

承認書

SPECIFICATION FOR APPROVAL

Customer Name: 2144

Description Part No.:

Customer Part No.:

Sample No.:

DDY Part No.: SFEK4012A-

DRAWING		
MADE	CHECKED	APPROVED
王海玲	赵万虎	肖中华
DATE: 2023年9月7日		

CUSTOMER APPROVE



惠州市德立电子有限公司

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[illegible]



1. Scope

This specification applies to the SFEK4012 Series of wire wound SMD power inductor.

2.PRODUCT IDENTIFICATION

SFEK 4012 □ - 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)

(4) .Inductance value (电感值)

A: dodecagon (十二边形) : B: octagon (八边形)

1R5: 1.5 μ H 221: 220 μ H

(5) Tolerance (误差值)

(6) .Environmental status (环保状态)

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

LF- Lead free; HF-Halogen free;

FP-Free red phosphor.

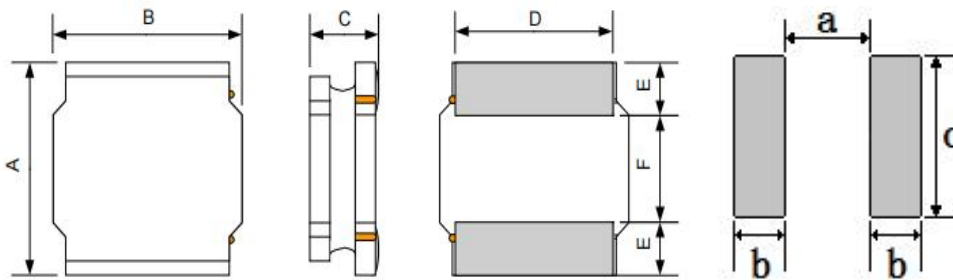
3. Electrical Characteristics

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). Irms:DC current that causes the temperature rise ($\Delta T = 40^{\circ}\text{C}$) 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.
SFEK4012A	4.0 ± 0.2	4.0 ± 0.2	1.2 Max.	3.4 ± 0.2	1.0 Typ.	2.0 Typ.	1.80	1.20	3.6



5. Electrical Characteristics

NO.	Part Number	Inductance	DC Resistance		Isat(A)		Irms(A)		Marking
		1MHz/0.1V	Max.	Typ.	Max.	Typ.	Max.	Typ.	
	Units	(uH)	Ω	Ω	A	A	A	A	
1	□ SFEK4012A-R47N-HF	0.47±30%	0.042	0.033	6.00	7.50	4.20	5.20	N/A
2	□ SFEK4012A-R68N-HF	0.68±30%	0.048	0.037	5.00	5.60	4.00	4.70	N/A
3	□ SFEK4012A-1R0N-HF	1.0±30%	0.066	0.053	4.50	5.30	3.60	4.20	N/A
4	□ SFEK4012A-1R5N-HF	1.5±30%	0.070	0.056	3.90	4.50	3.20	3.90	N/A
5	□ SFEK4012A-2R2M-HF	2.2±20%	0.102	0.082	2.50	2.80	2.30	2.80	N/A
6	□ SFEK4012A-3R3M-HF	3.3±20%	0.145	0.096	2.30	2.60	2.20	2.50	N/A
7	□ SFEK4012A-4R7M-HF	4.7±20%	0.187	0.150	2.30	2.60	1.90	2.20	N/A
8	□ SFEK4012A-6R8M-HF	6.8±20%	0.255	0.188	1.60	2.20	1.60	1.90	N/A
9	□ SFEK4012A-100M-HF	10.0±20%	0.408	0.325	1.40	1.80	1.10	1.50	N/A
10	□ SFEK4012A-150M-HF	15.0±20%	0.632	0.506	1.20	1.60	0.90	1.25	N/A
11	□ SFEK4012A-220M-HF	22.0±20%	0.763	0.611	1.10	1.35	0.75	0.95	N/A

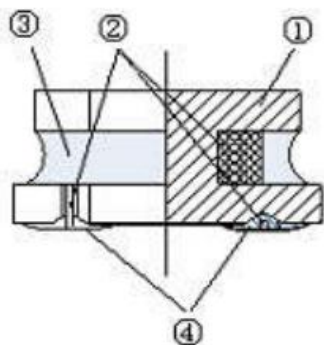
※Design as Customer's Requested Specifications. (可按顾客的特殊需求设计)



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6. Structure (The structure of product.)



NO	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

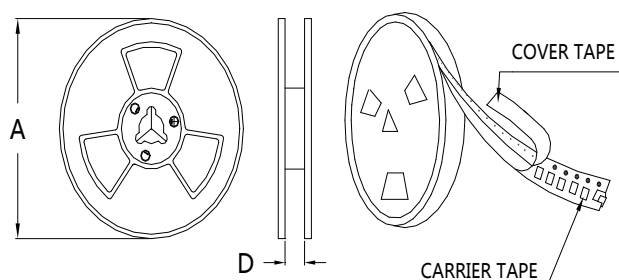
2.包装尺寸：



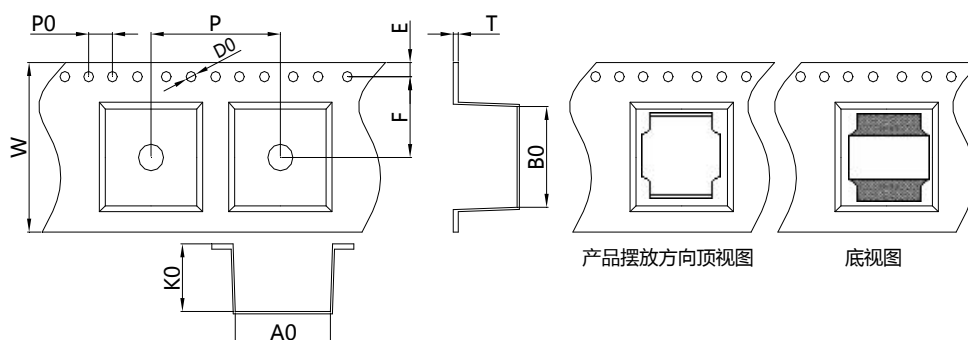
13" 盘



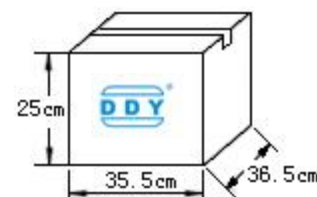
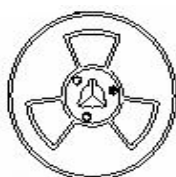
7" 盘



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



Item	W	A0	B0	K0	P	T	E	F	D0	P0
(mm)	12.0 ± 0.3	4.4 ± 0.2	4.4 ± 0.2	1.4 ± 0.1	8.0 ± 0.3	0.3 ± 0.1	1.75 ± 0.1	5.5 ± 0.2	1.5 ± 0.1	4.0 ± 0.2



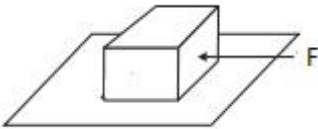
每卷	4500	Pcs
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每盒	4卷,共	18000	Pcs
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每箱	3盒,共	54000	Pcs
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8. RELIABILITY TEST

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 ± 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 : $260 \pm 0/-5^{\circ}\text{C}$
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°C reflow, apply a standard force on the side of the test samples for 10 seconds. 



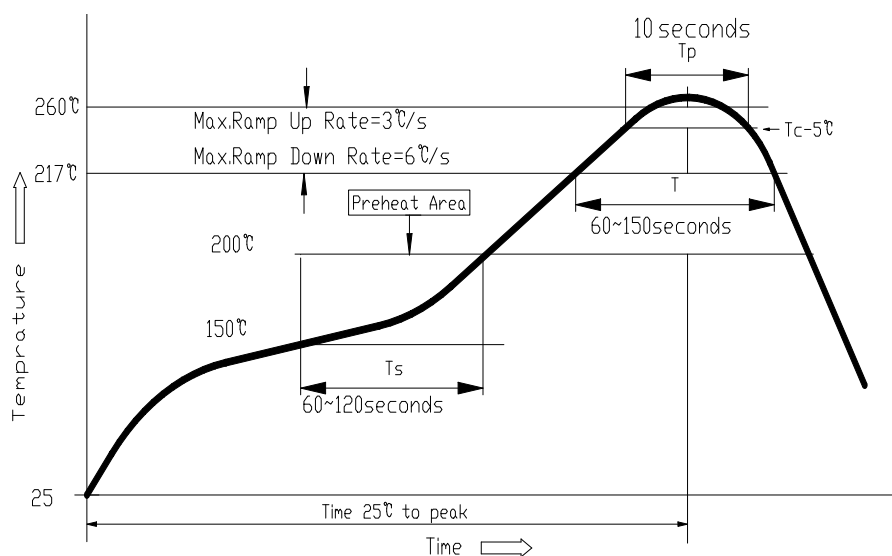
9. SOLDERING CONDITIONS

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: ≤30W;
- ③ Diameter of soldering iron end: ≤1.0mm;
- ④ Soldering time: <3 s

