

# 承 認 書

## SPECIFICATION FOR APPROVAL

Customer Name: 2144

Description Part No.: \_\_\_\_\_

Customer Part No.: \_\_\_\_\_

Sample No.: \_\_\_\_\_

DDY Part No.: SFE6028A-

| DRAWING          |         |          |
|------------------|---------|----------|
| MADE             | CHECKED | APPROVED |
| 王海玲              | 赵万虎     | 肖中华      |
| DATE: 2023年5月21日 |         |          |

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



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## 1. Scope

This specification applies to the SFE6028 Series of wire wound SMD power inductor.

## 2. PRODUCT IDENTIFICATION

SFE 6028 □ - 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 $\mu$ H 221: 220 $\mu$ 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.

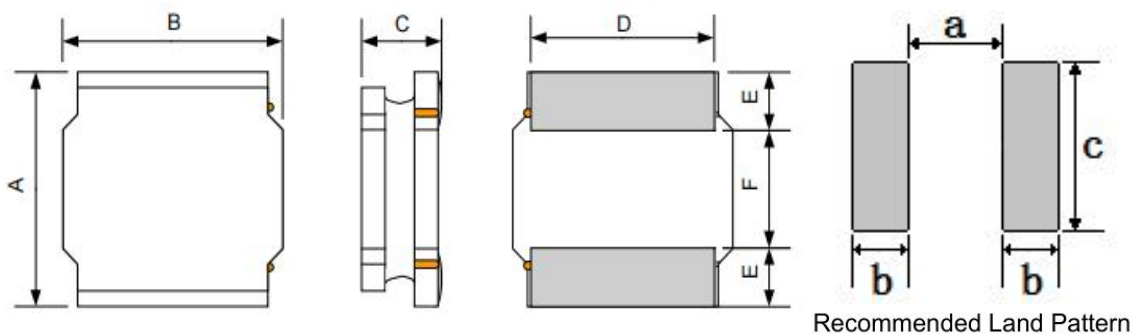
## 3. Electrical Characteristics

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( $\Delta T$ ) is  $40^{\circ}\text{C}$  approximately at Irms.
- 4). Saturation DC current: Inductance drop approximately 30% of  $L_0$  at Isat.

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

shape: A



| Series   | A             | B             | C        | D             | E        | F       | a Typ. | b Typ. | c Typ. |
|----------|---------------|---------------|----------|---------------|----------|---------|--------|--------|--------|
| SFE6028A | 6.0 $\pm$ 0.3 | 6.0 $\pm$ 0.3 | 2.8 Max. | 4.9 $\pm$ 0.3 | 1.9 Typ. | 2.2 Typ | 2.0    | 2.1    | 5.1    |

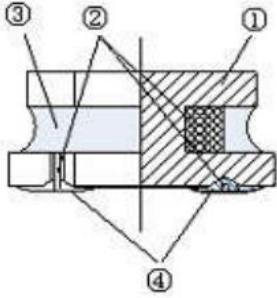


### 5. Electrical Characteristics

| NO. | DDY CODE | Part Number                                 | Inductance       | DC Resistance |          | Isat(A) |      | Irms(A) |      | Marking |
|-----|----------|---|------------------|---------------|----------|---------|------|---------|------|---------|
|     |          |   | 100KHz/1.0V      | Max.          | Typ.     | Max.    | Typ. | Max.    | Typ. |         |
|     |          | Units                                       | ( $\mu$ H)       | $\Omega$      | $\Omega$ | A       | A    | A       | A    |         |
| 1   |          | <input type="checkbox"/> SFE6028A-1R0N-F-HF | 1.0 $\pm$ 30%    | 0.016         | 0.012    | 7.00    | 8.00 | 5.20    | 5.70 | 1R0     |
| 2   |          | <input type="checkbox"/> SFE6028A-1R2N-F-HF | 1.2 $\pm$ 30%    | 0.017         | 0.015    | 6.40    | 7.50 | 4.58    | 5.00 | 1R2     |
| 3   |          | <input type="checkbox"/> SFE6028A-1R5N-F-HF | 1.5 $\pm$ 30%    | 0.017         | 0.015    | 6.00    | 6.60 | 4.58    | 5.00 | 1R5     |
| 4   |          | <input type="checkbox"/> SFE6028A-2R2M-F-HF | 2.2 $\pm$ 20%    | 0.026         | 0.020    | 5.10    | 5.60 | 4.00    | 4.10 | 2R2     |
| 5   |          | <input type="checkbox"/> SFE6028A-2R7M-F-HF | 2.7 $\pm$ 20%    | 0.033         | 0.028    | 4.15    | 4.15 | 3.75    | 4.10 | 2R7     |
| 6   |          | <input type="checkbox"/> SFE6028A-3R3M-F-HF | 3.3 $\pm$ 20%    | 0.033         | 0.028    | 4.15    | 4.50 | 3.50    | 3.80 | 3R3     |
| 7   |          | <input type="checkbox"/> SFE6028A-4R7M-F-HF | 4.7 $\pm$ 20%    | 0.039         | 0.032    | 3.00    | 3.30 | 3.08    | 3.40 | 4R7     |
| 8   |          | <input type="checkbox"/> SFE6028A-5R6M-F-HF | 5.6 $\pm$ 20%    | 0.061         | 0.051    | 3.20    | 3.50 | 2.60    | 2.80 | 5R6     |
| 9   |          | <input type="checkbox"/> SFE6028A-6R8M-F-HF | 6.8 $\pm$ 20%    | 0.061         | 0.051    | 2.60    | 3.00 | 2.40    | 2.60 | 6R8     |
| 10  |          | <input type="checkbox"/> SFE6028A-8R2M-F-HF | 8.2 $\pm$ 20%    | 0.072         | 0.062    | 2.30    | 2.70 | 2.25    | 2.50 | 8R2     |
| 11  |          | <input type="checkbox"/> SFE6028A-100M-F-HF | 10.0 $\pm$ 20%   | 0.094         | 0.073    | 2.20    | 2.40 | 2.00    | 2.40 | 100     |
| 12  |          | <input type="checkbox"/> SFE6028A-150M-F-HF | 15.0 $\pm$ 20%   | 0.163         | 0.130    | 1.75    | 1.90 | 1.45    | 1.60 | 150     |
| 13  |          | <input type="checkbox"/> SFE6028A-180M-F-HF | 18.0 $\pm$ 20%   | 0.172         | 0.141    | 1.52    | 0.80 | 1.45    | 1.60 | 180     |
| 14  |          | <input type="checkbox"/> SFE6028A-220M-F-HF | 22.0 $\pm$ 20%   | 0.182         | 0.153    | 1.45    | 1.80 | 1.40    | 1.60 | 220     |
| 15  |          | <input type="checkbox"/> SFE6028A-330M-F-HF | 33.0 $\pm$ 20%   | 0.241         | 0.220    | 1.35    | 1.50 | 1.22    | 1.30 | 330     |
| 16  |          | <input type="checkbox"/> SFE6028A-470M-F-HF | 47.0 $\pm$ 20%   | 0.410         | 0.310    | 1.15    | 1.30 | 1.06    | 1.10 | 470     |
| 17  |          | <input type="checkbox"/> SFE6028A-560M-F-HF | 56.0 $\pm$ 20%   | 0.449         | 0.378    | 1.05    | 1.20 | 0.90    | 1.05 | 560     |
| 18  |          | <input type="checkbox"/> SFE6028A-680M-F-HF | 68.0 $\pm$ 20%   | 0.468         | 0.425    | 0.80    | 0.95 | 0.86    | 0.95 | 680     |
| 19  |          | <input type="checkbox"/> SFE6028A-101M-F-HF | 100.0 $\pm$ 20%  | 0.810         | 0.680    | 0.65    | 0.71 | 0.70    | 0.77 | 101     |
| 20  |          | <input type="checkbox"/> SFE6028A-121M-F-HF | 120.0 $\pm$ 20%  | 1.150         | 0.960    | 0.55    | 0.60 | 0.60    | 0.65 | 121     |
| 21  |          | <input type="checkbox"/> SFE6028A-221M-F-HF | 220.0 $\pm$ 20%  | 1.560         | 1.370    | 0.38    | 0.40 | 0.40    | 0.45 | 221     |
| 22  |          | <input type="checkbox"/> SFE6028A-331M-F-HF | 330.0 $\pm$ 20%  | 2.850         | 2.250    | 0.35    | 0.40 | 0.40    | 0.44 | 331     |
| 23  |          | <input type="checkbox"/> SFE6028A-471M-F-HF | 470.0 $\pm$ 20%  | 3.580         | 3.110    | 0.32    | 0.37 | 0.35    | 0.40 | 471     |
| 24  |          | <input type="checkbox"/> SFE6028A-102M-F-HF | 1000.0 $\pm$ 20% | 7.540         | 5.980    | 0.18    | 0.22 | 0.22    | 0.23 | 102     |
| 25  |          |   |                  |               |          |         |      |         |      |         |



## 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              |

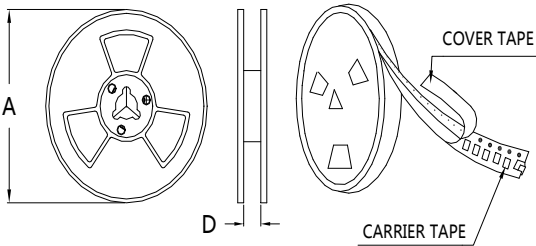
## 7. PACKAGING(unit: mm)

1.包装类型：编带装

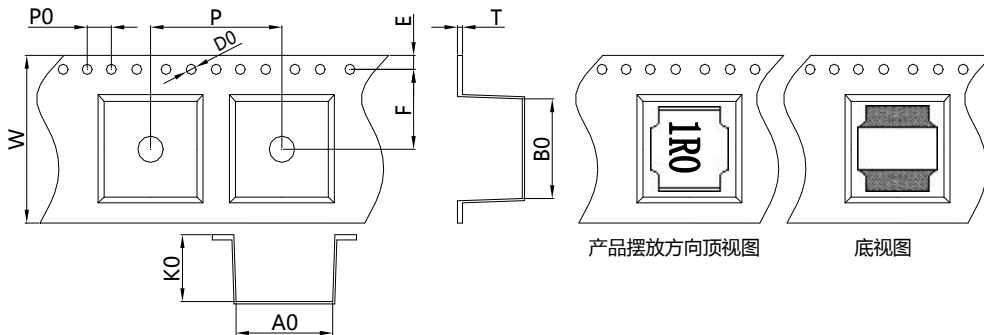
2.包装尺寸：

13" 盘

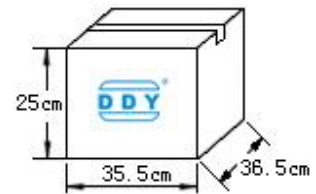
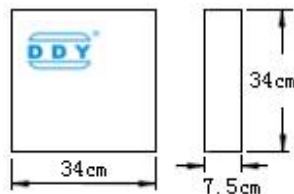
7" 盘



|   | 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      |
|------|-----------|----------|----------|----------|---------|---------|---------|----------|---------|---------|---------|
| √    | 6028 (mm) | 12.0±0.3 | 6.5±0.15 | 6.5±0.15 | 3.0±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 |
|      | 6028 (mm) | 16.0±0.3 | 6.5±0.15 | 6.5±0.15 | 3.0±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 |

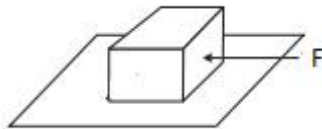


|    |      |     |
|----|------|-----|
| 每卷 | 2000 | Pcs |
|----|------|-----|

|    |      |      |     |
|----|------|------|-----|
| 每盒 | 4卷,共 | 8000 | Pcs |
|----|------|------|-----|

|    |      |       |     |
|----|------|-------|-----|
| 每箱 | 3盒,共 | 24000 | 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

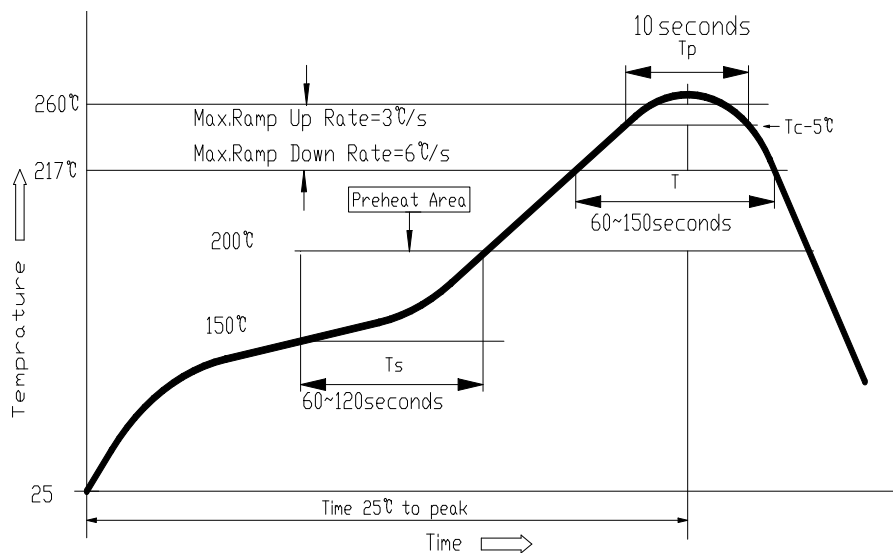
Applicable soldering process to the products is refl.

### 9.1 Soldering Materials

(1) Solder: Sn-3.0Ag-0.5Cu

(2) Flux: Use rosin-based flux, but not strongly acidic flux (with chlorine 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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