

■贴片功率电感器

SMD power inductor

◆特征

Feature

- * 高性能
High performance.
- * 磁胶屏蔽结构
Magnetic adhesive shielding structure.
- * 高可靠性
High reliability.
- * 符合 RoHS
Compliance with RoHS.
- * 工作温度范围: $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ (包含自身发热)
Operating Temperature Range, Including self-heating temperature rise: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$.

◆应用

Application

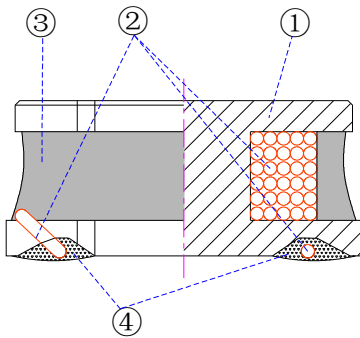
- * 手机、DC/DC 转换、AV 设备、OA 设备、家电、信息服务等电子设备。
Electronic devices such as mobile phones, DC/DC converters, AV equipment, OA equipment, household appliances, and information services.

◆型号表示法

Part Number

MRS	3015	-	1R0	M	T	***
①	②		③	④	⑤	⑥

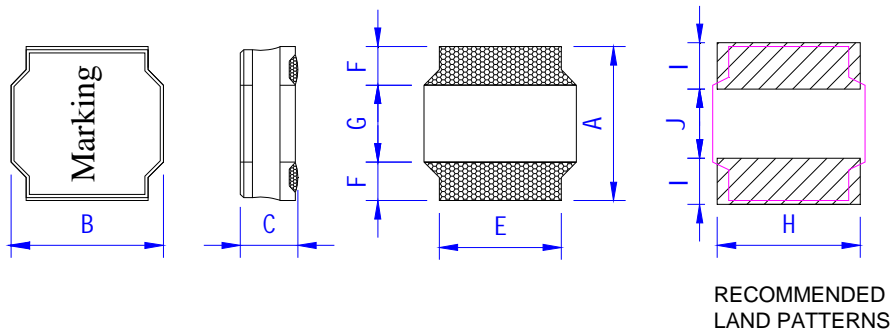
① 产品代号 Product Code		② 尺寸代码 Dimensions code		③ 电感量标称值 Inductance		④ 电感量公差代码 Tolerance code	
MRS	MRS 系列贴片功率电感器 MRS Series SMD Power Inductor	2512	2.5*2.1*1.25mm	1R0	1.0μH	M	±20%
		3015	3*3*1.5 mm	100	10μH	N	±30%
		4020	4*4*2.0mm	101	100μH		
⑤ 包装方式 Packaging		⑥ 内部代码 Internal code					
T	卷带盘装 Tape & Reel	***	内部代码 Internal code				

◆产品结构
Product Structure


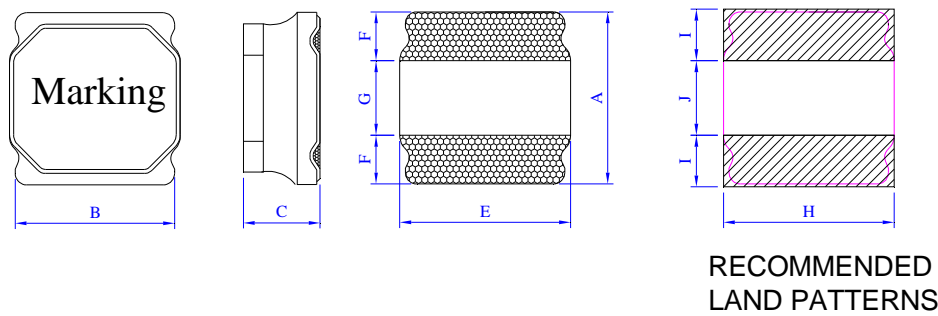
No.	部位 Component	材料 Material
①	磁芯 Core	金属材料 Metal material
②	线圈 Winding	漆包线 Enamelled wire
③	保护层 Shield	导磁胶 Magnetic glue
④	电极 Electrode	底层-银 Substrate-Ag 镀层-镍层 Base plating-Ni 镀层-锡层 Base plating-Sn 表层-锡/铜 Surface solder-Sn/Cu

◆规格尺寸
Dimension

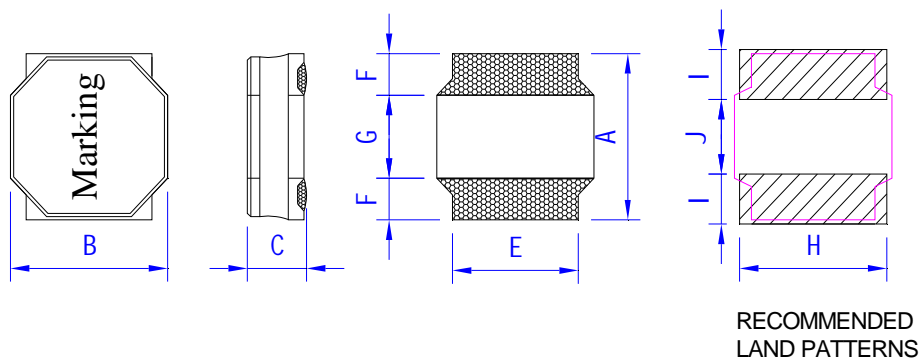
MRS2512-Y00 series



MRS3015-S00 series



MRS4020-S00 series



Part No	A(mm)	B(mm)	C(mm)	E(mm)	F(mm)	G(mm)	H(mm)	I(mm)	J(mm)
2512	2.50 + 0.3/-0.1	2.00 + 0.3/-0.1	1.25 Max	1.80 typ.	0.85 typ.	0.80 typ.	2.10 typ.	0.85 typ.	0.80 typ.
3015	3.00±0.20	3.00±.20	1.60 Max	2.80 typ.	0.85 typ.	1.30 typ.	3.00 typ.	0.90 typ.	1.30 typ.
4020	4.00±0.20	4.00±0.20	2.10 Max	3.40 typ.	1.00 typ.	2.00 typ.	3.60 typ.	1.40 typ.	1.60 typ.

◆电性能参数

Electrical Characteristics

MRS2512-Y00 Series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		饱和电流 Isat (A)	温升电流 Irms (A)	印字 Marking
	Nominal value	Tol.			Max.	Max.	
MRS2512-R47NTY00	0.47	30%	0.039	Max.	4.20	3.40	
MRS2512-1R0_TY00	1.00	N:±30% M:±20%	0.066	Max.	3.50	2.80	
MRS2512-1R5_TY00	1.50		0.100	Max.	2.90	2.40	
MRS2512-2R2_TY00	2.20		0.120	Max.	2.60	1.90	
MRS2512-3R3_TY00	3.30		0.176	Max.	1.70	1.50	
MRS2512-4R7_TY00	4.70		0.260	Max.	1.60	1.25	
MRS2512-6R8_TY00	6.80		0.366	Max.	1.15	0.95	
MRS2512-100_TY00	10.00		0.500	Max.	1.10	0.85	

Isat: 指使电感量比初始值下降约 30% 的电流值, 加载电流的时间 1 秒以内。

The DC current at which the inductance drops approximate 30% from its value without current, Load current time within 1 s.

Irms: 指使电感器表面温度上升 40℃ 的电流值。

The DC current is inductor surface temperature to rise by 40℃.

额定工作使用电压: DC25V

Rated working voltage: DC25V

项目 Item	测试条件 Test condition	测试仪器 Test equipment
电感量 Ls	100kHz/1V	HP4263B\IM3532-50 or equivalent
直流电阻 RDC	直流电 direct-current	HP4263B\RM3545 or equivalent
饱和电流 Isat	100kHz/1V	Microtest 6379 & 6220 or equivalent
温升电流 Irms	ambient temperature 20℃	Microtest 6379 & 6220 or equivalent

MRS3015-S00 series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		饱和电流 Isat (A)	温升电流 I _{rms} (A)	印字 Marking
	Nominal value	Tol.			Max.	Max.	
MRS3015-R22NTS00	0.22	30%	0.020	Max	8.80	5.20	•22
MRS3015-R33NTS00	0.33		0.025	Max	8.00	5.00	•33
MRS3015-R47NTS00	0.47		0.030	Max	7.60	4.60	•47
MRS3015-R68NTS00	0.68		0.040	Max	7.00	4.00	•68
MRS3015-1R0_TS00	1.00	N: ±30% M: ±20%	0.050	Max	5.80	3.50	1.0
MRS3015-1R5_TS00	1.50		0.080	Max	4.60	2.20	1.5
MRS3015-2R2_TS00	2.20		0.100	Max	3.70	2.20	2.2
MRS3015-3R3_TS00	3.30		0.150	Max	3.40	2.00	3.3
MRS3015-4R7_TS00	4.70		0.200	Max	2.50	1.70	4.7
MRS3015-6R8_TS00	6.80		0.330	Max	2.00	1.20	6.8
MRS3015-100_TS00	10.00		0.470	Max	1.60	1.10	10

Isat: 指使电感量比初始值下降约 30%的电流值, 加载电流的时间 1 秒以内。

The DC current at which the inductance drops approximate 30% from its value without current, Load current time within 1 s.

I_{rms}: 指使电感器表面温度上升 40℃的电流值。

The DC current is inductor surface temperature to rise by 40℃.

额定工作使用电压: DC25V

Rated working voltage: DC25

项目 Item	测试条件 Test condition	测试仪器 Test equipment
电感量 Ls	100KHz/500mV	HP4263B\IM3532-50 or equivalent
直流电阻 RDC	直流电 direct-current	HP4263B\IRM3545 or equivalent
饱和电流 Isat	100KHz/500mV	Microtest 6379 & 6220 or equivalent
温升电流 I _{rms}	ambient temperature 20℃	Microtest 6379 & 6220 or equivalent

MRS4020-S00 series

型号 Part NO	电感量 Ls (μH)		直流电阻 RDC (Ω)		饱和电流 Isat (A)	温升电流 Irms (A)	印字 Marking
	Nominal value	Tol.			Max.	Max.	
MRS4020-1R0_TS00	1.00	N: ± 30% M: ± 20%	0.031	MAX	8.70	5.20	1R0
MRS4020-2R2_TS00	2.20		0.0576	MAX	6.10	3.30	2R2
MRS4020-4R7_TS00	4.70		0.130	MAX	4.00	2.00	4R7
MRS4020-100_TS00	10.00		0.234	MAX	2.80	1.60	100

Isat: 指使电感量比初始值下降约 30%的电流值，加载电流的时间 1 秒以内。

The DC current at which the inductance drops approximate 30% from its value without current, Load current time within 1 s.

Irms: 指使电感器表面温度上升 40℃的电流值。

The DC current is inductor surface temperature to rise by 40℃.

额定工作使用电压: DC25V

Rated working voltage: DC25V

项目 Item	测试条件 Test condition	测试仪器 Test equipment
电感量 Ls	100KHz/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	100KHz/500mV	Microtest 6379 & 6220 or equivalent
温升电流 Irms	ambient temperature 20℃	Microtest 6379 & 6220 or equivalent

◆可靠性测试方法
Reliability Test Method

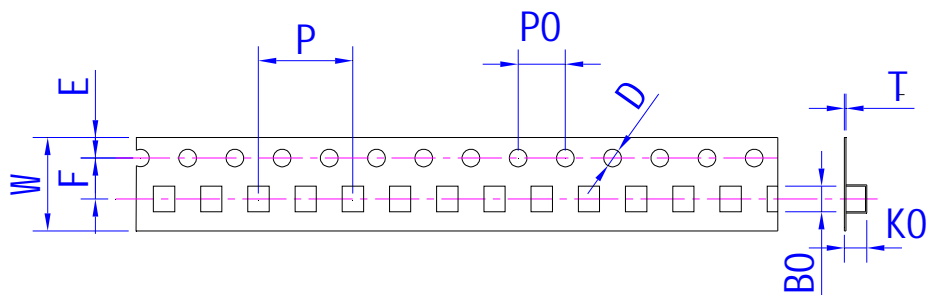
序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks
1	绝缘电阻 Insulation Resistance	$\geq 1M\Omega$	在电感器线圈和磁芯之间施加 25 V 直流电压保持 3s。 25 V DC between inductor coil and core for 3 seconds.
2	可焊性 Solderability	电极面 95%以上覆盖新的焊料。 95% or more of electrode area shall be coated by new solder.	在 245 °C \pm 3 °C 熔 融 的 焊 锡 (96.5Sn/3.0Ag/0.5Cu) 中浸 3 s \pm 0.3 s。 Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at 245 °C \pm 3 °C for (3 \pm 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 °C \pm 5 °C 熔 融 的 焊 锡 (96.5Sn/3.0Ag/0.5Cu) 中浸 10 s \pm 1 s。 Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at 260°C \pm 5 °C for (10 \pm 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 °C \pm 5 °C, 20 s \pm 5 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 s \pm 1 s。 Inductors shall be subjected to 260 °C \pm 5 °C for 20 s \pm 5 s Soldering in the base whit 0.3mm solder. And then aplomb electrode way plus tax 10 N for 10 \pm 1s 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 °C \pm 2 °C, 时间 1000+24 0h, 在室 温下放置 2 小时后、48 小时内测试。Temperature 125 °C \pm 2 °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 °C \pm 2 °C, 时间 1000+24 0h; 在室 温下放置 2 小时后、48 小时内测试。 Temperature -40 °C \pm 2 °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.

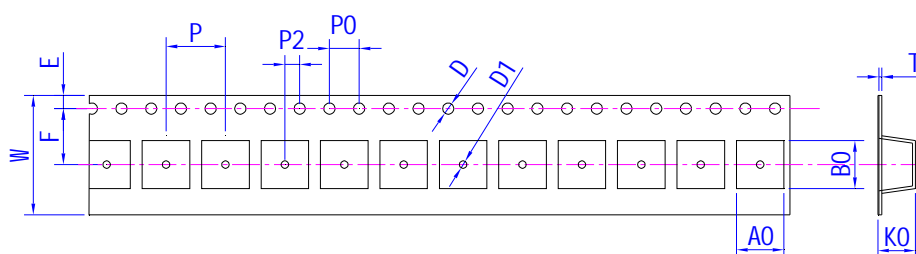
◆包装
Packaging
● 载带尺寸 (单位: mm)

Taping Dimension(Unit: mm)

MRS2512-Y00 series



MRS3015-S00、MRS4020-S00 series

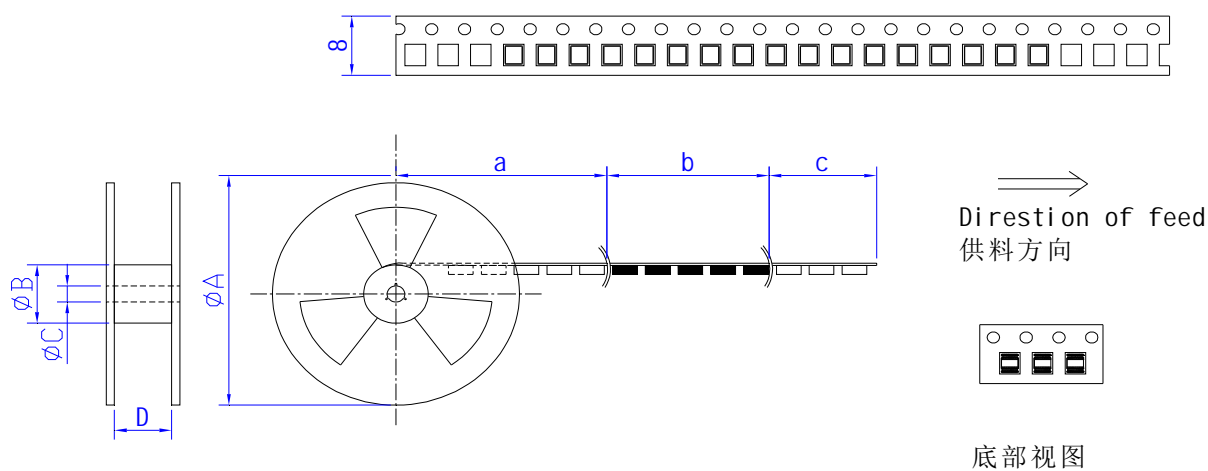


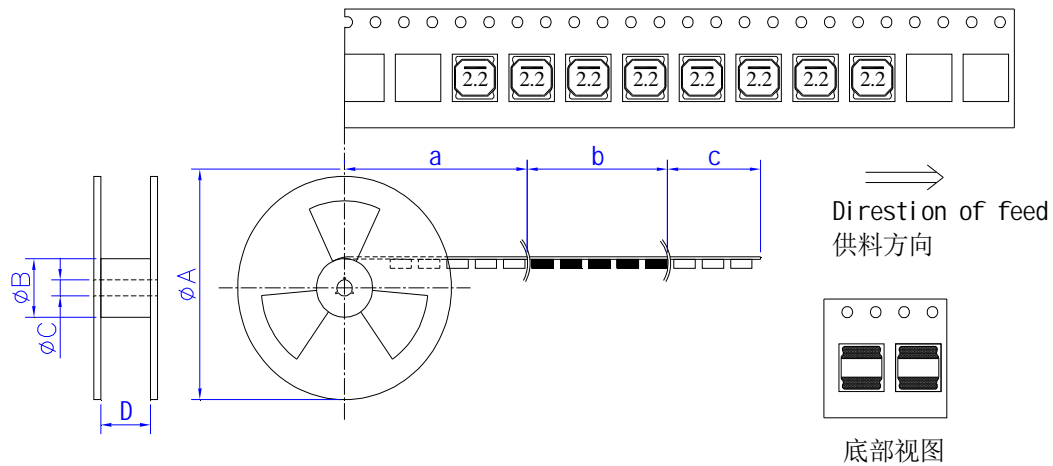
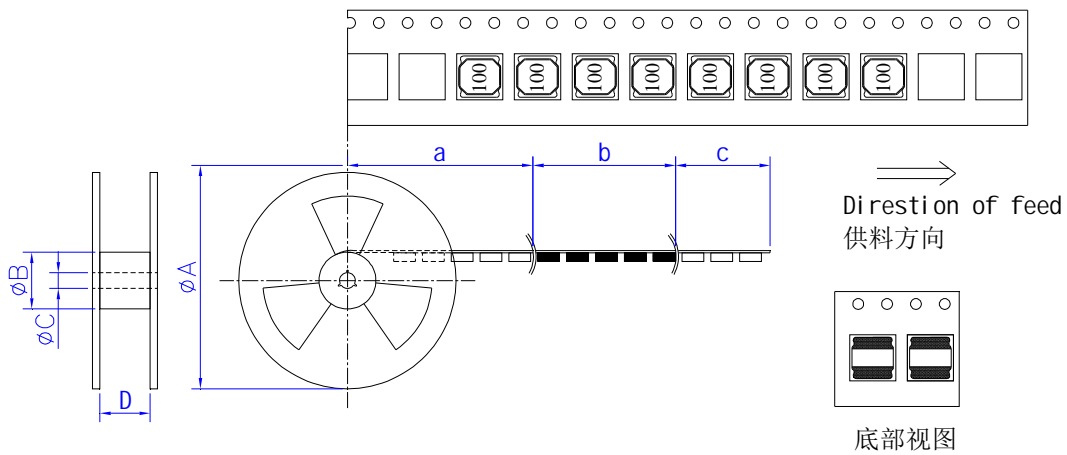
系列 Series	W	A0	B0	D	D1	E	F	K0	P0	P2	P	T
2512	8.0±0.3	2.4±0.2	2.65±0.2	1.5±0.2	---	1.75±0.2	3.5±0.2	1.4±0.2	4.0±0.2	2.0±0.2	4.0±0.3	0.25±0.05
3015	8.0±0.3	3.3±0.1	3.3±0.1	1.5±0.1	---	1.75±0.1	3.5±0.1	1.9±0.1	4.0±0.1	2.0±0.1	4.0±0.1	0.25±0.10
4020	12.0±0.5	4.3±0.3	4.3±0.3	1.5±0.3	---	1.75±0.3	5.5±0.3	2.1±0.3	4.0±0.3	2.0±0.3	8.0±0.3	0.30±0.10

● 卷盘尺寸及产品方向(单位: mm)

Reel dimensions and products direction (Unit: mm)

MRS2512-Y00 series

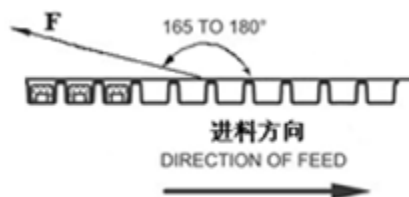


MRS3015-S00 series

MRS4020-S00 series


Series	A	B	C	D	a	b	c
2512	178 typ.	58 typ.	13 typ.	8.4 typ.	空带 Blank portions	装元件 Chip cavity	引带 Leader
3015	178 typ.	58 typ.	13 typ.	8.4 typ.	空带 Blank portions	装元件 Chip cavity	引带 Leader
4020	330 typ.	100 typ.	13 typ.	12.4 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	2512	3015	4020
每卷数量 REEL	2000	2000	3000
每盒数量 BOX	10000	10000	15000
每箱数量 CASE	100000	100000	45000

● 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

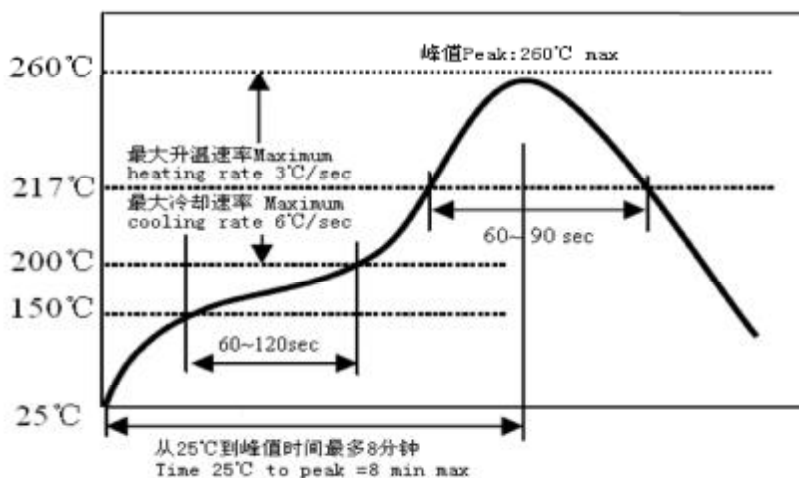
焊料: Sn-3.0Ag-0.5Cu

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 ~ 120 sec
- (2) 允许大于 217°C 时间: 60 ~ 90 秒;
Allowed time above 217°C: 60 ~ 90 sec
- (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

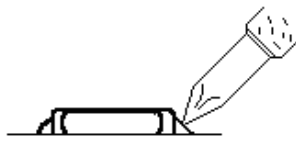
Perform soldering at 350°C.

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	2025-7-16	更新模版格式 Update the template format.	王志聪

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