SPECIFICATIONS

Customer	
Product Name	**Wire Wound SMD Power Inductor**
Sunlord Part Number	**SWPA4020S☐☐☐☐T**
Customer Part Number	

[☒New Released, ☐Revised] **SPEC No.: SWPA110000**

Rev.	Effective Date	Changed Contents	Change reasons	Approved By
01	/	New release	/	Yabing Yang

【This SPEC is total 7 pages including specifications and appendix.】

【ROHS Compliant Parts】

Approved By	Checked By	Issued By

Shenzhen Sunlord Electronics Co., Ltd.

Address: Sunlord Industrial Park, Dafuyuan Industrial Zone, Baoan, Shenzhen, China 518110
Tel: 0086-755-29832660 Fax: 0086-755-82269029 E-Mail: sunlord@sunlordinc.com

【For Customer approval Only】 Date:_____

Qualification Status: ☐ Full ☐ Restricted ☐ Rejected

Approved By	Verified By	Re-checked By	Checked By

Comments:

_____

1. Scope

This specification applies to the SWPA4020S☐☐☐☐T of wire wound SMD power inductor.

2. Product Description and Identification (Part Number)

1) Description

Wire wound SMD power inductor SWPA4020S, XXXμH± X%, XXXΩ±30%, XXX A

2) Product Identification (Part Number)

SWPA 4020 S ☐☐☐ ☐ T

① ② ③ ④ ⑤ ⑥

① Type	
SWPA	Wire wound SMD power inductor

② External Dimensions(L×H) [mm]	
4020	4.0 X 2.0

④ Nominal Inductance	
Example	Nominal Value
1R0	1μH
100	10μH
101	100μH

③ Feature type	
S	Standard

⑥ Packing	
T	Tape Carrier Package

⑤ Inductance Tolerance	
N	±30%
M	±20%

3. Electrical Characteristics

Please refer to **Appendix A** (Page 7).

1) Operating temperature range: -25℃ to +120℃(Including self-heating)

2) Storage temperature range (packaging conditions): -10℃~+40℃ and RH 70% (Max.)

4. Shape and Dimensions

1) Choke body:

Ferrite body for SWPA4020S series

2) Dimensions: See **Fig. 4-1**, **Fig. 4-2**.

Recommended Land Patterns: See **Fig. 4-3**

Unit: mm

Tolerance:±0.3

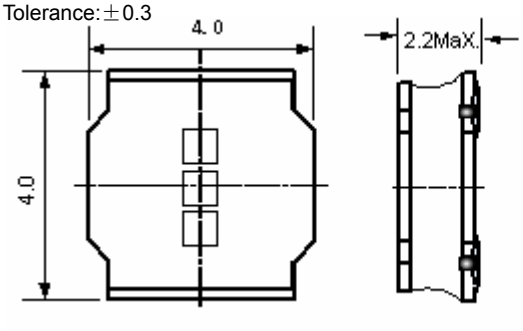


Fig. 4-1

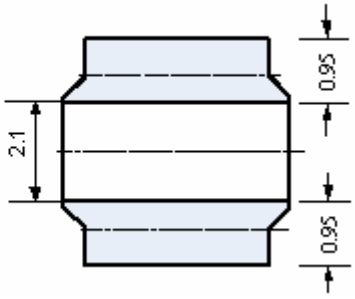


Fig. 4-2

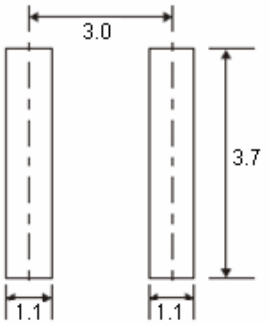
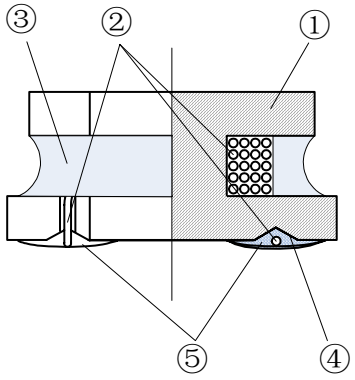


Fig. 4-3

3) Structure: See **Fig. 4-4**.



No.	Components	Material
①	Ferrite Core	Ni-Zn Ferrite
②	Wire	Polyurethane system enameled copper wire
③	Magnetic Glue	Epoxy resin and magnetic powder
④	Plating Electrodes	Plating :Ag 10-20μm Ni 1-3μm Sn 3-7μm
⑤	Outer Electrodes	Top surface solder coating Sn96.5%、Ag3%、Cu0.5% 350μm Typ. thickness

Fig. 4-4

5. Test and Measurement Procedures

5.1 Test Conditions

5.1.1 Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

a. Ambient Temperature: 20±15℃
b. Relative Humidity: 65%±20%
c. Air Pressure: 86KPa to 106KPa

5.1.2 If any doubt on the results, measurements/tests should be made within the following limits:

a. Ambient Temperature: 20±2℃
b. Relative Humidity: 65%±5%
c. Air Pressure: 86KPa to 106KPa

5.2 Visual Examination

a. Inspection Equipment: 10X magnifier

5.3 Electrical Test

5.3.1 Inductance (L)

a. Refer to **Appendix A**.
b. Test equipment: ZM2355 LCR meter or equivalent.
c. Test Frequency and Voltage: refers to **Appendix A**

5.3.2 Direct Current Resistance (DCR)

a. Refer to **Appendix A**
b. Test equipment: HIOKI 3540 or equivalent.

5.3.3 Saturation Current (Isat)

a. Refer to **Appendix A**
b. Test equipment: Saturation current meter
c. Definition of saturation current (Isat): DC current at which the inductance drops approximate 30% from its value without current.

5.3.4 Temperature rise current (Irms)

a. Refer to **Appendix A**.
b. Test equipment (see **Fig.5.3.4-1**): Electric Power, Electric current meter, Thermometer.
c. Measurement method (see **Fig. 5.3.4-1**):
   1. Set test current to be 0mA.
   2. Measure initial temperature of choke surface.
   3. Gradually increase current and measure choke temperature for corresponding current.
   4. Definition of Temperature rise current: DC current that causes the temperature rise (△T =40°C) from 20°C ambient (see **Fig. 5.3.4-2**).

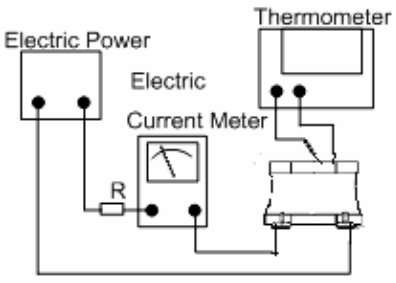


Fig. 5.3.4-1

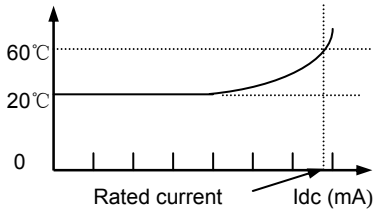
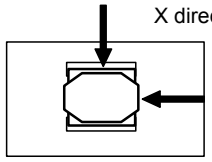
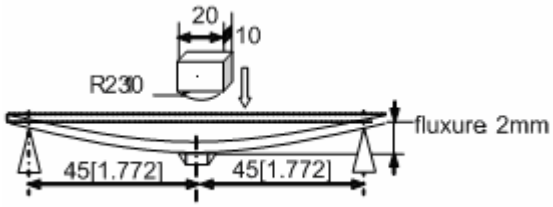
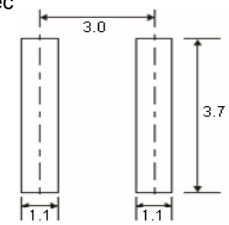
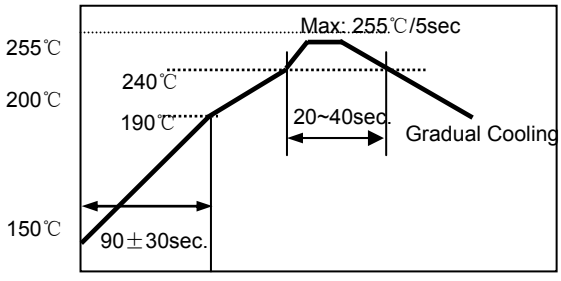
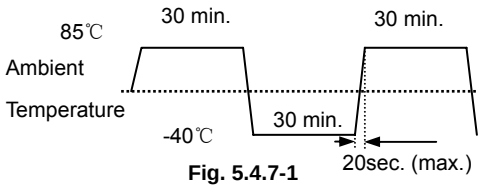


Fig. 5.3.4-2

5.4 Reliability Test

Items	Requirements	Test Methods and Remarks
5.4.1 Terminal Strength	No removal or split of the termination or other defects shall occur.  **Fig.5.4.1-1**	① Solder the inductor to the testing jig (glass epoxy board shown in **Fig.5.4.1-1**) using eutectic solder. Then apply a force in the direction of the arrow. ② 10N force. ③ Keep time: 5s
5.4.2 Resistance to Flexure	No visible mechanical damage.  **Fig. 5.4.2-1**	① Solder the chip to the test jig (glass epoxy board) using eutectic solder. Then apply a force in the direction shown as **Fig.5.4.2-1**. ② Flexure: 2mm ③ Pressurizing Speed: 0.5mm/sec ④ Keep time: 30±1s ⑤ Test board size: 100X40X1.0 ⑥ Land dimension:  Unit :mm
5.4.3 Vibration	① No visible mechanical damage. ② Inductance change: Within ±10%	① Solder the chip to the testing jig (glass epoxy board shown as the following figure) using eutectic solder. ② The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz. ③ The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3mutually perpendicular directions (total of 6 hours).
5.4.4 Temperature coefficient	Inductance change: Within ±20%	① Temperature: -25℃~+85℃ ② With a reference value of +20℃, change rate shall be calculated
5.4.5 Solderability	90% or more of electrode area shall be Coated by new solder.	① The test samples shall be dipped in flux, and then immersed in molten solder. ② Solder temperature: 245±5℃ ③ Duration: 5±1 sec. ④ Solder: Sn/3.0Ag/0.5Cu ⑤ Flux: 25% resin and 75% ethanol in weight ⑥ Immersion depth: all sides of mounting terminal shall be immersed
5.4.6 Resistance to Soldering Heat	① No visible mechanical damage. ② Inductance change: Within ±10%	① Re-flowing Profile: Please refer to **Fig. 5.4.6-1** ② Test board thickness: 1.0mm ③ Test board material: glass epoxy resin ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring  **Fig. 5.4.6-1**

5.4.7 Thermal Shock	① No visible mechanical damage. ② Inductance change: Within ±10%  **Fig. 5.4.7-1**	① Temperature and time: -40±3℃ for 30±3 min→85℃ for 30±3min ② Transforming interval: Max. 20 sec ③ Tested cycle: 10 cycles ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring
5.4.8 Resistance to Low Temperature	① No mechanical damage. ② Inductance change: Within ±10%	① Temperature: -40±3℃ ② Duration: $1000^{\pm 24}$ hours ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring
5.4.9 Resistance to High Temperature	① No mechanical damage. ② Inductance change: Within ±10%	① Temperature: 85±2℃ ② Duration: $1000^{\pm 24}$ hours ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.10 Damp Heat	① No mechanical damage. ② Inductance change: Within ±10%	① Temperature: 60±2℃ ② Humidity: 90% to 95%RH ③ Duration: $1000^{\pm 24}$ hours ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring
5.4.11 Loading Under Damp Heat	① No mechanical damage. ② Inductance change: Within ±10%	① Temperature: 60±2℃ ② Humidity: 90% to 95% RH ③ Applied current: Irms ④ Duration: $1000^{\pm 24}$ hours ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring
5.4.12 Loading at High Temperature	① No mechanical damage. ② Inductance change: Within ±10%	① Temperature: 85±2℃ ② Applied current: Irms ③ Duration: $1000^{\pm 24}$ hours ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring

6. Packaging and Storage

6.1 Packaging

There is one type of packaging for the chip inductors. Please specify the packing code when ordering.

Tape Carrier Packaging:

Packaging code: T

a. Tape carrier packaging are specified in attached figure **Fig.6.1-1~3**

b. Tape carrier packaging quantity please see the following table:

Type	SWPA4020S
Tape	Embossed Tape
Quantity	3.0K

(1) Taping Drawings (Unit: mm)

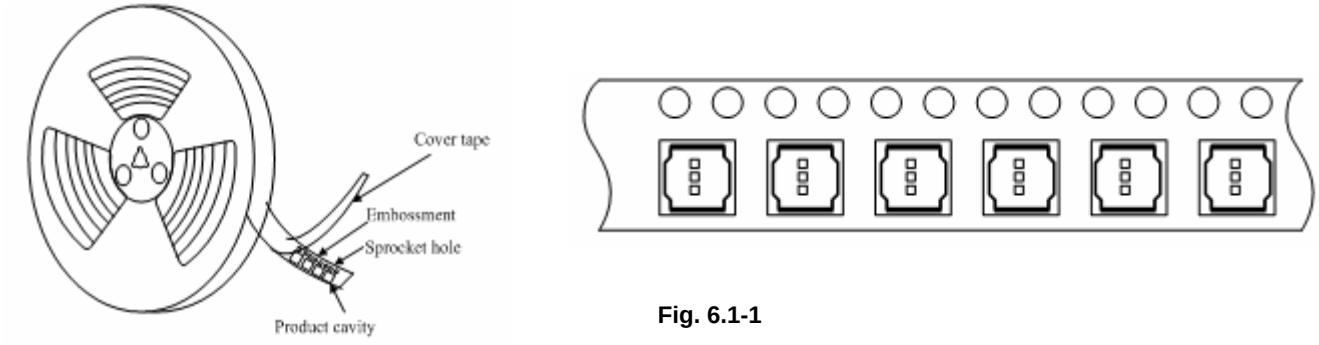


Fig. 6.1-1

(2) Taping Dimensions (Unit: mm)

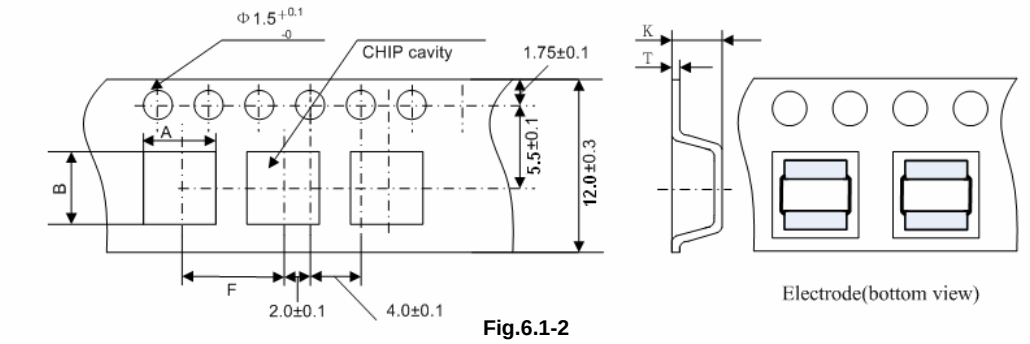


Fig.6.1-2

Type	A	B	F	K.	T
SWPA4020S	4.40±0.10	4.40±0.10	8.0±0.10	2.4±0.10	0.30±0.03

(3) Reel Dimensions (Unit: mm)

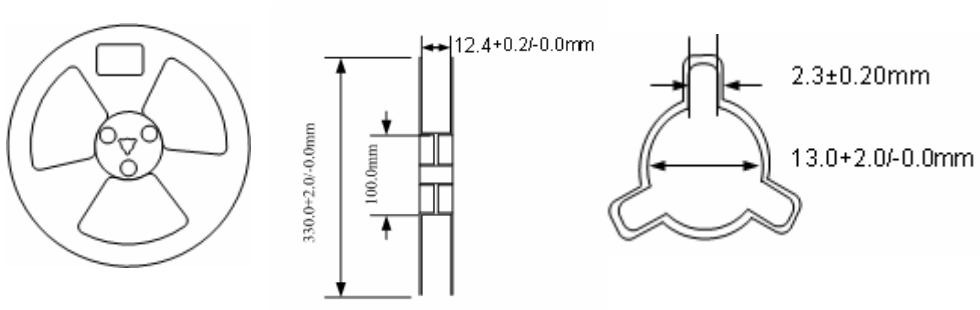


Fig. 6.1-3

6.2 Storage

a. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.

b. Recommended conditions: -10℃~40℃, 70%RH (Max.)

c. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, product should be used with one year from the time of delivery.

d. In case of storage over 6 months, solderability shall be checked before actual usage.

7. Recommended Soldering Technologies

7.1 Re-flowing Profile:

△ 1~2 ℃/sec. Ramp

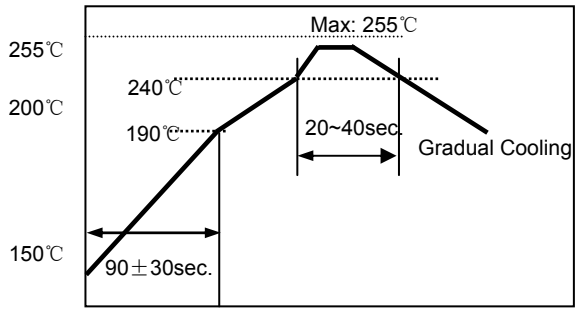
△ Pre-heating: 150~190℃/90±30 sec.

△ Time above 240℃: 20~40sec

△ Peak temperature: 255℃ Max./5sec;

△ Solder paste: Sn/3.0Ag/0.5Cu

△ Max.2 times for Re-flowing



7.2 Iron Soldering Profile:

△ Iron soldering power: Max.30W

△ Pre-heating: 150℃/60sec.

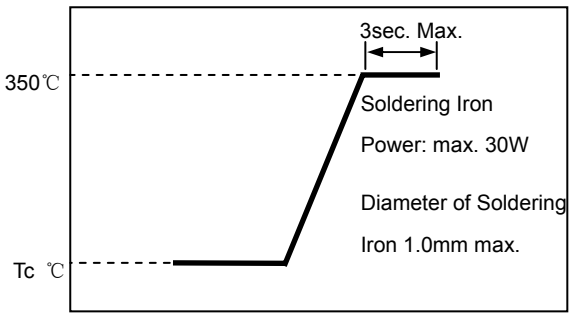
△ Soldering Tip temperature: 350℃Max.

△ 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.]



8. Supplier Information

a) Supplier:

Shenzhen Sunlord Electronics Co., Ltd.

b) Manufacturer:

Shenzhen Sunlord Electronics Co., Ltd.

c) Manufacturing Address:

Sunlord Industrial Park, Dafuyuan Industrial Zone, Guanlan, Shenzhen, China

Zip: 518110

Appendix A: Electrical Characteristics

I. SWPA4020S Series of Power Inductor

Part Number	Inductance	L Tolerance	Inductance Test Condition	DC Resistance (±30%)	Saturation Current	Temperature Rise Current	Min. Self-resonant frequency	Marking
Units	μH	-	-	Ω	A	A	MHz	-
Symbol	L	-	-	DCR	Isat	Irms	SRF	-
SWPA4020S1R0NT	1.0	±30%	100KHz,1V	0.029	4.85	2.15	75	1R0
SWPA4020S1R2NT	1.2	±30%	100KHz,1V	0.029	5.10	2.15	72	1R2
SWPA4020S1R5NT	1.5	±30%	100KHz,1V	0.035	4.45	1.98	71	1R5
SWPA4020S2R2NT	2.2	±30%	100KHz,1V	0.040	3.40	1.85	49	2R2
SWPA4020S3R3MT	3.3	±20%	100KHz,1V	0.070	3.20	1.40	44	3R3
SWPA4020S3R6MT	3.6	±20%	100KHz,1V	0.055	2.80	1.54	49	3R6
SWPA4020S4R7MT	4.7	±20%	100KHz,1V	0.075	2.35	1.34	42	4R7
SWPA4020S5R1MT	5.1	±20%	100KHz,1V	0.085	2.30	1.27	42	5R1
SWPA4020S5R6MT	5.6	±20%	100KHz,1V	0.090	2.20	1.22	30	5R6
SWPA4020S6R2MT	6.2	±20%	100KHz,1V	0.115	2.15	1.08	36	6R2
SWPA4020S6R8MT	6.8	±20%	100KHz,1V	0.125	2.20	1.04	33	6R8
SWPA4020S7R5MT	7.5	±20%	100KHz,1V	0.115	1.85	1.08	30	7R5
SWPA4020S8R2MT	8.2	±20%	100KHz,1V	0.125	1.75	1.04	27	8R2
SWPA4020S100MT	10	±20%	100KHz,1V	0.165	1.60	0.90	26	100
SWPA4020S120MT	12	±20%	100KHz,1V	0.175	1.50	0.88	26	120
SWPA4020S150MT	15	±20%	100KHz,1V	0.230	1.35	0.77	24	150
SWPA4020S220MT	22	±20%	100KHz,1V	0.350	1.05	0.62	15	220
SWPA4020S270MT	27	±20%	100KHz,1V	0.545	1.02	0.50	14	270
SWPA4020S330MT	33	±20%	100KHz,1V	0.550	0.85	0.49	11	330
SWPA4020S390MT	39	±20%	100KHz,1V	0.650	0.82	0.46	11	390
SWPA4020S430MT	43	±20%	100KHz,1V	0.660	0.77	0.45	10	430
SWPA4020S470MT	47	±20%	100KHz,1V	0.710	0.74	0.44	10	470
SWPA4020S510MT	51	±20%	100KHz,1V	0.750	0.70	0.42	10	510
SWPA4020S560MT	56	±20%	100KHz,1V	0.800	0.66	0.41	10	560
SWPA4020S620MT	62	±20%	100KHz,1V	0.900	0.65	0.39	9.6	620
SWPA4020S680MT	68	±20%	100KHz,1V	1.060	0.61	0.36	7.7	680
SWPA4020S750MT	75	±20%	100KHz,1V	1.120	0.60	0.35	7.7	750
SWPA4020S820MT	82	±20%	100KHz,1V	1.170	0.56	0.34	7.2	820
SWPA4020S101MT	100	±20%	100KHz,1V	1.350	0.52	0.31	6.3	101