

■贴片功率电感器

SMD power inductor

◆特征

Feature

- * 高性能
High performance.
- * 高可靠性
High reliability.
- * 高绝缘能力
High insulation capacity.
- * 符合 RoHS
Compliance with RoHS.
- * 工作温度范围：-40℃~125℃ (包含自身发热)
Operating Temperature Range, Including self-heating temperature rise: -40℃~+125℃.

◆应用

Application

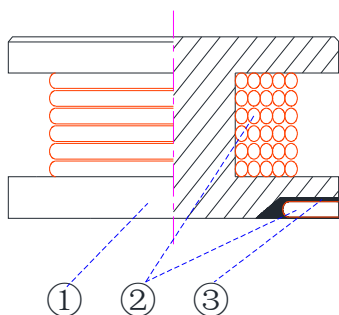
- *手机、DC/DC 转换、AV 设备、OA 设备、家电、信息服务等电子设备。
Electronic devices such as mobile phones, DC/DC converters, AV equipment, OA equipment, household appliances, and information services.

◆型号表示法

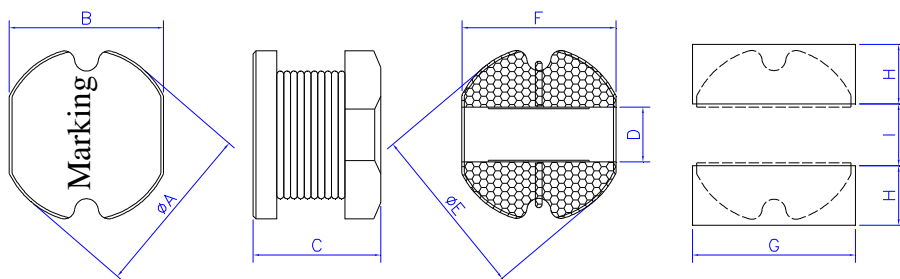
Part Number

PIO	43	-	1R0	M	T	***
①	②		③	④	⑤	⑥

① 产品代号 Product Code		② 尺寸代码 Dimensions code		③ 电感量标称值 Inductance		④ 电感量公差代码 Tolerance code	
PIO	PIO 系列贴片功率电感器	43	4.5*4.0*3.2 mm	1R0	1.0μH	K	±10%
	器	54	5.8*5.2*4.5 mm	100	10μH	M	±20%
	PIO Series SMD	75	7.8*7.0*5.0 mm	101	100μH	N	±30%
	Power Inductor						
⑤ 包装方式 Packaging		⑥ 内部代码 Internal code					
T	卷带盘装 Tape & Reel	***	内部代码 Internal code				

◆产品结构
Product Structure


No.	部位 Component	材料 Material
①	磁芯 Core	镍锌铁氧体磁芯 Ni-Zn ferrite core
②	线圈 Winding	漆包线 Enamelled wire
③	电极 Electrode	底层-银 Substrate-Ag 镀层-镍层 Base plating-Ni 镀层-锡层 Base plating-Sn 表层-锡/铜 Surface solder-Sn/Cu

◆规格尺寸
Dimension


RECOMMENDED
LAND PATTERNS

Part No	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)	I(mm)
43	4.50±0.30	4.00±0.20	3.20±0.30	1.60 typ.	4.50 typ.	4.00 typ.	4.50 typ.	1.75 typ.	1.50 typ.
54	5.80±0.30	5.20±0.30	4.50±0.30	2.00 typ.	5.80 typ.	5.20 typ.	5.50 typ.	2.15 typ.	1.70 typ.
75	7.80±0.30	7.00±0.30	5.00±0.30	2.50 typ.	7.80 typ.	7.00 typ.	7.50 typ.	3.00 typ.	2.00 typ.

◆电性能参数
Electrical Characteristics
PIO43 Series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		额定电流 IDC (A)	印字 Marking
	Nominal value	Tol.			Max.	
PIO43-1R0_T	1.00	N: ± 30% M: ± 20%	0.045	Max.	3.50	1R0
PIO43-1R5_T	1.50		0.055	Max.	2.85	1R5
PIO43-2R2_T	2.20		0.070	Max.	2.40	2R2
PIO43-2R7_T	2.70		0.075	Max.	2.30	2R7
PIO43-3R3_T	3.30		0.085	Max.	2.25	3R3
PIO43-3R9_T	3.90		0.090	Max.	1.70	3R9
PIO43-4R7_T	4.70		0.105	Max.	1.65	4R7
PIO43-5R6_T	5.60		0.120	Max.	1.60	5R6
PIO43-6R8_T	6.80		0.130	Max.	1.40	6R8
PIO43-8R2_T	8.20		0.145	Max.	1.30	8R2
PIO43-100_T	10.00	N: ± 30% M: ± 20% K: ± 10%	0.180	Max.	1.10	100
PIO43-120_T	12.00		0.210	Max.	1.00	120
PIO43-150_T	15.00		0.235	Max.	0.85	150
PIO43-180_T	18.00		0.330	Max.	0.80	180
PIO43-220_T	22.00		0.360	Max.	0.70	220
PIO43-270_T	27.00		0.520	Max.	0.65	270
PIO43-330_T	33.00		0.540	Max.	0.60	330
PIO43-390_T	39.00		0.580	Max.	0.55	390
PIO43-470_T	47.00		0.840	Max.	0.48	470
PIO43-560_T	56.00		0.930	Max.	0.46	560
PIO43-680_T	68.00		1.110	Max.	0.44	680
PIO43-820_T	82.00		1.250	Max.	0.42	820
PIO43-101_T	100.00		1.400	Max.	0.40	101
PIO43-121_T	120.00		1.500	Max.	0.38	121
PIO43-151_T	150.00		2.000	Max.	0.35	151
PIO43-181_T	180.00		2.120	Max.	0.30	181
PIO43-221_T	220.00		2.460	Max.	0.27	221

IDC: 指使电感量比初始值下降 10%或电感器表面温度上升 40℃的电流值 (参考周围环境温度 20℃)。

The rated DC current is that which cause a 10% inductance reduction from the initial value or inductor surface temperature to rise by 40℃, whichever is smaller. (Reference ambient temperature 20℃).

额定工作使用电压: DC50V

Rated working voltage: DC50V

项目 Item	测试条件 Test condition	测试仪器 Test equipment
电感量 Ls	<100μH 100kHz/500 mV ≥ 100μH 1kHz/500mV	HP4263B\IM3532-50 or equivalent
直流电阻 RDC	直流电 direct-current	HP4263B\RM3545 or equivalent
饱和电流 Isat	<100μH 100kHz/500 mV ≥ 100μH 1kHz/500mV	Microtest 6379 & 6220 or equivalent

PIO54 series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		额定电流 IDC (A)	印字 Marking
	Nominal value	Tol.			Max.	
PIO54-R47NT	0.47	±30%	0.012	Max.	4.80	R47
PIO54-1R0_T	1.00	N: ±30% M: ±20%	0.025	Max.	3.50	1R0
PIO54-1R5_T	1.50		0.025	Max.	3.30	1R5
PIO54-2R2_T	2.20		0.028	Max.	3.20	2R2
PIO54-2R7_T	2.70		0.030	Max.	3.00	2R7
PIO54-3R3_T	3.30		0.035	Max.	2.50	3R3
PIO54-3R9_T	3.90		0.038	Max.	2.40	3R9
PIO54-4R7_T	4.70		0.040	Max.	2.30	4R7
PIO54-4R7_T3R1	4.70		0.040	Max.	3.10	4R7
PIO54-5R6_T	5.60		0.050	Max.	2.10	5R6
PIO54-6R8_T	6.80		0.055	Max.	2.00	6R8
PIO54-7R2_T	7.20		0.070	Max.	1.80	7R2
PIO54-8R2_T	8.20		0.090	Max.	1.70	8R2
PIO54-100_T	10.00	N: ±30% M: ±20% K: ±10%	0.100	Max.	1.65	100
PIO54-120_T	12.00		0.120	Max.	1.55	120
PIO54-150_T	15.00		0.140	Max.	1.40	150
PIO54-180_T	18.00		0.150	Max.	1.25	180
PIO54-220_T	22.00		0.180	Max.	1.10	220
PIO54-270_T	27.00		0.200	Max.	0.95	270
PIO54-330_T	33.00		0.220	Max.	0.90	330
PIO54-390_T	39.00		0.300	Max.	0.80	390
PIO54-470_T	47.00		0.350	Max.	0.75	470
PIO54-560_T	56.00		0.400	Max.	0.70	560
PIO54-680_T	68.00		0.450	Max.	0.65	680
PIO54-820_T	82.00		0.600	Max.	0.60	820
PIO54-101_T	100.00		0.700	Max.	0.55	101
PIO54-121_T	120.00		0.850	Max.	0.45	121
PIO54-151_T	150.00		1.100	Max.	0.43	151
PIO54-181_T	180.00		1.350	Max.	0.40	181
PIO54-221_T	220.00		1.550	Max.	0.35	221
PIO54-331_T	330.00		1.760	Max.	0.30	331
PIO54-391_T	390.00		2.500	Max.	0.27	391
PIO54-471_T	470.00		2.500	Max.	0.25	471
PIO54-561_T	560.00		2.870	Max.	0.20	561
PIO54-681_T	680.00		3.500	Max.	0.18	681
PIO54-821_T	820.00		5.200	Max.	0.17	821
PIO54-102_T	1000.00		5.500	Max.	0.15	102
PIO54-122_T	1200.00		6.400	Max.	0.13	122

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直流电阻 RDC	直流电 direct-current	HP4263B\RM3545 or equivalent
饱和电流 Isat	<100μH 100kHz/500 mV ≥100μH 1kHz/500mV	Microtest 6379 & 6220 or equivalent

PIO75 series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		额定电流 IDC (A)	印字 Marking
	Nominal value	Tol.			Max.	
PIO75-1R0MT	1.0	N: ± 30% M: ± 20%	0.015	Max	5.80	1R0
PIO75-1R5MT	1.5		0.017	Max	5.50	1R5
PIO75-2R2MT	2.2		0.018	Max	5.20	2R2
PIO75-2R7MT	2.7		0.023	Max	5.00	2R7
PIO75-3R3MT	3.3		0.025	Max	4.80	3R3
PIO75-3R9MT	3.9		0.027	Max	4.20	3R9
PIO75-4R7MT	4.7		0.028	Max	4.00	4R7
PIO75-5R6MT	5.6		0.030	Max	3.80	5R6
PIO75-6R8MT	6.8		0.040	Max	3.00	6R8
PIO75-8R2MT	8.2		0.042	Max	2.70	8R2
PIO75-100MT	10	N: ± 30% M: ± 20% K: ± 10%	0.070	Max	2.55	100
PIO75-120MT	12		0.080	Max	2.40	120
PIO75-150MT	15		0.090	Max	2.00	150
PIO75-180MT	18		0.100	Max	1.95	180
PIO75-220MT	22		0.110	Max	1.70	220
PIO75-270MT	27		0.120	Max	1.55	270
PIO75-330MT	33		0.130	Max	1.40	330
PIO75-390MT	39		0.150	Max	1.35	390
PIO75-470MT	47		0.190	Max	1.25	470
PIO75-560MT	56		0.230	Max	1.10	560
PIO75-680MT	68		0.250	Max	1.00	680
PIO75-820MT	82		0.350	Max	0.95	820
PIO75-101KT	100		0.400	Max	0.78	101
PIO75-121KT	120		0.450	Max	0.73	121
PIO75-151KT	150		0.600	Max	0.70	151
PIO75-181KT	180		0.700	Max	0.60	181
PIO75-221KT	220		0.950	Max	0.55	221
PIO75-271KT	270		1.100	Max	0.50	271
PIO75-331KT	330		1.250	Max	0.45	331
PIO75-391KT	390		1.750	Max	0.40	391
PIO75-471KT	470		1.950	Max	0.35	471
PIO75-561KT	560		1.980	Max	0.32	561
PIO75-681KT	680		2.180	Max	0.31	681
PIO75-821KT	820		2.880	Max	0.30	821
PIO75-102KT	1000		3.850	Max	0.20	102
PIO75-152KT	1500		5.200	Max	0.18	152
PIO75-182KT	1800		7.000	Max	0.16	182
PIO75-202KT	2000		7.000	Max	0.16	202
PIO75-222KT	2200		8.300	Max	0.15	222

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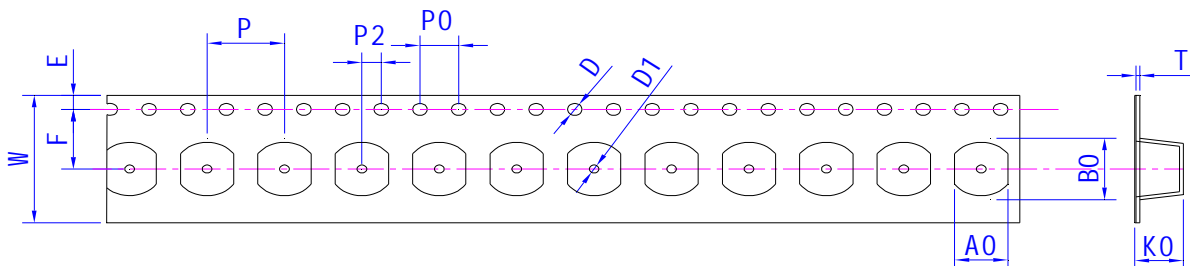
◆可靠性测试方法
Reliability Test Method

序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks
1	绝缘电阻 Insulation Resistance	$\geq 100M\Omega$	在电感器线圈和磁芯之间施加 100 V 直流电压保持 60s。 100 V DC between inductor coil and core for 60 seconds.
2	可焊性 Solderability	电极面 95%以上覆盖新的焊料。 95% or more of electrode area shall be coated by new solder.	在 $245^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 熔 融 的 焊 锡 (96.5Sn/3.0Ag/0.5Cu) 中浸 $3 \text{ s} \pm 0.3 \text{ s}$ 。 Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $245^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for (3 ± 0.3) seconds.
3	耐焊接热 Resistance to Soldering Heat	外观无可见机械损伤; 电感量变化率: $\pm 10\%$ 以内。 No visible mechanical damage. Inductance change: Within $\pm 10\%$	在 $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 熔 融 的 焊 锡 (96.5Sn/3.0Ag/0.5Cu) 中浸 $10 \text{ s} \pm 1 \text{ s}$ 。 Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for (10 ± 1) seconds.
4	端子强度 Adhesion of terminal electrode	元件的端子与本体结合无松动、 无脱落。 Strong bond between the pad and the core, without come off PC board.	将电感器用 $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$, $20 \text{ s} \pm 5 \text{ s}$ 焊在带有 0.3 mm 厚锡膏的基板上, 然后用治具垂直电极 面方向加压 10 N, $10 \text{ s} \pm 1 \text{ s}$ 。 Inductors shall be subjected to $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $20 \text{ s} \pm 5 \text{ s}$ Soldering in the base whit 0.3mm solder. And then aplomb electrode way plus tax 10 N for $10 \pm 1 \text{ s}$ seconds.
5	耐高温 High temperature	外观无可见机械损伤; 电感量变化率: $\pm 10\%$ 以内。 No visible mechanical damage. Inductance change: Within $\pm 10\%$	温度 $+125^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 时间 1000+24 0h, 在室 温下放置 2 小时后, 48 小时内测试。Temperature $125^{\circ}\text{C} \pm 2^{\circ}\text{C}$, time 1000+24 0h, Test within 48 hours after 2 hours of placement at room temperature
6	耐低温 Low temperature	外观无可见机械损伤; 电感量变化率: $\pm 10\%$ 以内。 No visible mechanical damage. Inductance change: Within $\pm 10\%$	温度 $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 时间 1000+24 0h; 在室 温下放置 2 小时后, 48 小时内测试。 Temperature $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$, time 1000+24 0h; Test within 48 hours after 2 hours of placement at room temperature

序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks
7	温度循环 Temperature Cycling	外观无可见机械损伤; 电感量变化率: ±10%以内。 No visible mechanical damage. Inductance change: Within ±10%	(-40±3) °C, 时间(30±3) min (125°C±2) °C/(30±3) min, 转换时间(2~3) min, 循环 32 次; 在室温下放置 2 小时后、48 小 时内测试。 The test sample shall be placed at (-40±3)°C and (125±2)°C for (30±3) min, different temperature conversion time is 2~3 minutes. The temperature cycle shall be repeated 32 cycles. Test within 48 hours after 2 hours of placement at room temperature.
8	温度特性 Temperature characteristic	电感量变化率 Pc-b, Pc-d 不超过 ±20%。 Inductance change Pc-b, Pc-d: Within ±20%	a: +20 °C (30~45) min → b: -40 °C (30~45) min → c: +20 °C (30~45) min → d: +125 °C (30~45) min → e: +20 °C (30~45) min $P_{c-b} = \frac{L_b - L_c}{L_c} \times 100\%$; $P_{c-d} = \frac{L_d - L_c}{L_c} \times 100\%$
9	恒定湿热 Constant damp heat	外观无可见机械损伤; 电感量变化率: ±10%以内。 No visible mechanical damage. Inductance change: Within ±10%	将电感器放置在于湿度(90~95)%RH, 温度 60 °C±2 °C 的环境中存放 1000+24 0h, 在室 温下放置 2 小时后、48 小时内测试。 Place inductors in humidity (90~95)%RH, 60 °C ± 2 °C temperature 1000+24 0h, Test within 48 hours after 2 hours of placement at room temperature.
10	高温负载 (寿命) High-temperature load (Life-span)	外观无可见机械损伤; 电感量变化率: ±10%以内。 No visible mechanical damage. Inductance change: Within ±10%	温度 85 °C±2°C, 时间 1000+24 0h, 施加额定 电流, 在室温下放置 2 小时后、48 小时内测试。 Temperature 85 °C ± 2 °C, Time 1000+24 0h, Apply a rated current, Test within 48 hours after 2 hours of placement at room temperature. 注: 加载电流时零件表面温度超过 125°C 的, 需 要对电流降额到零件表面温度不超过 125°C。 Note: If the surface temperature of the part over 125 °C when the current is loaded, the current need to reduce until the surface temperature of the part less than 125 °C.

◆包装
Packaging
● 载带尺寸 (单位: mm)

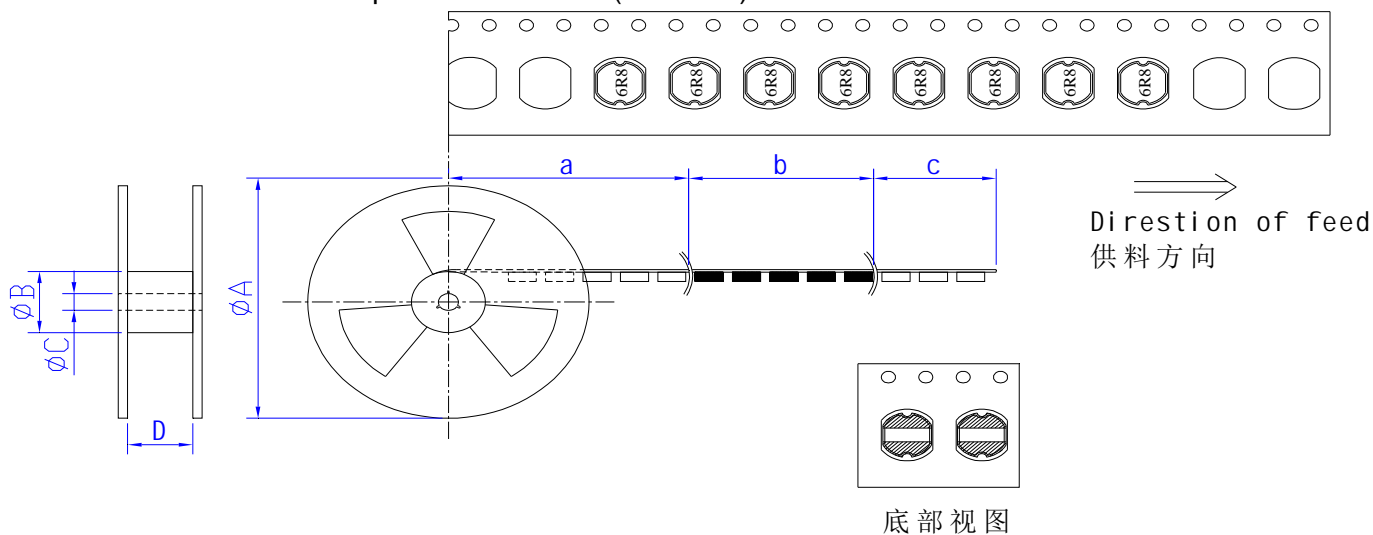
Taping Dimension (Unit: mm)



系列 Series	W	A0	B0	D	D1	E	F	K0	P0	P2	P	T
43	12.0±0.5	4.3±0.3	4.8±0.3	1.5±0.3	---	1.75±0.3	5.5±0.3	3.6±0.3	4.0±0.3	2.0±0.3	8.0±0.3	0.35±0.10
54	16.0±0.5	5.5±0.3	6.7±0.3	1.5±0.3	---	1.75±0.3	7.5±0.3	4.9±0.3	4.0±0.3	2.0±0.3	8.0±0.3	0.40±0.10
75	16.0±0.5	7.3±0.3	8.1±0.3	1.5±0.3	---	1.75±0.3	7.5±0.3	5.6±0.3	4.0±0.3	2.0±0.3	12.0±0.3	0.375±0.10

● 卷盘尺寸及产品方向(单位: mm)

Reel dimensions and products direction (Unit: mm)



Series	A	B	C	D	a	b	c
43	330 typ.	100 typ.	13 typ.	12.4 typ.	空带 Blank portions	装元件 Chip cavity	引带 Leader
54	330 typ.	100 typ.	13 typ.	16.4 typ.	空带 Blank portions	装元件 Chip cavity	引带 Leader
75	330 typ.	100 typ.	13 typ.	16.4 typ.	空带 Blank portions	装元件 Chip cavity	引带 Leader

* 剥离力检验

Peeling off force



(1) 盖带的剥离力：沿面胶移动方向拉时要求剥离力为 0.1N~1.0N。

Peeling force should be 0.1~0.7N pulling in the direction of arrow.

(2) 剥离速度：300mm/min。

Speed of peeling off: 300mm/min.

(3) 在纸带剥落时，面胶不能有破损，不能粘纸带。

The cover bond should not be damaged and bond the tape when it peeled off.

型号 Size	43	54	75
每卷数量 REEL	2000	1500	1000
每盒数量 BOX	8000	4500	3000
每箱数量 CASE	24000	13500	9000

● 标签粘贴位置

Label stick station

卷盘标签 Reel label	纸盒标签 Carton label	外箱标签 Outer box label
		

◆ 推荐焊接条件

Recommend Soldering Conditions

● 焊接条件

Soldering Conditions

* 本产品建议使用回流焊接法。

Applicable soldering process to the products is reflow soldering.

* 焊接材料

Soldering Materials

焊料：Sn-3.0Ag-0.5Cu

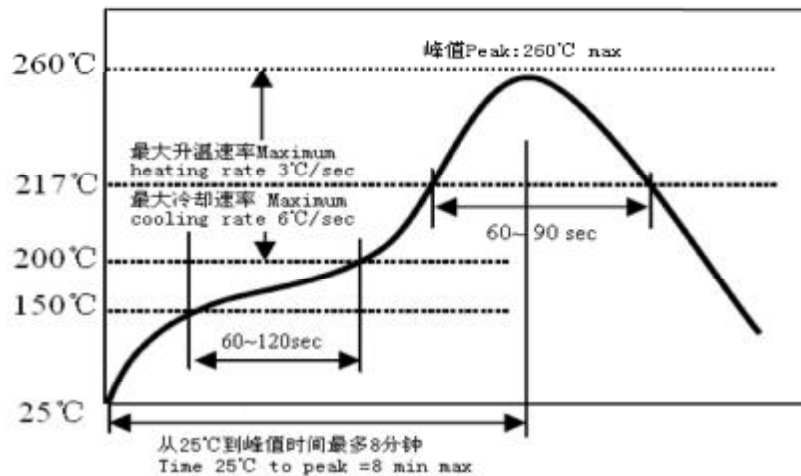
Solder: Sn-3.0Ag-0.5Cu

助焊剂：使用松香基助焊剂，禁止使用卤化物含量超过 0.2wt% 的强酸性助焊剂和水溶性助焊剂。

Flux: Use rosin-based flux, but not strongly acidic flux with chlorine exceeding 0.2 wt%. Do not use water-soluble flux.

● 回流焊曲线

Reflow soldering profile



- (1) 预热条件: 150 ~ 200°C / 60 ~ 120 秒;
Preheat condition: 150 ~ 200°C / 60~120sec
- (2) 允许大于 217°C 时间: 60—90 秒;
Allowed time above 217°C: 60~90sec
- (3) 最大温度: 260 °C;
Max temp: 260 °C
- (4) 最高温的最大时间: 10 秒;
Max time at max temp: 10 sec
- (5) 焊膏: Sn/3.0Ag/0.5Cu;
Solder paste: Sn/3.0Ag/0.5Cu

● 手工焊接

Iron soldering

烙铁温度: 350°C

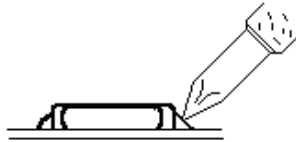
Perform soldering at 350°C.

功率: 最大为 30W

Soldering iron power output: ≤30W.

烙铁停留时间: < 3S (注意不能直接用焊头接触磁体)

Time: < 3S, do not directly touch the core with the tip of the soldering iron.



◆清洗

Cleaning

避免用超声波清洗，如果被超声波清洗，产品可能会被破坏。

Washing by supersonic shall be avoided. If washed by supersonic waves, the products might be broken.

◆存储要求

Storage Requirements

●存储期限

Storage period

距电感公司出厂检验时间 1 年内，产品可以使用检验时间可以通过包装外侧标签确认。若时间超过 1 年，应检查焊接性能后方可使用。

Products which inspected inductor company over 1 year ago should be examined and used, which can be Confirmed with label on the container. Solder ability should be checked if this period is exceeded.

●存储条件

Storage conditions

- (1) 存放货物的仓库应满足以下条件：

Store products in a warehouse in compliance with the following condition:

温度：产品（产品在封带中） -10 to +40°C;

产品本体 -40 to +85°C.

Temperature: Inductors (product with taping) -10 to +40°C;

Inductors body -40 to +85°C.

相对湿度: 30~70%RH.

Humidity: 30~70%RH.

- (2) 不要使产品遭受温度和湿度的快速变化。

Do not subject products to rapid changes in temperature and humidity.

- (3) 不要将产品存放在化学环境中，如硫酸气体或碱性气体中，否则会降低电极端子的焊接特性和使电感器腐蚀。

Do not store the products in chemical atmosphere such as one containing sulfurous acid gas or alkaline gas, that will causes poor solderability and corrosion of inductors.

- (4) 不要以散包装的形式存放产品以防止电感器间的相互碰撞造成磁芯破裂或断线。

Do not store products in bulk packaging to prevent collision among inductors which causes core chipping and wire breakage.

- (5) 为了避免受潮气、灰尘等物质的影响，产品应保管于货架上。

Store products on pallets to protect from humidity, dust, etc.

◆注意事项

Notes

- (1) 本公司产品适用于 AV 设备、OA 设备、家电、信息服务等一般电子设备中。

Our products are designed and promoted for use in general electronic devices such as audio-equipment, office automation equipment, household appliance and information service.

- (2) 当本公司的产品使用在一般电子设备以外的领域时，对于此所引发的设备失效我司将不承担任何法律责任。

In case of using the product for the purpose other than general electronics devices, we shall not be held liable for any dysfunctions in or damage to the equipment with which the product is used.

- (3) 本承认书只保证我司产品作为一个单体时的质量情况，当我司产品被安装到贵公司产品上时，请贵司对使用在贵司电路上的产品情况进行了有效评价和确认。

Our specification limits the quality of the component as a single unit. Please ensure the component is thoroughly evaluated in your application circuit.

- (4) 不要对产品施加过大的振动或机械冲击。
Do not apply excessive vibration or mechanical shock to products.
- (5) 为防止断线，请不要使用锋利的物体接触线圈，如镊子。
Do not touch wire with sharp objects such as tweezers to prevent wire breakage.
- (6) 在产品贴装时不要使用过大的压力，避免磁芯断裂。
Do not apply excessive stress to products mounted on boards to prevent core breakage.

■ 修订履历

版本	日期	修订内容	修订人
24.01	2023-12-13	首次发行 Initial issue	王志聪
A0	2025-7-14	更新模版格式 Update the template format.	王志聪

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