

承 認 書

SPECIFICATION FOR APPROVAL

Customer Name: 2144

Description Part No.: _____

Customer Part No.: _____

Sample No.: _____

DDY Part No.: SFE201610-

| DRAWING | | |
|------------------|---------|----------|
| MADE | CHECKED | APPROVED |
| 王海玲 | 赵万虎 | 肖中华 |
| DATE: 2023年5月22日 | | |

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



惠 州 市 德 立 电 子 有 限 公 司

HUI ZHOU DE LI ELECTRONICS CO., LTD

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1. Scope

This specification applies to the SFE201610 Series of wire wound SMD power inductor.

2. PRODUCT IDENTIFICATION

SFE 201610 - 1R5 □ - □
(1) (2) (3) (4) (5)

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

(3) .Inductance value (电感值) (4) .Tolerance (误差值)

1R5: 1.5 μ H 221: 220 μ H

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

(5) .Environmental status (环保状态)

LF- Lead free; HF-Halogen free.

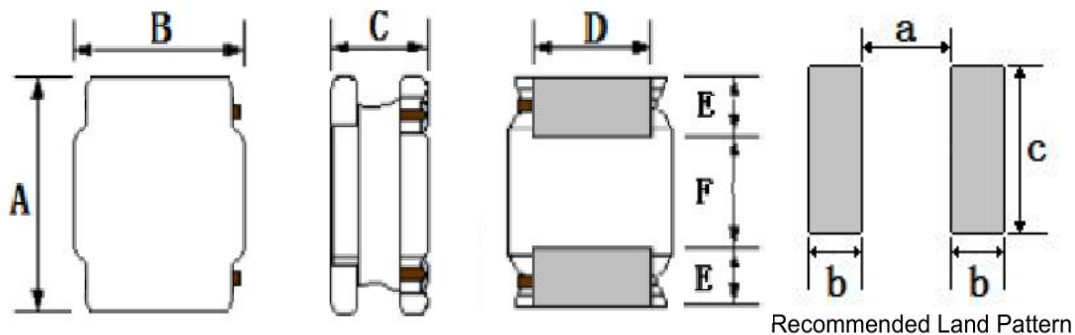
FP-Free red phosphor.

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 I_{rms} .
- 4). Saturation DC current: Inductance drop approximately 30% of L_0 at I_{sat} .

4. Shape and Dimensions (Unit:mm)



| NO | Series | A | B | C | D | E | F | a Typ. | b Typ. | c Typ. |
|----|-----------|---------------|---------------|----------|---------------|----------|----------|--------|--------|--------|
| 1 | SFE201610 | 2.0 \pm 0.3 | 1.6 \pm 0.3 | 1.05 Max | 1.2 \pm 0.2 | 0.6 Typ. | 0.8 Typ. | 0.60 | 0.80 | 1.40 |



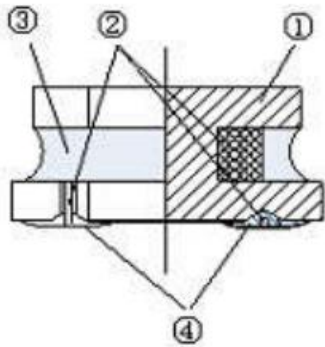
5. Electrical Characteristics

| NO | Part Number | Inductance | DC Resistance | | Isat(A) | | Irms(A) | | Marking |
|----|--|-------------|---------------|-------|---------|------|---------|------|---------|
| | | 100KHz/1.0V | Max. | Typ. | Max. | Typ. | Max. | Typ. | |
| | Units | (uH) | Ω | Ω | A | A | A | A | |
| 1 | <input type="checkbox"/> SFE201610-R22N-HF | 0.22±30% | 0.040 | 0.033 | 3.70 | 4.10 | 2.80 | 3.10 | N/A |
| 2 | <input type="checkbox"/> SFE201610-R24N-HF | 0.24±30% | 0.040 | 0.033 | 3.70 | 4.10 | 2.80 | 3.10 | N/A |
| 3 | <input type="checkbox"/> SFE201610-R33N-HF | 0.33±30% | 0.048 | 0.043 | 3.00 | 3.70 | 2.40 | 2.90 | N/A |
| 4 | <input type="checkbox"/> SFE201610-R47N-HF | 0.47±30% | 0.060 | 0.052 | 2.30 | 2.80 | 2.30 | 2.60 | N/A |
| 5 | <input type="checkbox"/> SFE201610-R68N-HF | 0.68±30% | 0.076 | 0.068 | 1.95 | 2.45 | 2.00 | 2.20 | N/A |
| 6 | <input type="checkbox"/> SFE201610-1R0N-HF | 1.0±30% | 0.114 | 0.104 | 1.65 | 1.85 | 1.45 | 1.60 | N/A |
| 7 | <input type="checkbox"/> SFE201610-1R5N-HF | 1.5±30% | 0.174 | 0.164 | 1.35 | 1.65 | 1.10 | 1.20 | N/A |
| 8 | <input type="checkbox"/> SFE201610-2R2M-HF | 2.2±20% | 0.265 | 0.232 | 1.20 | 1.45 | 1.05 | 1.15 | N/A |
| 9 | <input type="checkbox"/> SFE201610-3R3M-HF | 3.3±20% | 0.345 | 0.328 | 1.00 | 1.20 | 0.85 | 0.95 | N/A |
| 10 | <input type="checkbox"/> SFE201610-4R7M-HF | 4.7±20% | 0.480 | 0.430 | 0.75 | 0.90 | 0.70 | 0.80 | N/A |
| 11 | <input type="checkbox"/> SFE201610-6R8M-HF | 6.8±20% | 0.800 | 0.715 | 0.70 | 0.85 | 0.55 | 0.60 | N/A |
| 12 | <input type="checkbox"/> SFE201610-8R2M-HF | 8.2±20% | 0.940 | 0.818 | 0.68 | 0.78 | 0.53 | 0.60 | N/A |
| 13 | <input type="checkbox"/> SFE201610-100M-HF | 10±20% | 1.000 | 0.930 | 0.65 | 0.70 | 0.50 | 0.60 | 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 | 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 |

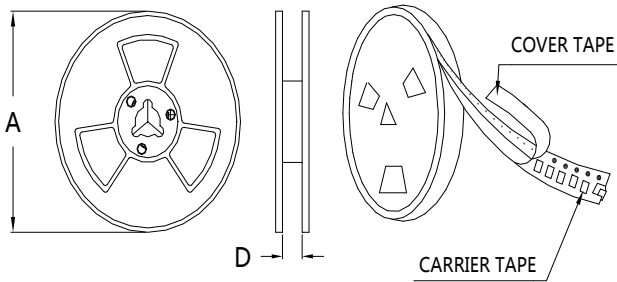
7. PACKAGING(unit: mm)

1.包装类型：编带装

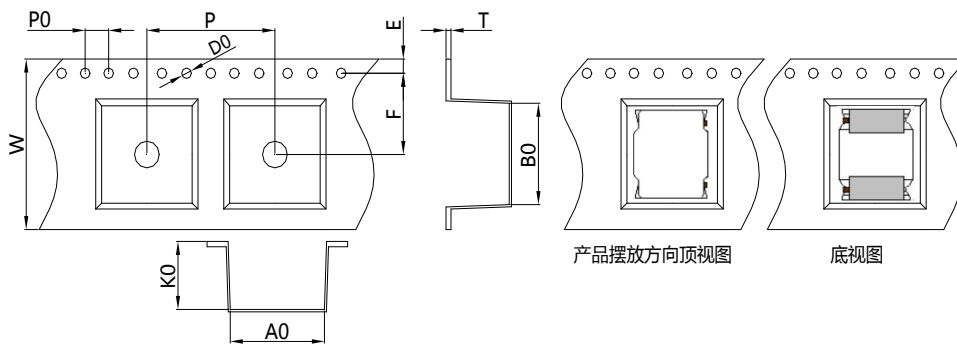
2.包装尺寸：

13" 盘

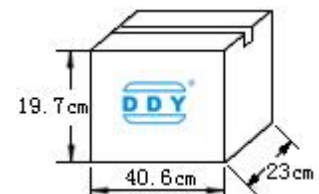
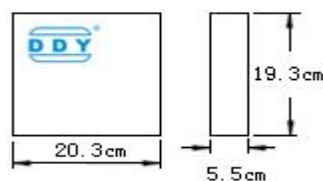
7" 盘



| | 13" 盘 | 7" 盘 |
|---|--------------------|--------------------|
| A | $\Phi 330 \pm 2.0$ | $\Phi 178 \pm 2.0$ |
| D | 8.5 | |



| Size | Item | W | A0 | B0 | K0 | P | T | E | F | D0 | P0 |
|------|------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|---------------|---------------|---------------|
| 2016 | (mm) | 8.0 ± 0.1 | 1.9 ± 0.1 | 2.2 ± 0.1 | 1.2 ± 0.1 | 4.0 ± 0.1 | 0.25 ± 0.1 | 1.75 ± 0.1 | 3.5 ± 0.1 | 1.5 ± 0.1 | 4.0 ± 0.1 |



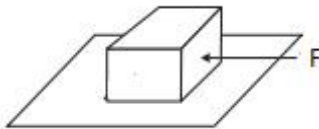
每卷 2000 Pcs

每盒 4卷,共 8000 Pcs

每箱 6盒,共 48000 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 $10 \sim 55 \sim 10 \text{Hz}$ 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

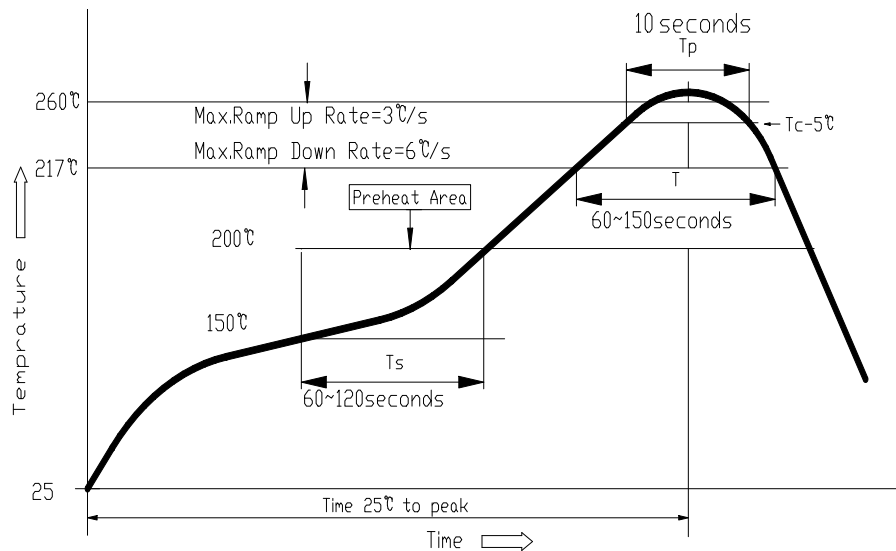
Applicable soldering process to the products is refl.

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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