

# 承 認 書

## SPECIFICATION FOR APPROVAL

Customer Name: 2144

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

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

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

DDY Part No.: SFEK4020A-

DRAWING		
MADE	CHECKED	APPROVED
王海玲	赵万虎	肖中华
DATE: 2023年9月14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

NO.3 MEI YUAN ROAD,ZHOU JI INDUSTRIAL AREA,BOLUO COUNTY GUANGDONG

電話：15970768093 13640935893

傳真：0752-6207969

郵編：516100

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



惠州市德立电子有限公司

HUI ZHOU DE LI ELECTRONICS CO., LTD

Version of Changed Record

DATE	REV	CHANGED CONTENTS	DRAFT	APPROVED
2023/9/14	A	新版发行	王海玲	肖中华

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



### 1. Scope

This specification applies to the SFEK4020 Series of wire wound SMD power inductor.

### 2. PRODUCT IDENTIFICATION

SFEK 4020 □ - 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)<br>A: dodecagon (十二边形) ; B: octagon (八边形) | (4) .Inductance value (电感值)<br>1R5: 1.5μH 221: 220μH   |
| (5) Tolerance (误差值)<br>M: ±20%; N: ±30%                                | (7) .Environmental status (环保状态)<br>LF- Lead free; HF-Halogen free;<br>FP-Free red phosphor. |

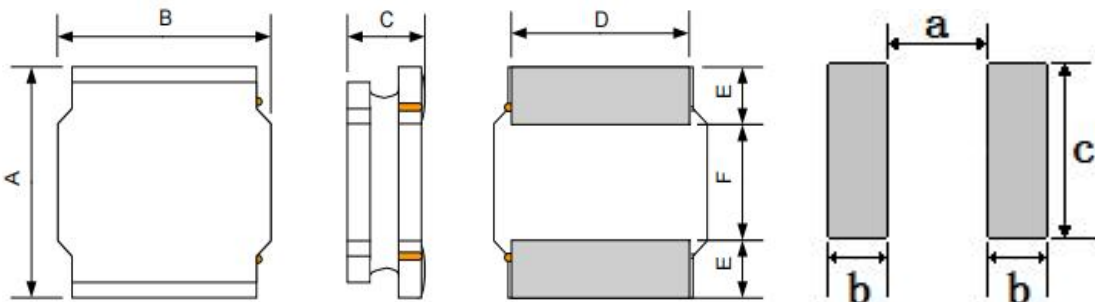
### 3. Electrical Characteristics

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.
SFEK4020A	4.0±0.2	4.0±0.2	2.0 Max.	3.3±0.2	1.0 Typ.	2.0 Ttp.	1.8	1.2	3.5



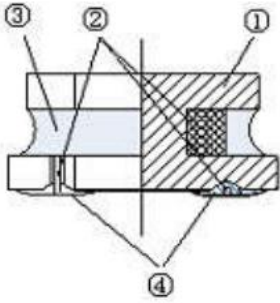
### 5. Electrical Characteristics

NO.	Part Number	Inductance	DC Resistance		Isat(A)		Irms(A)		Marking
		1MHz/0.1V	Max.	Typ.		Typ.	Max.	Typ.	
	Units	(uH)	$\Omega$	$\Omega$	A	A	A	A	
1	<input type="checkbox"/> SFEK4020A-R47N-HF	0.47±30%	0.032	0.021	10.00	12.00	6.40	7.50	N/A
2	<input type="checkbox"/> SFEK4020A-R68N-HF	0.68±30%	0.034	0.026	8.00	9.00	4.30	5.00	N/A
3	<input type="checkbox"/> SFEK4020A-1R0N-HF	1.0±30%	0.039	0.032	7.70	7.70	4.00	4.50	N/A
4	<input type="checkbox"/> SFEK4020A-1R5N-HF	1.5±30%	0.049	0.039	7.00	7.30	3.50	3.70	N/A
5	<input type="checkbox"/> SFEK4020A-2R2M-HF	2.2±20%	0.093	0.073	6.50	7.00	3.00	3.50	N/A
6	<input type="checkbox"/> SFEK4020A-3R3M-HF	3.3±20%	0.117	0.093	5.00	5.50	2.50	3.20	N/A
7	<input type="checkbox"/> SFEK4020A-4R7M-HF	4.7±20%	0.153	0.123	4.50	4.70	2.20	2.50	N/A
8	<input type="checkbox"/> SFEK4020A-6R8M-HF	6.8±20%	0.205	0.169	3.50	4.20	2.00	2.40	N/A
9	<input type="checkbox"/> SFEK4020A-100M-HF	10.0±20%	0.216	0.190	2.80	3.50	2.00	2.35	N/A
10	<input type="checkbox"/> SFEK4020A-150M-HF	15.0±20%	0.460	0.364	2.70	3.30	1.30	1.70	N/A
11	<input type="checkbox"/> SFEK4020A-220M-HF	22.0±20%	0.600	0.505	2.10	2.50	1.20	1.50	N/A

※Design as Customer's Requested Specifications. (可按顾客的特殊需求设计) 4



6. Structure (The structure of product.)



	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

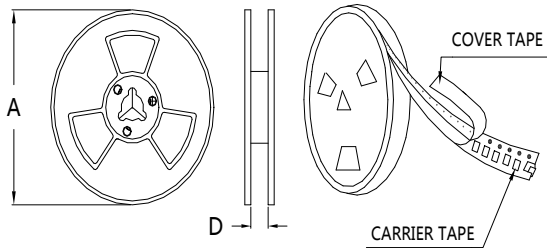
7. PACKAGING(unit: mm)

1.包装类型：编带装

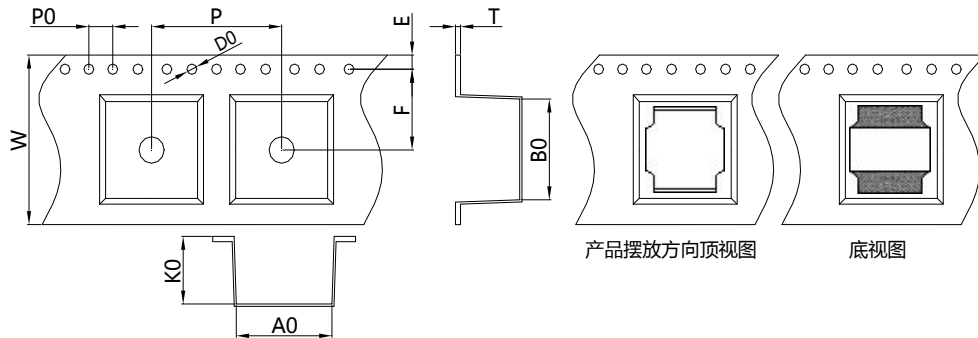
2.包装尺寸：

13" 盘

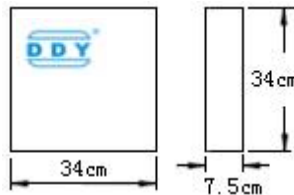
7" 盘



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



Size	Item	W	A0	B0	K0	P	T	E	F	D0	P0
4020	(mm)	$12.0 \pm 0.3$	$4.4 \pm 0.2$	$4.4 \pm 0.2$	$2.1 \pm 0.2$	$8.0 \pm 0.3$	$0.3 \pm 0.1$	$1.75 \pm 0.1$	$5.5 \pm 0.2$	$1.5 \pm 0.1$	$4.0 \pm 0.2$



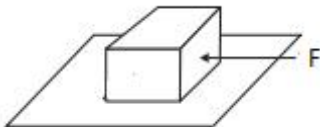
每卷	3000	Pcs
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每盒	4卷,共	12000	Pcs
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每箱	3盒,共	36000	Pcs
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**8. RELIABILITY TEST**

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 : $96 \pm 2$ 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 : $96 \pm 2$ 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 : $96 \pm 2$ 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 $245^{\circ}\text{C}$ reflow, apply a standard force on the side of the test samples for 10 seconds. 



## 9. SOLDERING CONDITIONS

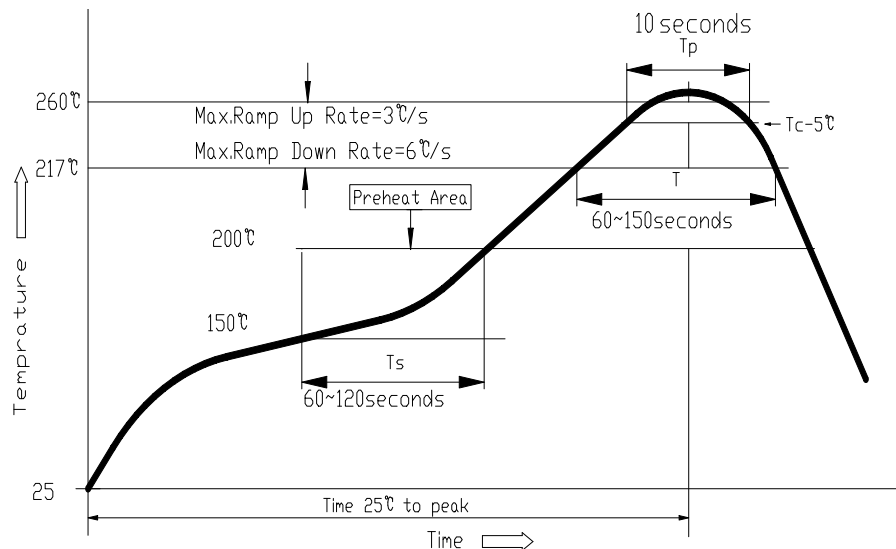
Applicable soldering process to the products is refl.

### 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 SFEK4020A-



### 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:  $< 3 s$



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