

承 認 書

SPECIFICATION FOR APPROVAL

Customer's Part No: 2144

Customer's Part Name: _____

Customer's Part No: _____

Customer's Part Name: _____

Customer's Part No: UHG6234C/

DRAWING		
MADE	CHECKED	APPROVED
王海玲	赵万虎	肖中华
DATE: 2023年8月8日		

CUSTOMER APPROVE



惠州市德立电子有限公司

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1. Scope

This specification applies to the SFE4012 Series of wire wound SMD power inductor.

2.PRODUCT IDENTIFICATION

SFE 4012 □ - 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)
- (5) Tolerance (误差值)
- (6) .Identification code (标识码)

A: dodecagon (十二边形) ; B: octagon (八边形) 1R5: 1.5μH 221: 220μH

M: ±20%; N: ±30%

- (7) .Environmental status (环保状态)

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

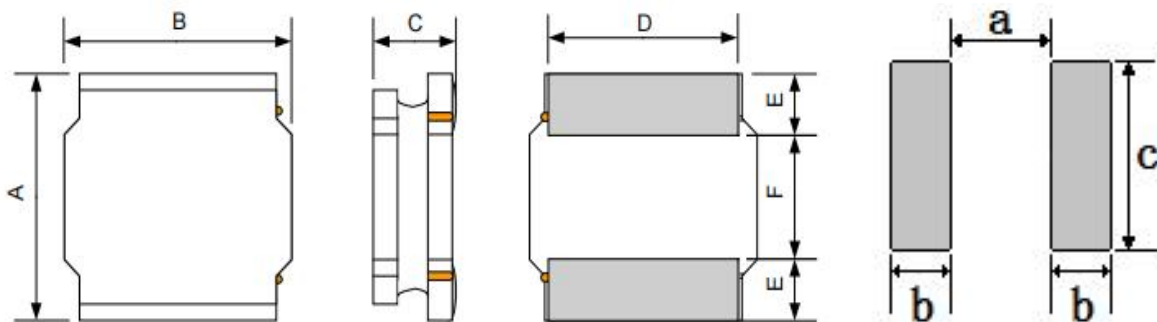
3. Electrical Characteristics

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 L₀ at Isat.

4. Shape and Dimensions (Unit:mm)

shape: A



Recommended Land Pattern

Series	A	B	C	D	E	F	a Typ.	b Typ.	c Typ.
SFE4012A	4.0±0.2	4.0±0.2	1.2 Max.	3.3±0.2	1.2 Typ.	1.6 Typ.	1.4	1.4	3.5



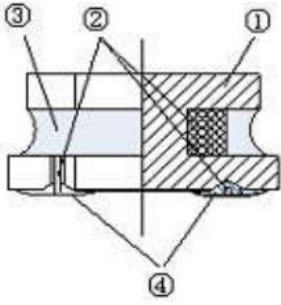
5. Electrical Characteristics

NO.	DDY CODE	Part Number	Inductance	DC Resistance		Isat(A)		Irms(A)		Marking
			100KHz/1.0V	Max.	Typ.	Max.	Typ.	Max.	Typ.	
		Units	(uH)	Ω	Ω	A	A	A	A	
1		<input type="checkbox"/> SFE4012A-R33N-F-HF	0.33±30%	0.035	0.026	3.60	4.30	3.00	3.30	R33
2		<input type="checkbox"/> SFE4012A-R82N-F-HF	0.82±30%	0.065	0.059	3.05	3.30	1.75	2.50	R82
3		<input type="checkbox"/> SFE4012A-1R0N-F-HF	1.0±30%	0.065	0.059	2.61	3.20	1.65	2.50	1R0
4		<input type="checkbox"/> SFE4012A-1R5N-F-HF	1.5±30%	0.085	0.073	2.10	2.70	1.46	2.20	1R5
5		<input type="checkbox"/> SFE4012A-1R8N-F-HF	1.8±30%	0.104	0.073	2.12	2.50	1.32	1.90	1R8
6		<input type="checkbox"/> SFE4012A-2R2M-F-HF	2.2±20%	0.104	0.088	1.76	2.30	1.32	1.90	2R2
7		<input type="checkbox"/> SFE4012A-2R7M-F-HF	2.7±20%	0.117	0.090	1.90	2.10	1.25	1.70	2R7
8		<input type="checkbox"/> SFE4012A-3R3M-F-HF	3.3±20%	0.143	0.110	1.72	2.10	1.12	1.60	3R3
9		<input type="checkbox"/> SFE4012A-4R7M-F-HF	4.7±20%	0.163	0.137	1.15	1.80	1.05	1.50	4R7
10		<input type="checkbox"/> SFE4012A-5R6M-F-HF	5.6±20%	0.182	0.159	1.00	1.60	1.00	1.20	5R6
11		<input type="checkbox"/> SFE4012A-6R8M-F-HF	6.8±20%	0.257	0.227	0.85	1.40	0.84	1.10	6R8
12		<input type="checkbox"/> SFE4012A-100M-F-HF	10.0±20%	0.345	0.308	0.80	1.10	0.77	1.00	100
13		<input type="checkbox"/> SFE4012A-120M-F-HF	12.0±20%	0.377	0.308	0.66	1.00	0.70	0.95	120
14		<input type="checkbox"/> SFE4012A-150M-F-HF	15.0±20%	0.442	0.412	0.56	0.80	0.64	0.85	150
15		<input type="checkbox"/> SFE4012A-220M-F-HF	22.0±20%	0.763	0.713	0.46	0.70	0.49	0.70	220
16		<input type="checkbox"/> SFE4012A-330M-F-HF	33.0±20%	1.053	0.915	0.42	0.60	0.42	0.58	330
17		<input type="checkbox"/> SFE4012A-470M-F-HF	47.0±20%	1.430	1.340	0.35	0.50	0.37	0.50	470
18		<input type="checkbox"/> SFE4012A-680M-F-HF	68.0±20%	2.080	1.630	0.35	0.42	0.27	0.35	680
19		<input type="checkbox"/> SFE4012A-820M-F-HF	82.0±20%	2.392	1.840	0.28	0.38	0.26	0.32	820
20		<input type="checkbox"/> SFE4012A-101M-F-HF	100.0±20%	2.873	2.620	0.25	0.32	0.25	0.32	101

※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

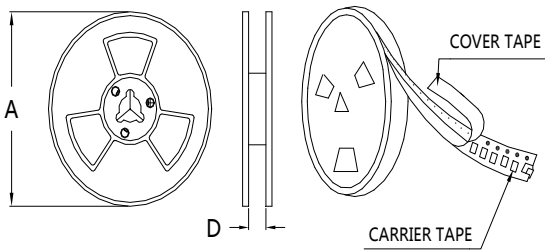
7. PACKAGING(unit: mm)

1.包装类型：编带装

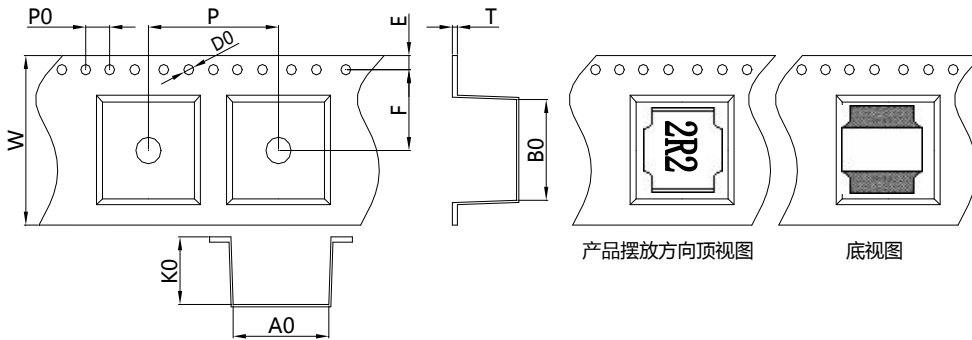
2.包装尺寸：

13" 盘

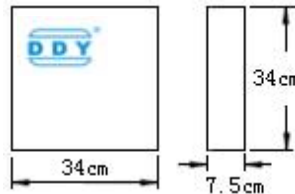
7" 盘



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



Size	Item	W	A0	B0	K0	P	T	E	F	D0	P0
4012	(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

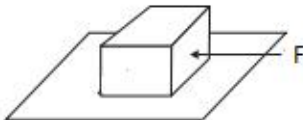


每卷	4500	Pcs
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每盒	4卷,共	18000	Pcs
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每箱	3盒,共	54000	Pcs
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8. RELIABILITY TEST			
No.	TEST ITEM	SPECIFICATION	TEST CONDITION
1	High temperature Storage test	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 : $260 + 0 / - 5^{\circ}\text{C}$
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

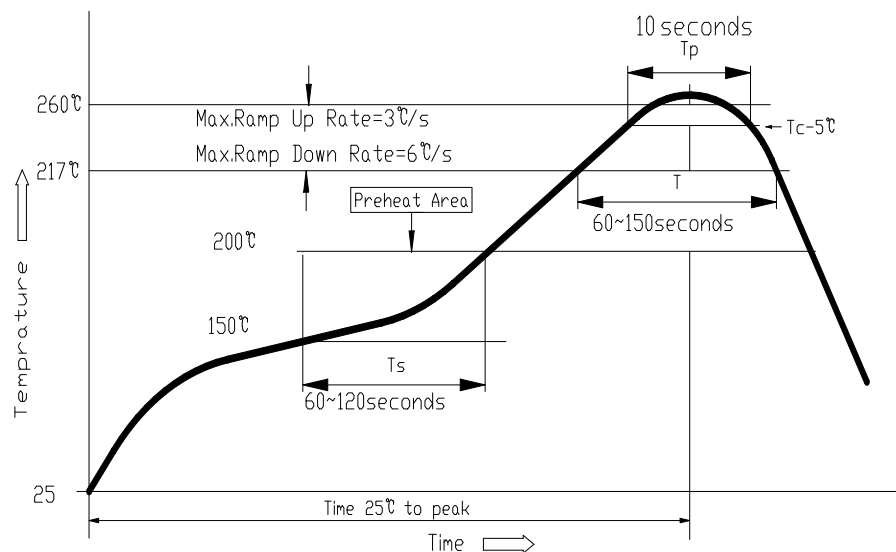
Applicable soldering process to the products is refl.

9.1 Soldering Materials

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

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



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