

承 認 書

SPECIFICATION FOR APPROVAL

Customer Name: 2144

Description Part No.: _____

Customer Part No.: _____

Sample No.: _____

DDY Part No.: SFE6045A-

| DRAWING | | |
|------------------|---------|----------|
| MADE | CHECKED | APPROVED |
| 王海玲 | 赵万虎 | 肖中华 |
| DATE: 2023年5月12日 | | |

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



惠 州 市 德 立 电 子 有 限 公 司

HUI ZHOU DE LI ELECTRONICS CO., LTD

廣 東 省 博 羅 縣 洲 際 工 業 園 梅 園 三 路

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1. Scope

This specification applies to the SFE6045 Series of wire wound SMD power inductor.

2. PRODUCT IDENTIFICATION

SFE 6045 □ - 1R5 □ - □

(1) (2) (3) (4) (5) (6) (7)

(1) .Series name (产品品名) (2) .Dimensions (产品尺寸)

(3) .Appearance shape (产品形状) (4) .Inductance value (电感值)

A: dodecagon (十二边形); B: octagon (八边形) 1R5: 1.5 μ H 221: 220 μ H

(5) Tolerance (误差值) (6) .Identification code (标识码)

M: $\pm 20\%$; N: $\pm 30\%$

(7) .Environmental status (环保状态)

LF- Lead free; HF-Halogen free; FP-Free red phosphor.

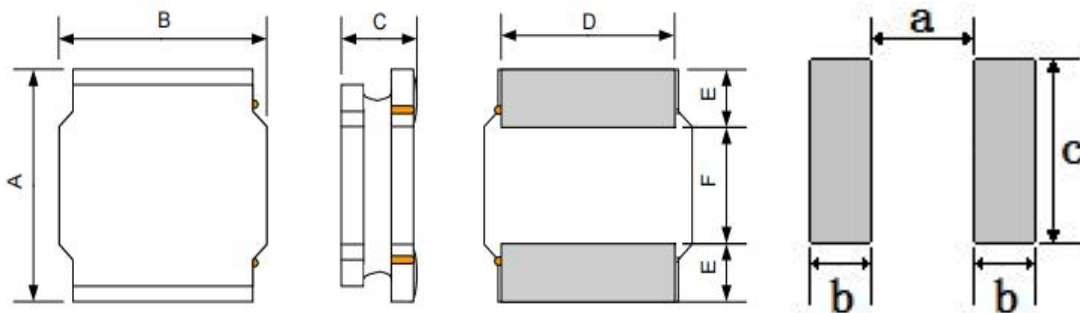
3. Electrical Characteristics

Please refer to Item 5.

- 1). Operating temperature range (individual chip without packing): $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$.
- 2). Storage temperature range (packaging conditions): $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ and RH 70% (Max.).
- 3). Rating DC current: Temperature rise(ΔT) is 40°C approximately at Irms.
- 4). Saturation DC current: Inductance drop approximately 30% of L_0 at Isat.

4. Shape and Dimensions (Unit:mm)

shape: A



Recommended Land Pattern

| Series | A | B | C | D | E | F | a Typ. | b Typ. | c Typ. |
|----------|---------------|---------------|----------|---------------|-----------|----------|--------|--------|--------|
| SFE6045A | 6.0 \pm 0.3 | 6.0 \pm 0.3 | 4.5 Max. | 4.9 \pm 0.3 | 1.65 Typ. | 2.2 Typ. | 2.0 | 2.1 | 5.1 |



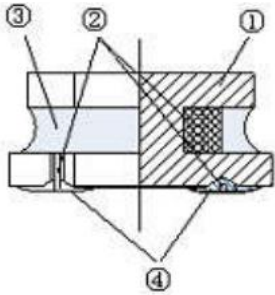
5. Electrical Characteristics

| NO | DDY CODE | Part Number | Inductance | DC Resistance | | Isat(A) | | Irms(A) | | Marking |
|----|----------|---|-------------|---------------|----------|---------|-------|---------|------|---------|
| | | | 100KHz/1.0V | Max. | Typ. | Max. | Typ. | Max. | Typ. | |
| | | | Units | Ω | Ω | A | A | A | A | |
| 1 | | <input type="checkbox"/> SFE6045A-R47N-F-HF | 0.47±30% | 0.011 | 0.009 | 15.00 | 16.50 | 6.50 | 6.50 | R47 |
| 2 | | <input type="checkbox"/> SFE6045A-R56N-F-HF | 0.56±30% | 0.011 | 0.009 | 14.00 | 15.00 | 6.30 | 6.30 | R56 |
| 3 | | <input type="checkbox"/> SFE6045A-1R0N-F-HF | 1.0±30% | 0.014 | 0.011 | 9.50 | 10.00 | 5.50 | 6.00 | 1R0 |
| 4 | | <input type="checkbox"/> SFE6045A-1R2N-F-HF | 1.2±30% | 0.016 | 0.013 | 9.00 | 9.50 | 5.00 | 5.40 | 1R2 |
| 5 | | <input type="checkbox"/> SFE6045A-1R5N-F-HF | 1.5±30% | 0.016 | 0.013 | 8.80 | 9.50 | 4.95 | 5.40 | 1R5 |
| 6 | | <input type="checkbox"/> SFE6045A-2R2M-F-HF | 2.2±20% | 0.023 | 0.018 | 6.75 | 7.40 | 4.60 | 5.00 | 2R2 |
| 7 | | <input type="checkbox"/> SFE6045A-3R3M-F-HF | 3.3±20% | 0.027 | 0.022 | 5.90 | 6.20 | 3.70 | 4.00 | 3R3 |
| 8 | | <input type="checkbox"/> SFE6045A-4R7M-F-HF | 4.7±20% | 0.034 | 0.027 | 4.97 | 5.50 | 3.30 | 3.60 | 4R7 |
| 9 | | <input type="checkbox"/> SFE6045A-5R6M-F-HF | 5.6±20% | 0.038 | 0.032 | 4.15 | 4.60 | 3.15 | 3.40 | 5R6 |
| 10 | | <input type="checkbox"/> SFE6045A-6R2M-F-HF | 6.2±20% | 0.040 | 0.035 | 4.00 | 4.30 | 3.00 | 3.30 | 6R2 |
| 11 | | <input type="checkbox"/> SFE6045A-6R8M-F-HF | 6.8±20% | 0.040 | 0.035 | 3.90 | 4.30 | 3.00 | 3.30 | 6R8 |
| 12 | | <input type="checkbox"/> SFE6045A-8R2M-F-HF | 8.2±20% | 0.060 | 0.053 | 3.90 | 4.30 | 2.60 | 2.80 | 8R2 |
| 13 | | <input type="checkbox"/> SFE6045A-100M-F-HF | 10.0±20% | 0.062 | 0.051 | 3.20 | 3.50 | 2.45 | 2.70 | 100 |
| 14 | | <input type="checkbox"/> SFE6045A-120M-F-HF | 12.0±20% | 0.075 | 0.063 | 2.80 | 3.00 | 2.20 | 2.40 | 120 |
| 15 | | <input type="checkbox"/> SFE6045A-150M-F-HF | 15.0±20% | 0.088 | 0.073 | 2.50 | 2.70 | 2.05 | 2.20 | 150 |
| 16 | | <input type="checkbox"/> SFE6045A-180M-F-HF | 18.0±20% | 0.105 | 0.089 | 2.20 | 2.40 | 1.85 | 2.00 | 180 |
| 17 | | <input type="checkbox"/> SFE6045A-220M-F-HF | 22.0±20% | 0.116 | 0.095 | 2.05 | 2.20 | 1.80 | 2.00 | 220 |
| 18 | | <input type="checkbox"/> SFE6045A-270M-F-HF | 27.0±20% | 0.133 | 0.114 | 1.90 | 2.10 | 1.65 | 1.80 | 270 |
| 19 | | <input type="checkbox"/> SFE6045A-300M-F-HF | 30.0±20% | 0.172 | 0.141 | 1.70 | 1.80 | 1.50 | 1.60 | 300 |
| 20 | | <input type="checkbox"/> SFE6045A-330M-F-HF | 33.0±20% | 0.178 | 0.147 | 1.75 | 2.00 | 1.45 | 1.70 | 330 |
| 21 | | <input type="checkbox"/> SFE6045A-470M-F-HF | 47.0±20% | 0.260 | 0.230 | 1.40 | 1.50 | 1.30 | 1.40 | 470 |
| 22 | | <input type="checkbox"/> SFE6045A-560M-F-HF | 56.0±20% | 0.287 | 0.254 | 1.30 | 1.40 | 1.10 | 1.20 | 560 |
| 23 | | <input type="checkbox"/> SFE6045A-680M-F-HF | 68.0±20% | 0.376 | 0.340 | 1.20 | 1.30 | 1.00 | 1.10 | 680 |
| 24 | | <input type="checkbox"/> SFE6045A-820M-F-HF | 82.0±20% | 0.500 | 0.430 | 1.00 | 1.10 | 1.00 | 1.10 | 820 |
| 25 | | <input type="checkbox"/> SFE6045A-101M-F-HF | 100.0±20% | 0.563 | 0.510 | 0.95 | 1.00 | 0.80 | 0.88 | 101 |
| 26 | | <input type="checkbox"/> SFE6045A-151M-F-HF | 150.0±20% | 0.754 | 0.690 | 0.80 | 0.88 | 0.70 | 0.77 | 151 |
| 27 | | <input type="checkbox"/> SFE6045A-221M-F-HF | 220.0±20% | 1.084 | 0.900 | 0.70 | 0.75 | 0.57 | 0.60 | 221 |
| 28 | | <input type="checkbox"/> SFE6045A-331M-F-HF | 330.0±20% | 1.651 | 1.530 | 0.57 | 0.60 | 0.55 | 0.57 | 331 |
| 29 | | <input type="checkbox"/> SFE6045A-471M-F-HF | 470.0±20% | 2.340 | 2.150 | 0.45 | 0.48 | 0.40 | 0.42 | 471 |
| 30 | | <input type="checkbox"/> SFE6045A-561M-F-HF | 560.0±20% | 3.250 | 2.750 | 0.42 | 0.46 | 0.42 | 0.42 | 561 |
| 31 | | <input type="checkbox"/> SFE6045A-681M-F-HF | 680.0±20% | 3.250 | 2.750 | 0.40 | 0.42 | 0.33 | 0.35 | 681 |
| 32 | | <input type="checkbox"/> SFE6045A-821M-F-HF | 820.0±20% | 5.560 | 4.450 | 0.36 | 0.40 | 0.33 | 0.35 | 821 |
| 33 | | <input type="checkbox"/> SFE6045A-102M-F-HF | 1000.0±20% | 5.850 | 5.120 | 0.30 | 0.35 | 0.30 | 0.35 | 102 |

※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 | Ni-Zn Ferrite |
| ② | Wire | Polyurethane system enameled copper wire |
| ③ | Magnetic Glue | Epoxy resin and magnetic powder |
| ④ | Plating | AgNiSn or FeNiCu + Sn Alloy |

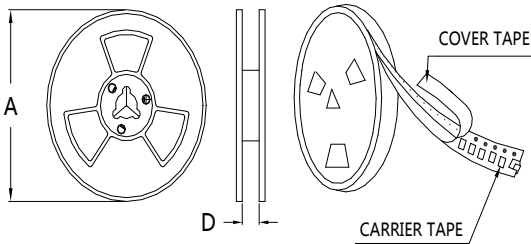
7. PACKAGING(unit: mm)

1.包装类型：编带装

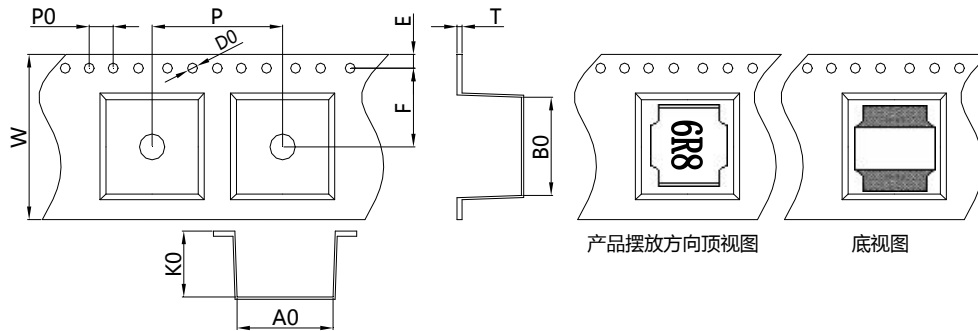
2.包装尺寸：

13" 盘

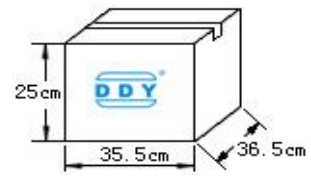
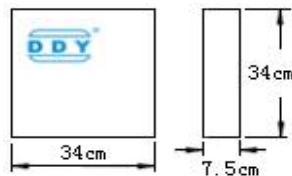
7" 盘



| | 13" 盘 | 7" 盘 |
|---|--------------------|--------------------|
| A | $\Phi 330 \pm 2.0$ | $\Phi 178 \pm 2.0$ |
| D | 12.5/16.5 | |



| Size | Item | W | A0 | B0 | K0 | P | T | E | F | D0 | P0 |
|------|-----------|----------|----------|----------|---------|---------|---------|----------|---------|---------|---------|
| √ | 6045 (mm) | 12.0±0.3 | 6.5±0.15 | 6.5±0.15 | 4.7±0.2 | 8.0±0.3 | 0.4±0.1 | 1.75±0.1 | 5.5±0.1 | 1.5±0.1 | 4.0±0.1 |
| | 6045 (mm) | 16.0±0.3 | 6.5±0.15 | 6.5±0.15 | 4.7±0.2 | 8.0±0.3 | 0.4±0.1 | 1.75±0.1 | 7.5±0.1 | 1.5±0.1 | 4.0±0.1 |



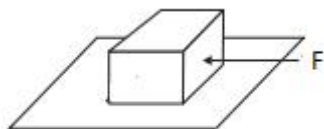
| | | |
|----|------|-----|
| 每卷 | 1500 | Pcs |
|----|------|-----|

| | | | |
|----|------|------|-----|
| 每盒 | 4卷,共 | 6000 | Pcs |
|----|------|------|-----|

| | | | |
|----|------|-------|-----|
| 每箱 | 3盒,共 | 18000 | 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

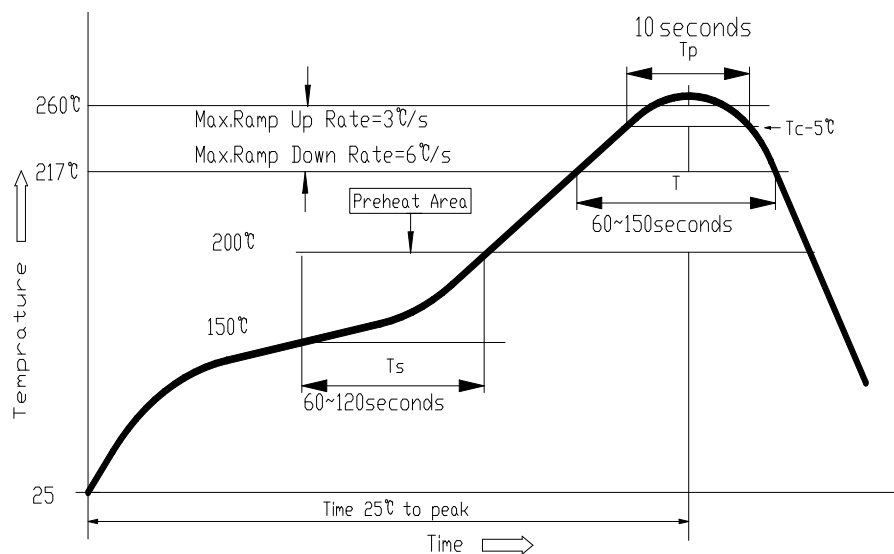
Applicable soldering process to the products is refl.

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: ≤30W;
- ③ Diameter of soldering iron end: ≤1.0mm;
- ④ Soldering time: <3 s



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