

应用于大电流的小尺寸绕线铁粉芯功率电感

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概要

绕线铁粉芯功率电感SWPN系列，采用以铁系材料为基础的金属磁粉工字型磁芯，180度耐温等级漆包铜线绕制，并以磁性胶水涂敷形成屏蔽结构。该产品较铁氧体功率电感具有更高的饱和电流、更低的直流电阻，特别适用于对电流需求越来越高的便携式设备，如智能手机、平板电脑等。

背景和开发目的

伴随着以智能手机为代表的小型便携式设备的小型薄型化、高性能化和多功能化发展趋势，在电源转换线路中起储能、扼流关键作用的功率电感，其小型低背化、同时高耐电流特性的需求也在增加。目前常用的铁氧体功率电感已开始不能满足多核、大屏、超薄、多功能智能手机的需求。

铁系金属粉磁性材料具有较高的磁饱和特性，采用模压工艺可制备尺寸6mm以上的超大电流电感，一直在电脑中使用。通过对该材料的成份配比、粒径优化以及预处理，经过压制烧结而成的铁粉磁芯，一方面颗粒表面会形成一层高结晶复合材料氧化层，该氧化层可以使磁芯具有较高的抗冲击能力、绝缘性；另一方面该磁芯的密度更接近理论值，相比模压工艺而言具有更高的磁导率，可以实现更小的直流电阻。

SWPN系列功率电感正是采用了这种铁系金属粉磁芯制作而成，饱和电流特性相比铁氧体电感有巨大提升，同时电感的综合性能指标都有显著提高，可以很好满足设备厂商对器件性能的要求。同时，SWPN系列功率电感的制造平台和SWPA系列功率电感相同，是全自动化生产线，保证充足产能的同时保证了产品质量的稳定性和一致性。

产品特点 铁粉芯磁芯比铁氧体材质具有更高的饱和电

流 直流电阻小，功耗低 磁性胶水涂敷形成闭合磁路结构减少漏磁 磁芯金属化电极不脱落，抗跌落冲击能力强 尺寸小，高度薄，省空间 全自动化生产平台，保证产品性能和一致性

应用

智能手机 平板电脑、笔记本电脑、台式电脑、服务器 蓝光 DVD、机顶盒 便携式游戏机、个人导航系统、多媒体系统

Wire Wound SMD Power Inductors – SWPN Series

Operating Temp. : -40℃~+125℃ (Including self-heating)



FEATURES

- z Soft magnetic metal core results in high rated current
- z Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
- z Metallization on metal core results in excellent shock resistance and damage-free durability
- z Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- z Takes up less PCB real estate and save more power

APPLICATIONS

- z Smart phones
- z Tablet PCs, notebooks, desktop computers, servers
- z Blue-ray disc recorders, set top boxes
- z Portable gaming device, personal navigation systems, personal multimedia devices

PRODUCT IDENTIFICATION

SWPN

①

① Type	
SWPN	Metal Core Wire Wound SMD Power Inductor

201610

②

② External Dimensions (L×W×H) [mm]	
201610	2.0×1.6×1.0
252010	2.5×2.0×1.0

H

③

③ Material Code	
H	H Type Material

2R2

④

④ Nominal Inductance	
Example	Nominal Value
2R2	2.2μH

M

⑤

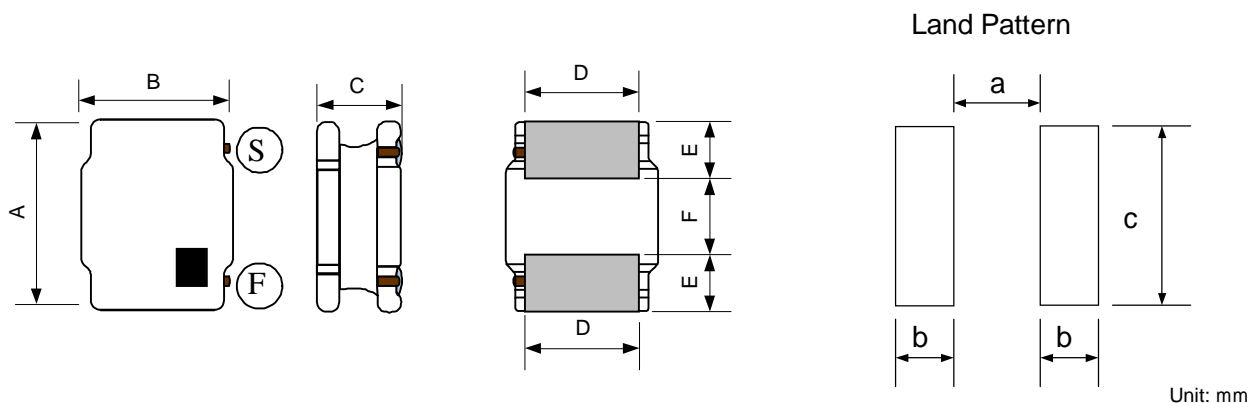
⑤ Inductance Tolerance	
N	±30%
M	±20%

T

⑥

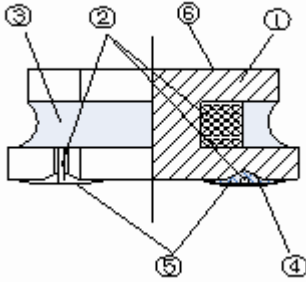
⑥ Packing	
T	Tape & Reel

SHAPE AND DIMENSIONS



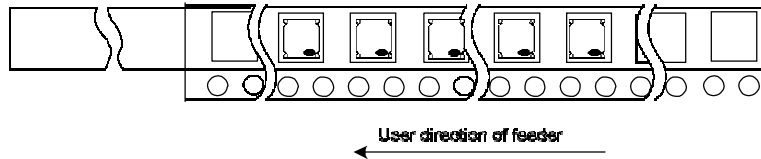
Series	A	B	C Max.	D	E	F	a Typ.	b Typ.	c Typ.
SWPN201610H	2.0±0.2	1.6±0.2	1.0	1.2±0.2	0.60±0.2	0.80±0.2	0.65	0.70	1.60
SWPN252010H	2.5±0.2	2.0±0.2	1.0	1.5±0.2	0.80±0.2	0.80±0.2	0.80	0.85	2.00

STRUCTURE



No.	Components	Material
①	Core	Soft magnetic Metal
②	Wire	Polyurethane system enameled copper wire
③	Magnetic Glue	Epoxy resin and magnetic powder
④	Substrate	FeNiCu/Ag
⑤	Top Electrodes	Sn alloy
⑥	Marking	Ink

DIRECTION of ROLLING



SPECIFICATIONS

SWPN201610H Series ([Developing product specifications for reference](#))

Part Number	Inductance @1MHz	DC Resistance		Saturation Current		Heat Rating Current	
		Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
SWPN201610HR24M	0.24 \pm 20%	0.040	0.033	4.50	5.50	3.00	3.45
SWPN201610HR47M	0.47 \pm 20%	0.049	0.041	4.00	4.70	2.70	3.10
SWPN201610HR68M	0.68 \pm 20%	0.065	0.057	3.45	4.00	2.45	2.80
SWPN201610H1R0M	1.00 \pm 20%	0.090	0.075	3.35	3.85	2.05	2.35
SWPN201610H2R2M	2.2 \pm 20%	0.170	0.142	1.90	2.15	1.45	1.70
SWPN201610H100M	2.2 \pm 20%	0.826	0.688	0.80	0.95	0.65	0.75

SWPN252010H Series ([Developing product specifications for reference](#))

Part Number	Inductance @1MHz	DC Resistance		Saturation Current		Heat Rating Current	
		Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
SWPN252010HR47M	0.47 \pm 20%	0.047	0.039	4.80	5.40	3.10	3.70
SWPN252010HR68M	0.68 \pm 20%	0.062	0.052	3.50	4.10	2.70	3.20
SWPN252010H1R0M	1.00 \pm 20%	0.078	0.065	2.90	3.40	2.40	2.90
SWPN252010H1R5M	1.50 \pm 20%	0.101	0.084	2.60	3.10	2.00	2.30
SWPN252010H2R2M	2.20 \pm 20%	0.161	0.134	1.90	2.20	1.50	1.80
SWPN252010H3R3M	3.30 \pm 20%	0.235	0.196	1.60	1.90	1.20	1.40
SWPN252010H4R7M	4.70 \pm 20%	0.276	0.230	1.40	1.70	1.10	1.30
SWPN252010H100M	10 \pm 20%	0.492	0.410	0.90	1.00	0.82	0.97

Note1: Inductance with tolerance of $\pm 20\%$ or other value is also available. Please contact your local sales.

※1: All test data is referenced to 20°C ambient;

※2: Rated current: Isat or Irms, whichever is smaller;

※3: Isat: DC current at which the inductance drops approximate 30% from its value without current;

※4: Irms: DC current that causes the temperature rise ($\Delta T = 40^\circ\text{C}$) from 20°C ambient.

The part temperature (ambient + temp. rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

Note2: Series Product stays in sample stage.

SUNTEK

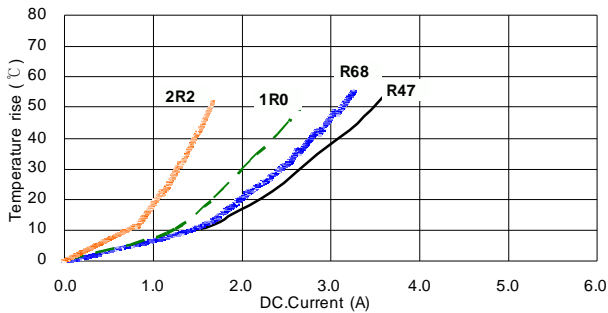
Specifications subject to change without notice. Please check our website for latest information. Revised 2012/06/20

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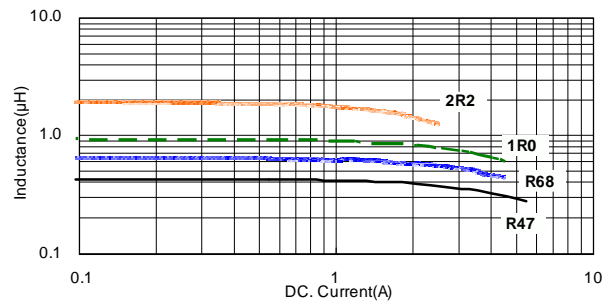
TYPICAL ELECTRICAL CHARACTERISTICS

SWPN201610H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



PACKAGING

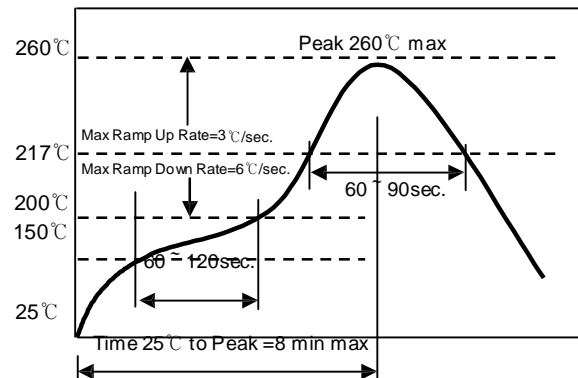
Type	Tape Width	Reel Diameter	Quantity (pcs)
201610	8mm	178mm	2K
252010	8mm	178mm	2K

RECOMMENDED SOLDERING TECHNOLOGIES

● Re-flowing Profile:

- △ Preheat condition: 150 ~200°C /60~120sec.
- △ Allowed time above 217°C: 60~90sec.
- △ Max temp: 260°C
- △ Max time at max temp: 10sec.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Allowed Reflow time: 2x max

[Note: The reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer's specific board design, solder paste and process, and should not exceed the parameters as the Reflow profile shows.]



● Iron Soldering Profile.

- △ Iron soldering power: Max.30W
- △ Pre-heating: 150 °C/60 sec.
- △ Soldering Tip temperature: 350°C Max.
- △ Soldering time: 3sec Max.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Max.1 times for iron soldering

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]

