

承 認 書

SPECIFICATION FOR APPROVAL

Customer Name: _____ 2144 _____

Description Part No.: _____

Customer Part No.: _____

Sample No.: _____

DDY Part No.: _____ SFEK4012A- _____

| DRAWING | | |
|-----------------|---------|----------|
| MADE | CHECKED | APPROVED |
| 王海玲 | 赵万虎 | 肖中华 |
| DATE: 2023年9月7日 | | |

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



惠州市德立电子有限公司

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Http: www.ddycoils.com



Version of Changed Record

| DATE | REV | CHANGED CONTENTS | DRAFT | APPROVED |
|----------|-----|------------------|-------|----------|
| 2023/9/7 | A | 新版发行 | 王海玲 | 肖中华 |
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*** Special notes:**
This product is non-vehicle certified.



1. Scope

This specification applies to the SFEK4012 Series of wire wound SMD power inductor.

2.PRODUCT IDENTIFICATION

SFEK 4012 □ - 1R5 □ - □
(1) (2) (3) (4) (5) (6)

- (1) .Series name (产品品名)
- (2) .Dimensions (产品尺寸)
- (3) .Appearance shape (产品形状)
A: dodecagon (十二边形) : B: octagon (八边形)
- (4) .Inductance value (电感值)
1R5: 1.5μH 221: 220μH
- (5) Tolerance (误差值)
M: ±20%; N: ±30%
- (6) .Environmental status (环保状态)
LF- Lead free; HF-Halogen free;
FP-Free red phosphor.

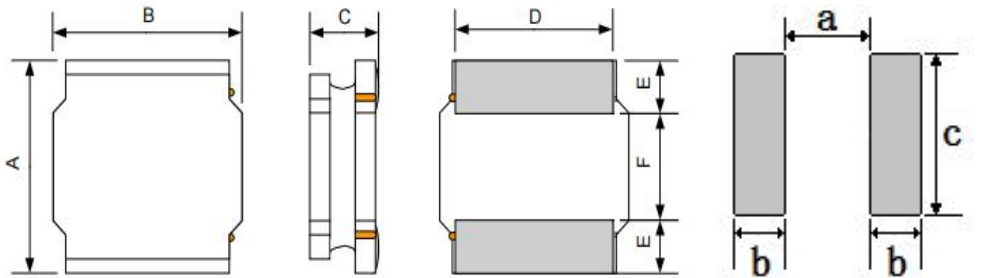
3. Electrical Characteristics

Please refer to Item 5.

- 1). Operating temperature range (individual chip without packing): -40°C ~ +125°C ;
- 2). Storage temperature range (packaging conditions): -40°C ~ +85°C and RH 70% (Max.);
- 3). Irms:DC current that causes the temperature rise ($\Delta T = 40^{\circ}C$) from 20°C ambient;
- 4). Isat: DC current at which the inductance drops approximate 30% from its value without current;
- 5). All test data is referenced to 20°C ambient;
- 6). Rated current: Isat or Irms, whichever is smaller;
- 7). Absolute maximum voltage: DC 25V;

4. Shape and Dimensions (Unit:mm)

shape: A



Recommended Land Pattern

| Series | A | B | C | D | E | F | a Typ. | b Typ. | c Typ. |
|-----------|---------|---------|----------|---------|----------|----------|--------|--------|--------|
| SFEK4012A | 4.0±0.2 | 4.0±0.2 | 1.2 Max. | 3.4±0.2 | 1.0 Typ. | 2.0 Typ. | 1.80 | 1.20 | 3.6 |



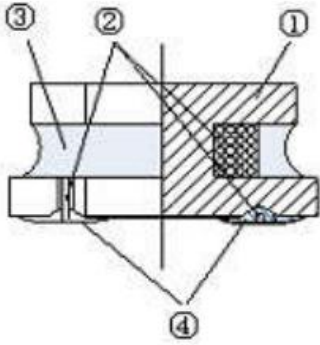
5. Electrical Characteristics

| NO. | Part Number | Inductance | DC Resistance | | Isat(A) | | Irms(A) | | Marking |
|-----|---------------------|------------|---------------|-------|---------|------|---------|------|---------|
| | | 1MHz/0.1V | Max. | Typ. | Max. | Typ. | Max. | Typ. | |
| | Units | (uH) | Ω | Ω | A | A | A | A | |
| 1 | □ SFEK4012A-R47N-HF | 0.47±30% | 0.042 | 0.033 | 6.00 | 7.50 | 4.20 | 5.20 | N/A |
| 2 | □ SFEK4012A-R68N-HF | 0.68±30% | 0.048 | 0.037 | 5.00 | 5.60 | 4.00 | 4.70 | N/A |
| 3 | □ SFEK4012A-1R0N-HF | 1.0±30% | 0.066 | 0.053 | 4.50 | 5.30 | 3.60 | 4.20 | N/A |
| 4 | □ SFEK4012A-1R5N-HF | 1.5±30% | 0.070 | 0.056 | 3.90 | 4.50 | 3.20 | 3.90 | N/A |
| 5 | □ SFEK4012A-2R2M-HF | 2.2±20% | 0.102 | 0.082 | 2.50 | 2.80 | 2.30 | 2.80 | N/A |
| 6 | □ SFEK4012A-3R3M-HF | 3.3±20% | 0.145 | 0.096 | 2.30 | 2.60 | 2.20 | 2.50 | N/A |
| 7 | □ SFEK4012A-4R7M-HF | 4.7±20% | 0.187 | 0.150 | 2.30 | 2.60 | 1.90 | 2.20 | N/A |
| 8 | □ SFEK4012A-6R8M-HF | 6.8±20% | 0.255 | 0.188 | 1.60 | 2.20 | 1.60 | 1.90 | N/A |
| 9 | □ SFEK4012A-100M-HF | 10.0±20% | 0.408 | 0.325 | 1.40 | 1.80 | 1.10 | 1.50 | N/A |
| 10 | □ SFEK4012A-150M-HF | 15.0±20% | 0.632 | 0.506 | 1.20 | 1.60 | 0.90 | 1.25 | N/A |
| 11 | □ SFEK4012A-220M-HF | 22.0±20% | 0.763 | 0.611 | 1.10 | 1.35 | 0.75 | 0.95 | N/A |
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※Design as Customer's Requested Specifications. (可按顾客的特殊需求设计)



6. Structure (The structure of product.)



| NO | Components | Material |
|----|---------------|--|
| ① | Core | soft magnetic metal |
| ② | Wire | Polyurethane system enameled copper wire |
| ③ | Magnetic Glue | Epoxy resin and magnetic powder |
| ④ | Plating | AgNiSn or FeNiCu + Sn Alloy |

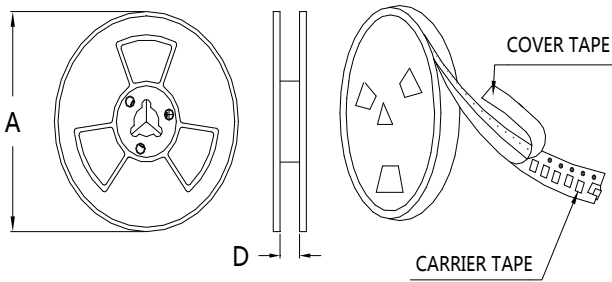
7. PACKAGING(unit: mm)

1.包装类型：编带装

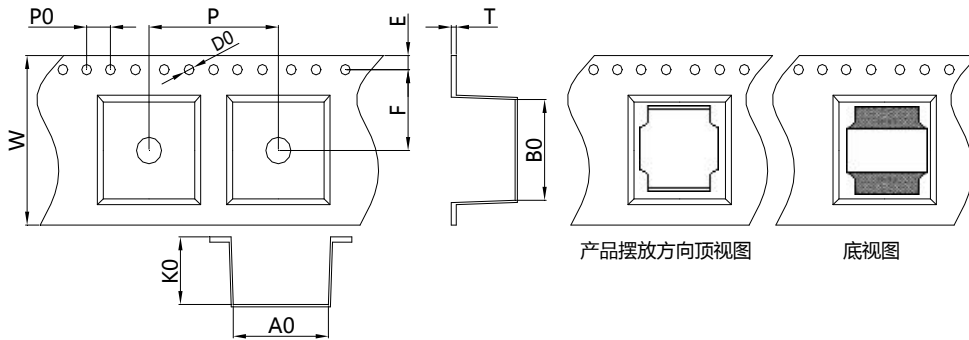
2.包装尺寸：

13" 盘

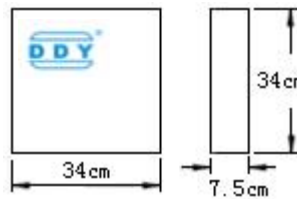
7" 盘



| | 13" 盘 | 7" 盘 |
|---|--------------------|--------------------|
| A | $\Phi 330 \pm 2.0$ | $\Phi 178 \pm 2.0$ |
| D | 12.5 | |



| Item | W | A0 | B0 | K0 | P | T | E | F | D0 | P0 |
|------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|
| (mm) | 12.0 ± 0.3 | 4.4 ± 0.2 | 4.4 ± 0.2 | 1.4 ± 0.1 | 8.0 ± 0.3 | 0.3 ± 0.1 | 1.75 ± 0.1 | 5.5 ± 0.2 | 1.5 ± 0.1 | 4.0 ± 0.2 |

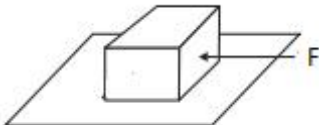


每卷 4500 Pcs

每盒 4卷,共 18000 Pcs

每箱 3盒,共 54000 Pcs



| 8. RELIABILITY TEST | | | |
|---------------------|----------------------------------|--|---|
| No. | TEST ITEM | SPECIFICATION | TEST CONDITION |
| 1 | High temperature Storage test | 1. No significant defects in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta DCR/DCR \leq 10\%$ | Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (N: Follow the product specification for the setting.) Time : 96 ± 2 hours 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. 2. $\Delta L/L \leq 10\%$ 3. $\Delta DCR/DCR \leq 10\%$ | Temperature: $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (M: Follow the product specification for the setting) Time : 96 ± 2 hours Place the samples for one hour at room temperature and test them within two hours. |
| 3 | Humidity test | 1. No significant defects in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta DCR/DCR \leq 10\%$ | Temperature: $40 \pm 2^{\circ}\text{C}$, Humidity: $93 \pm 3\% \text{RH}$ Time : 96 ± 2 hours 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. 2. Solder: lead free 3. Flux: rosin flux |
| 5 | Heat endurance of flow soldering | 1. No significant defects in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta DCR/DCR \leq 10\%$ | 1. Refer to the above reflow curve and go through the reflow for twice. 2. The peak temperature : $260 + 0 / - 5^{\circ}\text{C}$ |
| 6 | Vibration test | 1. No significant defects in appearance. 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 test | 1. Applied force: 10N Duration: 10sec 2. Solder paste thickness: 0.12mm 3. Meet the above requirements without any loose termina | Solder the test samples to the PCB through 245°C reflow, apply a standard force on the side of the test samples for 10 seconds.  |



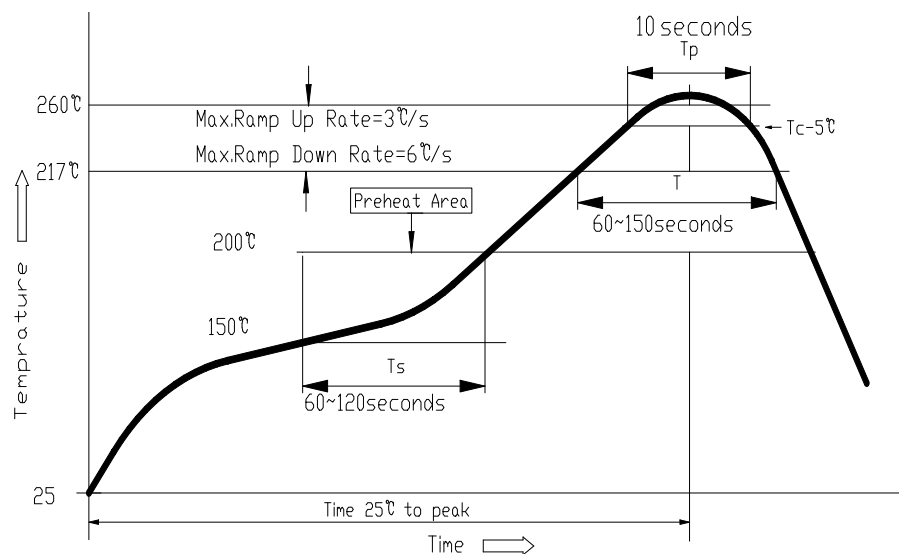
9. SOLDERING CONDITIONS

Applicable soldering process to the products is refl.

9.1 Soldering Materials

- (1) Solder: Sn-3.0Ag-0.5Cu
- (2) Flux: Use rosin-based flux, but not strongly acidic flux (with xhlorine exceeding 0.2wt%). Do not use water-soluble flux.

9.2 Reflow Soldering Profile



9.3 Soldering Iron

Reworking with electric soldering iron must preheating at 150°C for 1 minute is required, and do not directly touch the core with the tip of the soldering iron. The reworking soldering conditions are as follows.

- ① Temperature of soldering iron tip: 350°C;
- ② Soldering iron power output: $\leq 30W$;
- ③ Diameter of soldering iron end: $\leq 1.0mm$;
- ④ Soldering time: $< 3s$



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