | 8 minutes max. |

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

(3) The method on Re-work with using the iron:

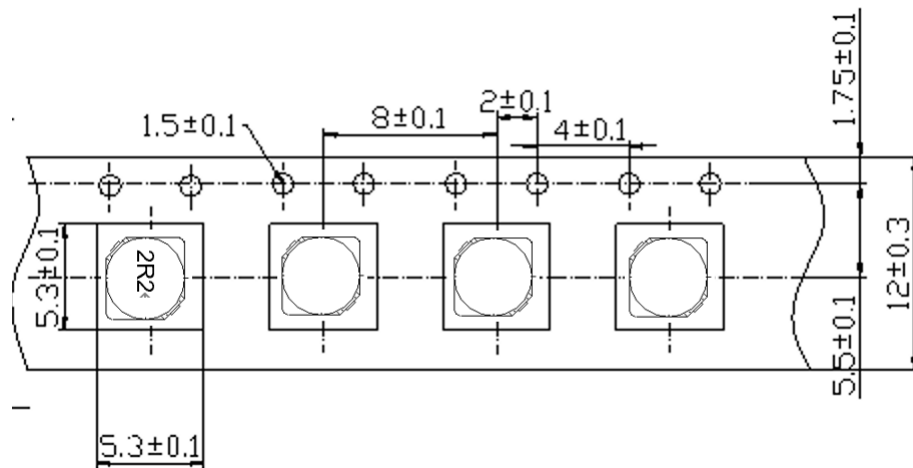
The following conditions must be strictly followed when using a soldering iron

| | |
|-----------------------|-----------------|
| Pre-heating | 150°C, 1 minute |
| Tip temperature | 350°C max |
| Soldering iron output | 80w max |
| End of soldering iron | φ1mm max |
| Soldering time | 3 seconds max |

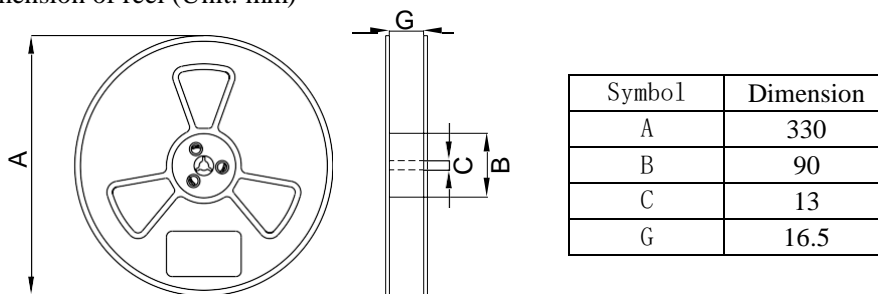
Product once removes from the circuit board may not be used again.

9. Package Information

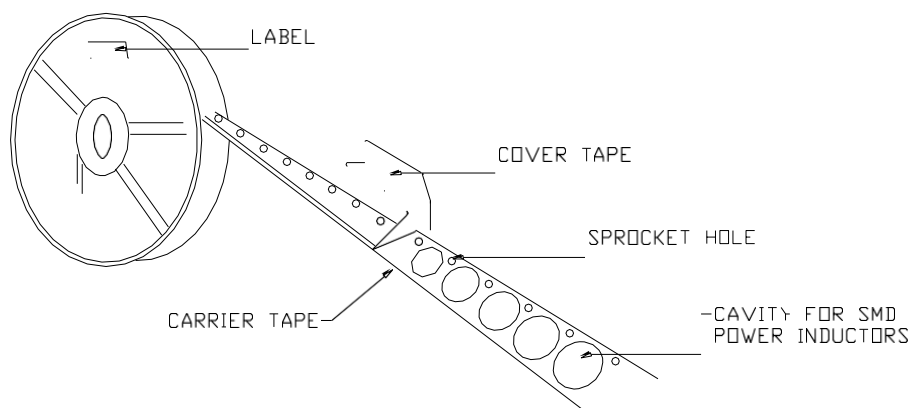
9.1 Dimension of tape (Unit: mm)



9.2 Dimension of reel (Unit: mm)



9.3 Taping figure and drawing direction



9.4 Packaging quantities: 2000PCS/Reel.

深圳市麦捷微电子科技股份有限公司

地址：深圳市宝安区观澜镇高尔夫大道裕新路

电话(Tel): 0755-28085000

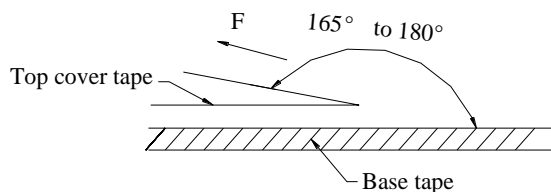
传真(Fax): 0755-28085605

邮编(Postcode): 518110

9/10

9.5 Peeling strength of cover tape:

The peel force of top cover tape shall be between 0.15N to 0.65N



| Room Temp. (°C) | Room Humidity (%) | Room aim (hpa) | Peel Speed Mm/min |
|--------------------|----------------------|-------------------|----------------------|
| 5-35 | 45-85 | 860-1060 | 300 |

10. Products Storage

(1) Storage period

Products which inspected in MICROGATE over 6 months ago should be examined and used, which can be confirmed with inspection No. marked on the container. Solderability should be checked if this period is exceeded.

(2) Storage conditions

Products should be storage in the warehouse on the following conditions:

Temperature: -10 ~+ 40°C

Humidity : Less than 80% relative and humidity

No rapid change on temperature and humidity

(3) Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solderability.

(4) Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.

(5) Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.

(6) Products should be storage under the airtight packaged condition.