

# 承 認 書

## SPECIFICATION FOR APPROVAL

Customer Name: 2144

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

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

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

DDY Part No.: SFE5040B-

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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Version of Changed Record

DATE	REV	CHANGED CONTENTS	DRAFT	APPROVED
2023/5/22	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 SFE5040 Series of wire wound SMD power inductor.

### 2.PRODUCT IDENTIFICATION

SFE 5040 □ - 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: 1.5μH 221: 220μH

(5) Tolerance (误差值)

(6) .Identification code (标识码)

M: ±20%; N: ±30%

(7) .Environmental status (环保状态)

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

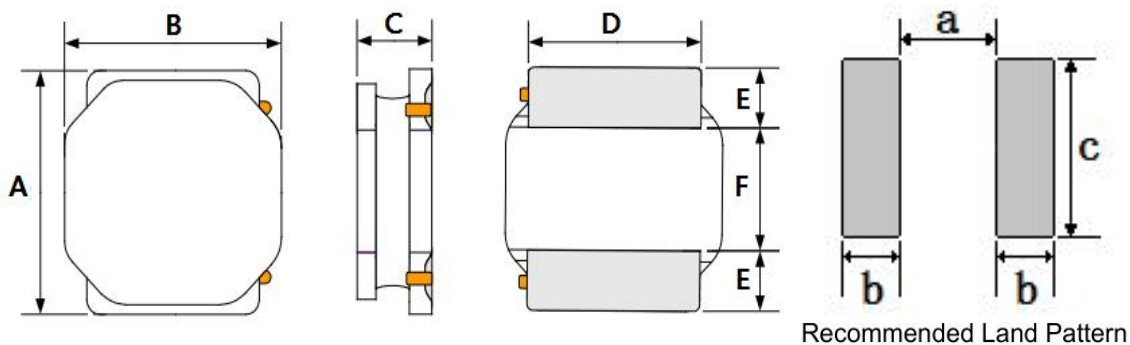
### 3. Electrical Characteristics

Please refer to Item 5.

- 1). Operating temperature range (individual chip without packing): -40°C ~ +125°C .
- 2). Storage temperature range (packaging conditions): -40°C ~ +85°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<sub>0</sub> at Isat.

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

shape: B



Series	A	B	C	D	E	F	a Typ.	b Typ.	c Typ.
SFE5040B	5.0±0.2	5.0±0.2	4.0 Max.	4.0±0.2	1.6 Typ.	1.8 Typ.	1.6	1.8	4.2



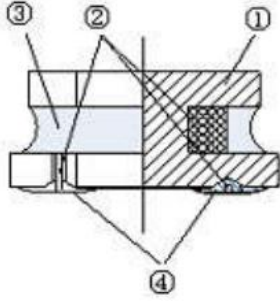
### 5. Electrical Characteristics

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"/> SFE5040B-R47N-F-HF	0.47 $\pm$ 30%	0.013	0.010	10.00	11.50	6.60	7.60	R47
2		<input type="checkbox"/> SFE5040B-1R0N-F-HF	1.00 $\pm$ 30%	0.016	0.014	7.35	8.00	4.90	5.00	1R0
3		<input type="checkbox"/> SFE5040B-1R2N-F-HF	1.20 $\pm$ 30%	0.020	0.016	6.50	7.00	4.30	4.80	1R2
4		<input type="checkbox"/> SFE5040B-1R5N-F-HF	1.50 $\pm$ 30%	0.020	0.016	6.30	6.80	4.30	4.80	1R5
5		<input type="checkbox"/> SFE5040B-1R8N-F-HF	1.80 $\pm$ 30%	0.027	0.021	5.50	6.05	4.15	4.30	1R8
6		<input type="checkbox"/> SFE5040B-2R2M-F-HF	2.20 $\pm$ 20%	0.027	0.021	4.90	5.50	3.80	4.20	2R2
7		<input type="checkbox"/> SFE5040B-2R7M-F-HF	2.70 $\pm$ 20%	0.031	0.025	4.30	4.80	3.60	4.00	2R7
8		<input type="checkbox"/> SFE5040B-3R3M-F-HF	3.30 $\pm$ 20%	0.031	0.025	3.95	4.45	3.40	3.90	3R3
9		<input type="checkbox"/> SFE5040B-3R6M-F-HF	3.60 $\pm$ 20%	0.031	0.025	3.95	4.45	3.40	3.90	3R6
10		<input type="checkbox"/> SFE5040B-3R9M-F-HF	3.90 $\pm$ 20%	0.034	0.029	3.80	4.40	3.30	3.70	3R9
11		<input type="checkbox"/> SFE5040B-4R7M-F-HF	4.70 $\pm$ 20%	0.041	0.032	3.50	3.90	3.00	3.30	4R7
12		<input type="checkbox"/> SFE5040B-5R6M-F-HF	5.60 $\pm$ 20%	0.046	0.040	3.00	3.70	2.80	3.10	5R6
13		<input type="checkbox"/> SFE5040B-6R8M-F-HF	6.80 $\pm$ 20%	0.056	0.045	2.90	3.50	2.50	2.80	6R8
14		<input type="checkbox"/> SFE5040B-8R2M-F-HF	8.20 $\pm$ 20%	0.083	0.069	2.70	3.00	2.30	2.60	8R2
15		<input type="checkbox"/> SFE5040B-100M-F-HF	10.0 $\pm$ 20%	0.083	0.069	2.35	2.90	2.10	2.40	100
16		<input type="checkbox"/> SFE5040B-150M-F-HF	15.0 $\pm$ 20%	0.112	0.096	2.00	2.20	2.00	2.05	150
17		<input type="checkbox"/> SFE5040B-180M-F-HF	18.0 $\pm$ 20%	0.155	0.136	1.70	2.00	1.50	1.65	180
18		<input type="checkbox"/> SFE5040B-220M-F-HF	22.0 $\pm$ 20%	0.168	0.151	1.60	1.90	1.50	1.60	220
19		<input type="checkbox"/> SFE5040B-270M-F-HF	27.0 $\pm$ 20%	0.234	0.180	1.52	1.75	1.40	1.50	270
20		<input type="checkbox"/> SFE5040B-330M-F-HF	33.0 $\pm$ 20%	0.244	0.213	1.30	1.50	1.20	1.40	330
21		<input type="checkbox"/> SFE5040B-470M-F-HF	47.0 $\pm$ 20%	0.354	0.300	1.10	1.30	1.00	1.10	470
22		<input type="checkbox"/> SFE5040B-560M-F-HF	56.0 $\pm$ 20%	0.494	0.385	1.05	1.20	0.90	1.00	560
23		<input type="checkbox"/> SFE5040B-680M-F-HF	68.0 $\pm$ 20%	0.520	0.430	0.90	1.10	0.80	0.90	680
24		<input type="checkbox"/> SFE5040B-101M-F-HF	100.0 $\pm$ 20%	0.728	0.645	0.75	0.85	0.70	0.80	101
25		<input type="checkbox"/> SFE5040B-151M-F-HF	150.0 $\pm$ 20%	0.975	0.840	0.65	0.67	0.60	0.70	151
26		<input type="checkbox"/> SFE5040B-221M-F-HF	220.0 $\pm$ 20%	1.820	1.570	0.48	0.55	0.40	0.50	221
27		<input type="checkbox"/> SFE5040B-331M-F-HF	330.0 $\pm$ 20%	2.600	2.340	0.50	0.58	0.35	0.40	331
28		<input type="checkbox"/> SFE5040B-391M-F-HF	390.0 $\pm$ 20%	3.250	2.590	0.35	0.45	0.32	0.32	391
29		<input type="checkbox"/> SFE5040B-471M-F-HF	470.0 $\pm$ 20%	3.900	3.150	0.37	0.43	0.35	0.40	471
30		<input type="checkbox"/> SFE5040B-561M-F-HF	560.0 $\pm$ 20%	4.914	3.670	0.31	0.36	0.31	0.35	561
31		<input type="checkbox"/> SFE5040B-681M-F-HF	680.0 $\pm$ 20%	5.070	3.830	0.30	0.35	0.25	0.30	681
32		<input type="checkbox"/> SFE5040B-102M-F-HF	1000.0 $\pm$ 20%	7.800	6.030	0.25	0.30	0.30	0.32	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

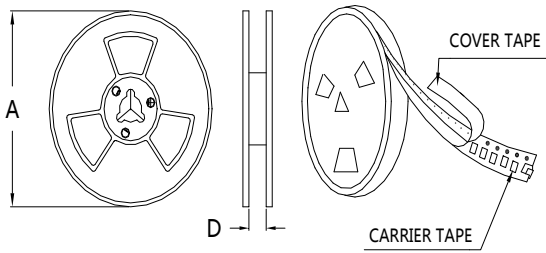
7. PACKAGING(unit: mm)

1.包装类型：编带装

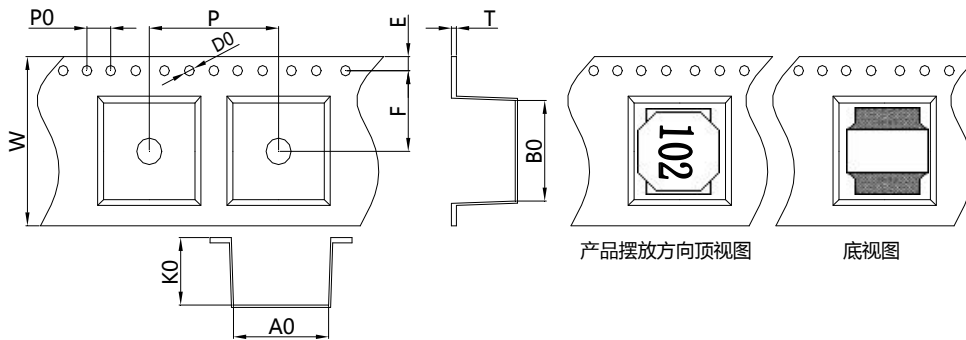
2.包装尺寸：

13" 盘

7" 盘



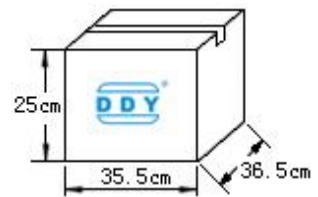
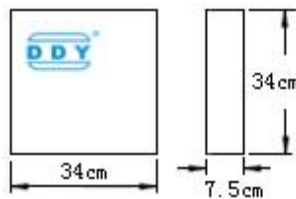
	13" 盘	7" 盘
A	$\Phi 330 \pm 2.0$	$\Phi 178 \pm 2.0$
D	12.5	



产品摆放方向顶视图

底视图

Size	Item	W	A0	B0	K0	P	T	E	F	D0	P0
5040	(mm)	12.0±0.3	5.5±0.3	5.5±0.3	4.4±0.2	8.0±0.3	0.4±0.1	1.75±0.1	5.5±0.1	1.5±0.1	4.0±0.2



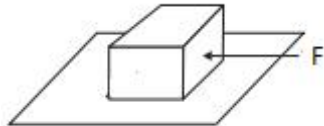
每卷	1500	Pcs
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每盒	4卷,共	6000	Pcs
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每箱	3盒,共	18000	Pcs
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**8. RELIABILITY TEST**

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

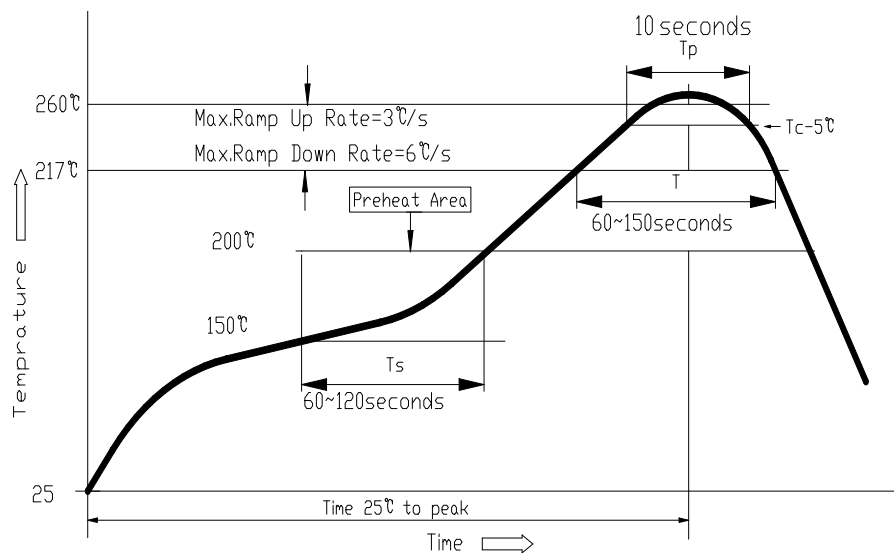
Applicable soldering process to the products is refl.

### 9.1 Soldering Materials

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

(2) Flux: Use rosin-based flux, but not strongly acidic flux (with 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:  $\leq 30$ W;
- ③ Diameter of soldering iron end:  $\leq 1.0$ mm;
- ④ Soldering time:  $< 3$  s



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