

# 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

廣東省博羅縣洲際工業園梅園三路

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Http: [www.ddycoils.com](http://www.ddycoils.com)

[illegible]

**\* Special notes:**  
**This product is non-vehicle certified.**



## 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: 1.5μH 221: 220μH

M: ±20%; N: ±30%

(5) .Environmental status (环保状态)

LF- Lead free; HF-Halogen free.

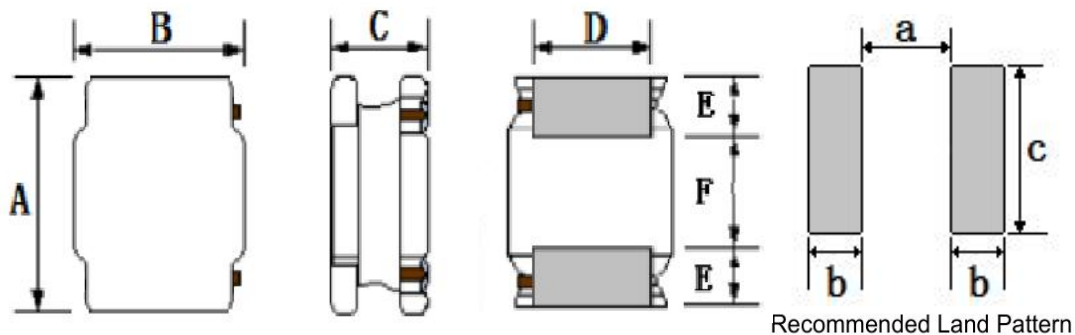
FP-Free red phosphor.

## 3. Electrical Characteristics

Please refer to Item 5.

- 1). Operating temperature range (individual chip without packing): -40℃ ~ +125℃ .
- 2). Storage temperature range (packaging conditions): -40℃ ~ +85℃ and RH 70% (Max.).
- 3). Rating DC current: Temperature rise( $\Delta T$ ) is 40℃ approximately at Irms.
- 4). Saturation DC current: Inductance drop approximately 30% of  $L_0$  at Isat.

## 4. Shape and Dimensions (Unit:mm)



| NO | Series    | A       | B       | C        | D       | E        | F        | a Typ. | b Typ. | c Typ. |
|----|-----------|---------|---------|----------|---------|----------|----------|--------|--------|--------|
| 1  | SFE201610 | 2.0±0.3 | 1.6±0.3 | 1.05 Max | 1.2±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)        | $\Omega$      | $\Omega$ | 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     |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |
|    |                                            |             |               |          |         |      |         |      |         |

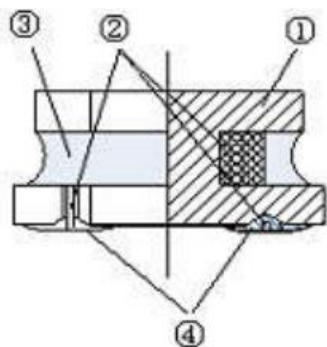
※Design as Customer's Requested Specifications. (可按顾客的特殊需求设计)



# 惠州市德立电子有限公司

## HUI ZHOU DE LI ELECTRONICS CO., LTD

### 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              |

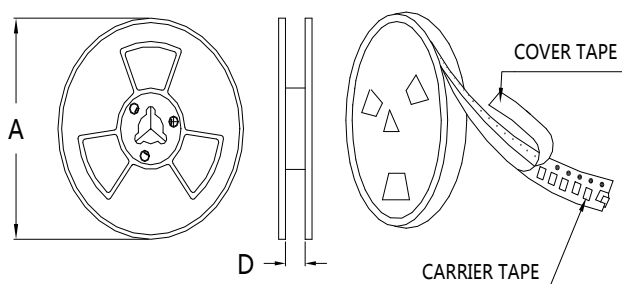
### 7. PACKAGING(unit: mm)

1.包装类型：编带装

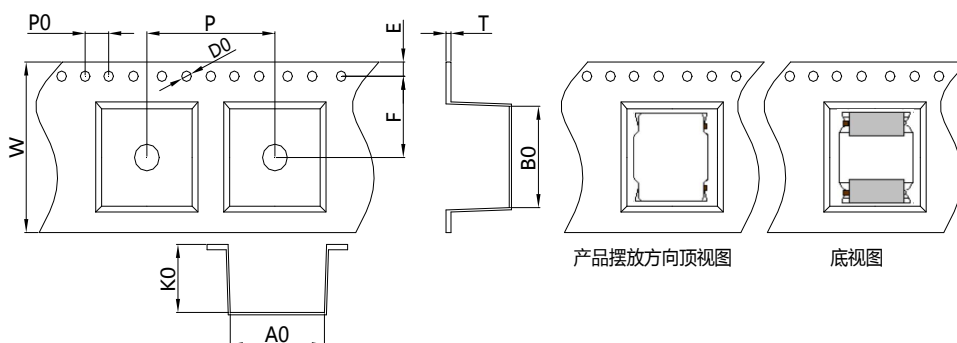
2.包装尺寸：

☐ 13" 盘

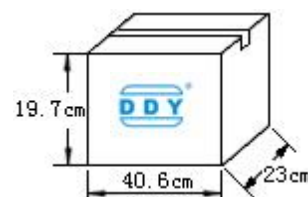
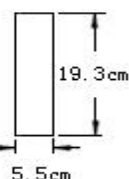
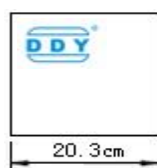
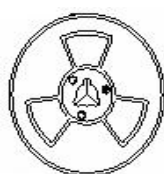
☒ 7" 盘



|   | 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) | $8.0 \pm 0.1$ | $1.9 \pm 0.1$ | $2.2 \pm 0.1$ | $1.2 \pm 0.1$ | $4.0 \pm 0.1$ | $0.25 \pm 0.1$ | $1.75 \pm 0.1$ | $3.5 \pm 0.1$ | $1.5 \pm 0.1$ | $4.0 \pm 0.1$ |



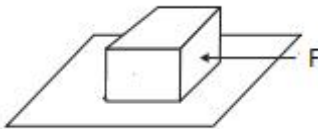
|    |      |     |
|----|------|-----|
| 每卷 | 2000 | Pcs |
|----|------|-----|

|    |      |      |     |
|----|------|------|-----|
| 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.<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 : $260 + 0/-5^{\circ}\text{C}$                                                                                                       |
| 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 test      | 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> |



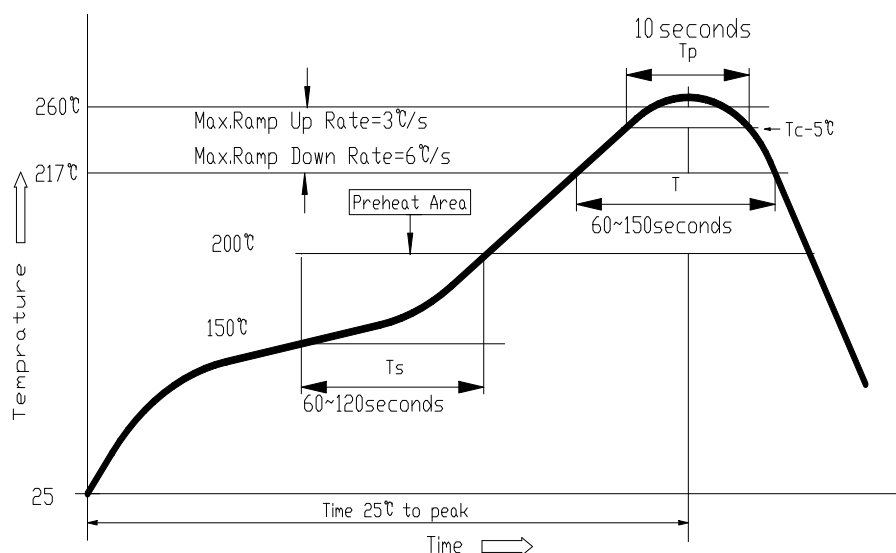
## 9. SOLDERING CONDITIONS

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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