

SPECIFICATIONS

Customer	
Product Name	Assembled Wire Wound SMD Power Inductor
Sunlord Part Number	MWPQ2612 Series
Customer Part Number	
Weight	25.5g/Pcs ref.

New Released, Revised]

SPEC No.: **ES008-**

[This SPEC is total 11 pages.]

[ROHS Compliant Parts]

Approved By	Checked By	Issued By

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【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 MWPQ2612 Series of assembled wire wound SMD power inductor.

2 Product Description and Identification (Part Number)

1) Description:

MWPQ2612S series of assembled wire wound SMD power inductor.

2) Product Identification (Part Number)

MWPQ 2612 S □□□ □ I □□□
 ① ② ③ ④ ⑤ ⑥ ⑦

①	Type
MWPQ	Assembled Wire Wound SMD Power Inductor

②	External Dimensions(L×W×H) [mm]
2612	26X19X 12

③	Feature type
S	Standard Type

④	Nominal Inductance
Example	Example
1R5	1.5uH
100	10uH
101	100uH

⑤	Inductance Tolerance
K	±10%

⑥	Packing
P	Pallet

⑦	Special Process code
□□□	Special Process code
* Standard product is blank	

3 Electrical Characteristics

Please refer to **Item 6**.

- 1) Operating and storage temperature range (individual chip without packing): -40°C ~ +125°C (Including Self-heating)
- 2) Storage temperature range (packaging conditions): -10°C~+40°C and RH 70% (Max.)

4 Test and Measurement Procedures

4.1 Test Conditions

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

- a. Ambient Temperature: 20±15°C
- b. Relative Humidity: 65±20%
- c. Air Pressure: 86kPa to 106kPa

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

- a. Ambient Temperature: 20±2°C
- b. Relative Humidity: 65±5%
- c. Air Pressure: 86kPa to 106kPa

4.2 Visual Examination

Inspection Equipment: Visual or CCD.

4.3 Electrical Test

4.3.1 Inductance (L)

- a. Refer to **Item 6**. Test equipment: WK3260B LCR meter or equivalent.
- b. Test Frequency and Voltage: refers to **Item 6**.

4.3.2 Direct Current Resistance (DCR)

- a. Refer to **Item 6**.
- b. Test equipment: HIOKI 3540 or equivalent.

4.3.3 Saturation Current (Isat)

- a. Refer to **Item 6**.
- b. Test equipment: WK3260B LCR meter or equivalent.
- c. Definition of saturation current (Isat): DC current at which the inductance drops no more than 30% from its value without current.

4.3.4 Temperature rise current (Irms)

- a. Refer to **Item 6**.
- b. Test equipment (see **Fig. 4.3.4-1, Fig. 4.3.4-2**): Electric Power, Electric current meter, Thermometer.
- c. Measurement method
 - 1. Set test current to be 0 mA.
 - 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 from 25°C.

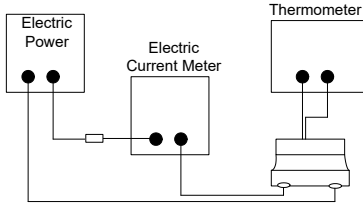


Fig. 4.3.4-1

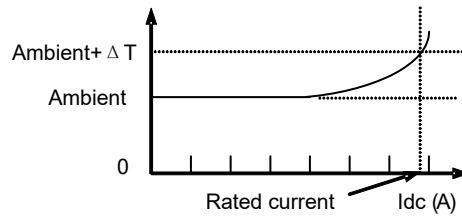


Fig. 4.3.42

5 Shape and Dimensions

Dimensions and recommended PCB pattern for reflow soldering, please see Fig.5-1, and Table 5-1.

Shape1: PN: MWPQ2612S1R5KPY01

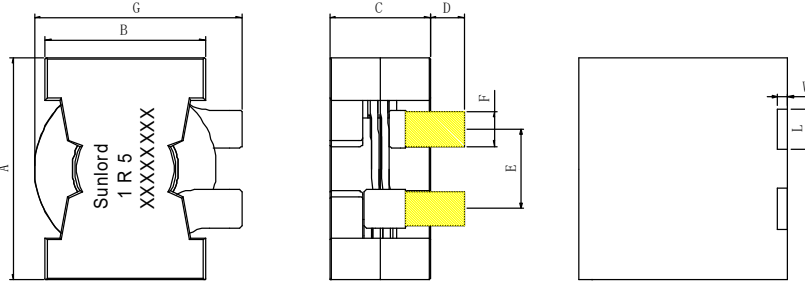


Fig.5-1

[Table 5-1] Unit: mm

Series	A	B	C	D	E	F	G	L ref.	W ref.
MWPQ2612S1R5KPY01	26.5 ±1.0	19 ±0.8	12 ±0.4	4.4 ±0.5	9 ±0.5	4.5 +0.1/-0.3	24.5 ±0.5	4.8	1.2

6 Electrical Characteristics

Part Number	@100KHz/1V	DC Resistance		Saturation Current	Heat Rating Current	Mark
		Max.	Typ.	30% drop	ΔT=40°C	
Units	μH	mΩ	mΩ	A	A	
Symbol	L	DCR		Isat	Irms	
MWPQ2612S1R5KPY01	1.5±10%	1.0	0.9	100	40	Refer to Item 8

Note: ※1: Rated current: Isat or Iirms, whichever is smaller;

※2: Saturation Current: DC current at which the inductance drops no more than 30% from its value without current;

※3 : Iirms: DC current that causes the temperature rise (ΔT) from 25°C, ΔT is no more than 40°C.

The part temperature (ambient + temp. rise) should not exceed 150 °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.

Test data of Electrical characteristics at 25 °C

Test data of Inductance VS DC Current and Temperature

Sample No.	L0(μH) 100KHz,1V	Isat ΔL/L ≤ 30%		DCR (mΩ) 25°C
		Isat(A)	L1(μH)	
1	1.50	100	1.20	0.88
2	1.52	100	1.19	0.89
3	1.41	100	1.25	0.88
4	1.48	100	1.21	0.90
5	1.52	100	1.20	0.88
Max	1.52		1.25	0.90
Min	1.41		1.19	0.88
AVERAGE	1.49		1.21	0.89

L (μH)	Temperature					
	Current(A)	25°C	-40°C	25°C	85°C	125°C
0		1.529	1.502	1.53	1.533	1.556
20		1.53	1.516	1.532	1.547	1.554
40		1.525	1.51	1.527	1.542	1.546
50		1520	1.506	1.522	1.536	1.534
60		1.512	1.499	1.514	1.521	1.502
70		1.496	1.488	1.499	1.488	1.359
80		1.464	1.472	1.47	1.386	0.745
90		1.395	1.445	1.409	0.924	0.456
100		1.25	1.4	1.256	0.6	

Test data of Inductance VS Frequency

F(KHz)	1	6	16.1	26.2	36.2	46.2	56	66.5	76.5	86.5	96.5
L(μ H)	1.67	1.5835	1.5478	1.5326	1.5246	1.5178	1.5138	1.51	1.5072	1.506	1.5046
F(KHz)	101	202	302	402	505	600	700	800	900	950	1000
L(μ H)	1.5038	1.4948	1.492	1.4824	1.4785	1.475	1.474	1.475	1.478	1.48	1.482

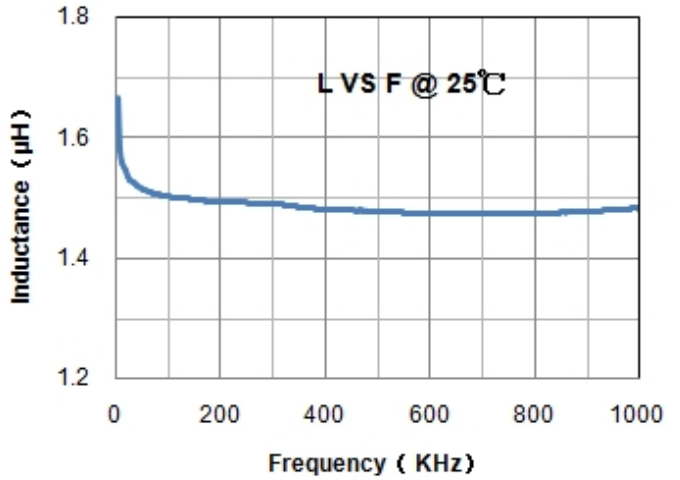
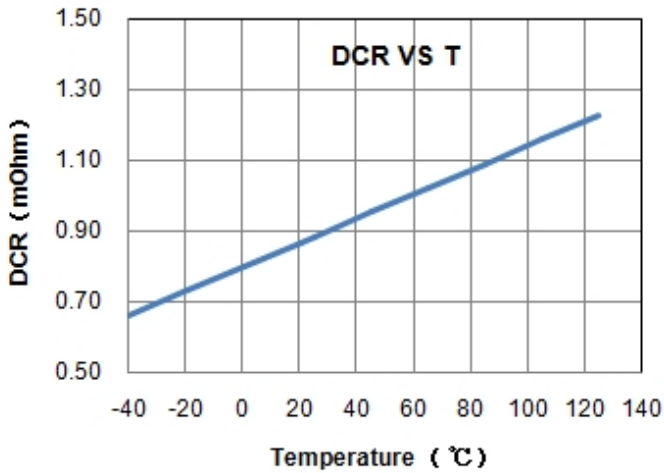
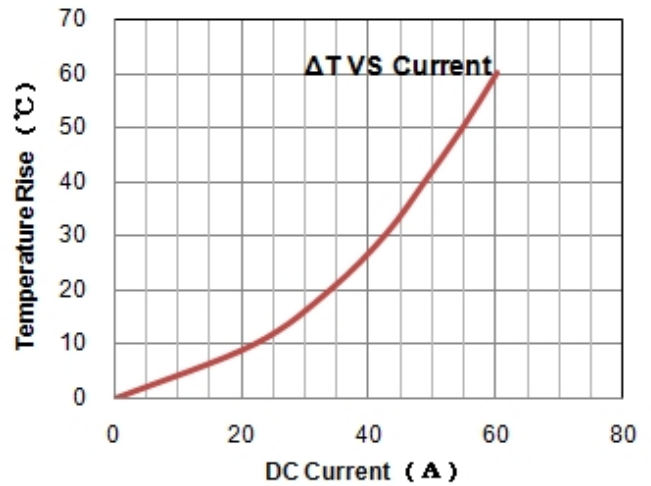
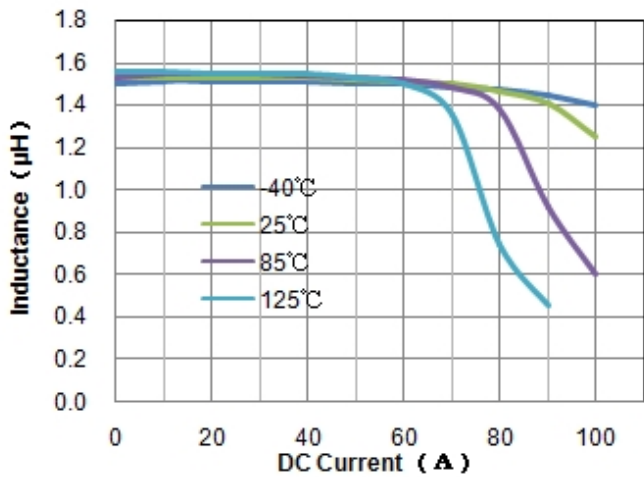
Test data of DCR VS Temperature

温度 ($^{\circ}$ C)	-40	-20	0	20	25	45	65	85	105	125
DCR (m Ω)	0.663	0.731	0.799	0.868	0.885	0.953	1.022	1.09	1.159	1.227

Test data of Temperature VS DC current

电流 (A)	0	22	34	42.8	49	55	60.3
Δ T ($^{\circ}$ C)	0	10.04	20.12	30.42	40.27	50.23	60.13

Electrical characteristics curves



7 Structure

The structure of MWPQ2612S1R5KPY01 , please refer to Fig.7-1 and Table 7-1.

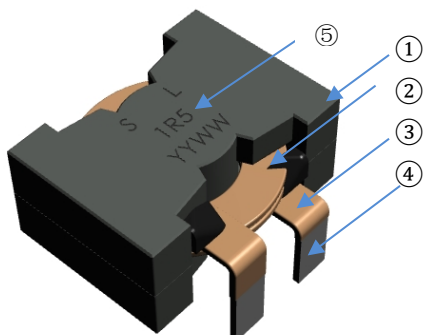


Fig.7-1

[Table 7-1]

No.	Components	Material
□	Core	MnZn Ferrite
□	Glue	Epoxy resin
□	Copper wire	Enamelled wire
□	Terminal	Cooper + Sn Alloy
⑤	Mark	Laser Marking

8 Product Marking

Please refer to Fig. 8-1.

Sunlord: Manufacturer, Sunlord

1R5: Inductance of the products

1752XXXX: Trace code

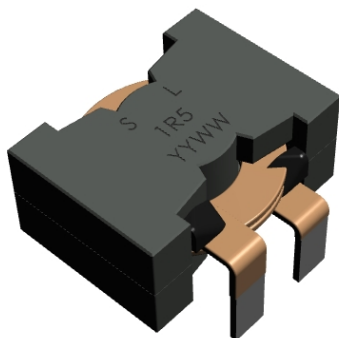


Fig. 8-1

9 Reliability Test

No.	Test Item	Test Method(According to AEC-Q200)	Requirements
1	Terminal Strength	8.9N, 5~10s.	No visible mechanical damage.
2	Temp. Characteristics	<input type="checkbox"/> Temperature: -40°C~+125°C <input type="checkbox"/> With a reference value of +20°C, change rate shall be calculated	Inductance change should be within ±20% of reference value measuring at 25°C, record the maximum, the minimum and the standard deviation value in different temperature.
3	Solderability	<input type="checkbox"/> The test samples shall be dipped in flux, and then immersed in molten solder. <input type="checkbox"/> Solder temperature: 245±5°C <input type="checkbox"/> Duration: 5±1 sec. <input type="checkbox"/> Solder: Sn/3.0Ag/0.5Cu <input type="checkbox"/> Flux: 25% resin and 75% ethanol in weight Immersion depth: all sides of mounting terminal shall be immersed	(1) No visible mechanical damage; (2) Wetting shall be exceeded 90% Coverage.
4	Vibration	<input type="checkbox"/> Solder the chip to the testing jig using eutectic solder. <input type="checkbox"/> 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. <input type="checkbox"/> 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 3 mutually perpendicular directions (total of 6 hours).	(1) No visible mechanical damage; (2) Inductance change: Within ±10%.
5	Loading Under High temperature	85±2°C, 1000(+24)hours, rated current.	
6	Loading Under Damp Heat	60±2°C, 90%~95%RH, 1000(+24)hours, rated current.	
7	Thermal Shock	-40°C/(30±3min), +125°C/(30±3min), transforming interval: 20s, 100 cycles.	
8	Resistance to Low Temperature	-40±2°C, 1000(+24) hours.	
9	Resistance to High Temperature	125±2°C, 1000(+24)hours.	
10	Biased Humidity	85°C, 85%RH, 1000(+24) h.	(1) No visible mechanical damage; (2) Inductance change: Within ±10%.
11	Flammability	Refer to UL94.	① t1 or t2: ≤10s; ② t1 plus t2 for the 5 specimens: ≤50s; ③ t2+t3 for each specimen: ≤30s; ④ No after-flame or after-glow of any specimen up to the holding clamp; ⑤ No cotton indicator ignited by flaming particles or drops.
12	solvent resistance	Method A: <input type="checkbox"/> 25% isopropyl alcohol and 75% mineral alcohol, 25±5°C, steeping 3(+0.5, 0)min; ② Brush the sample abeling , 0.57~0.85N, in the same direction, 3 cycles(10 times of 1 cycle, total of 30 times). Method B: ① 90% d-limonene and 10% surfactant, 25±5°C, steeping 3(+0.5, 0)min; <input type="checkbox"/> Brush the sample abeling , 0.57~0.85N, in the same direction, 3 cycles(10 times of 1 cycle, total of	No visible mechanical damage.

		30 times).	
		Method C: <ul style="list-style-type: none"><input type="checkbox"/> 42 deionized water, 1 propylene glycol and 1 monoethanolamine, 63~70°C,steeping 3(+0.5,0)min;<input type="checkbox"/> Brush the sample abeling,0.57~0.85N, in the same direction, 3 cycles(10 times of 1cycle,total of 30 times).	

10 Packaging and Storage

10.1 Packaging

Outer case cases (see **Fig. 10.1.1**):
 Size: 380*260*200mm

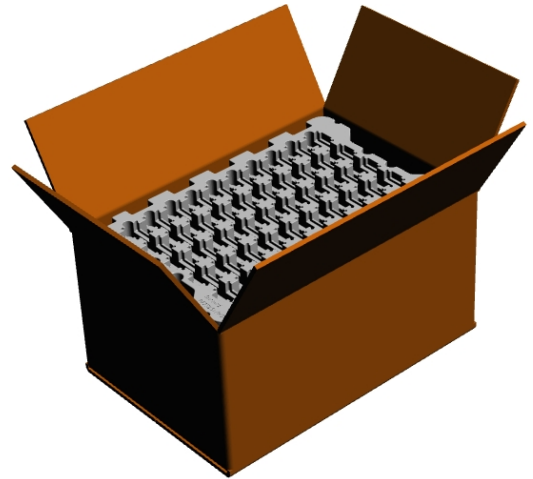


Fig.10.1.1(Outer case)

10.2 Packing Documents and Marking

10.2.1 Packing Documents

Packing documents include the following:

- 1) Packaging list;
- 2) Certificate of compliance (COC).

10.2.2 Packing QTY.

50 pcs in each pallet.
 350pcs or 7 pallets in each outer case.

10.2.3 Marking

1)Marking label information on pallet includes (see **Fig. 10.2.3-1**):

Fig.10.2.3-1: Shipping labels

- a). P/O No.
- b). Customer Part No.
- c). Sunlord Part No.
- d). Quantity.
- e). Lot No.
- f). Date code.
- g). Inspection stamp.
- h). MFG address as'Made In China'.

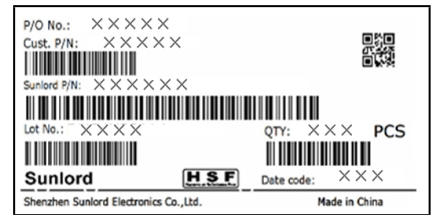


Fig.10.2.3-1

2)Marking on outer case (see**Fig.10.2.3-2~4**):

- a). Manufacturer: Sunlord ID:
 "Shenzhen Sunlord Electronics Co., Ltd."
- b). Packing label include the following:
 - i) Customer.
 - ii) Manufacturer.
 - iii) Date code.
 - iv) C/No.
 - v) P/O No.
 - vi) Customer Part No.
 - vii) Sunlord Part No.
 - viii) Quantity.
 - ix) Inspection Stamp.

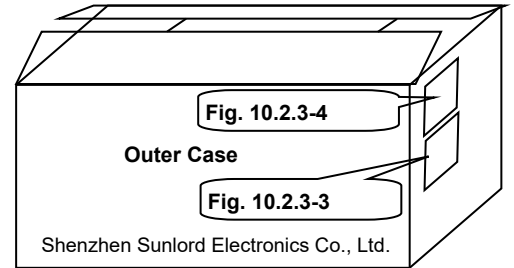


Fig. 10.2.3-2

10.2.4 The allowable number of empty chip cavities

No chip cavities missing product may exist in a pallet.

11 Visual inspection standard of product

File No:		Applied to Assembled Wire Wound SMD Power Inductorfor Automotive Electronics	REV:01
Effective date:			Acceptance
No.	Defect Item	Rejection identification	Acceptance
1	Core defect	The defect length/width (L and W) more than 3mm, NG.	AQL=0.65
2	Electrode surface glue	Glue can be seen on the electrode surface by eyes, NG.	AQL=0.65

12 Recommended Soldering Technologies

12.1 Wave-Soldering

Peak temperature and time: $255 \pm 10^\circ\text{C}/5 \pm 3\text{S}$.

12.2 Iron Soldering Profile:

Iron soldering power: Max. 30W

Pre-heating: $150^\circ\text{C}/60\text{sec}$.

Soldering Tip temperature: 350°C Max.

Soldering time: 3sec. Max.

Solder paste: Sn/3.0Ag/0.5Cu

13 Precautions

13.1 Surface mounting

- Mounting and soldering condition should be checked beforehand.
- Applicable soldering process to this product is reflow soldering only.
- Recommended conditions for repair by soldering iron:
Preheat the circuit board with product to repair at 150°C for about 1 minute.
Put soldering iron on the land-pattern.
Soldering iron's temperature: 350°C maximum/Duration: 3 seconds maximum/1 time for each terminal.
The soldering iron should not directly touch the inductor.
Product once removes from the circuit board may not be used again.

13.2 Handling

- Keep the products away from all magnets and magnetic objects.
- Be careful not to subject the products to excessive mechanical shocks.
- Please avoid applying impact to the products after mounted on pc board.
- Avoid ultrasonic cleaning.

13.3 Storage

- 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.
- Recommended conditions: $-10^\circ\text{C} \sim 40^\circ\text{C}$, 70%RH (Max.)
- 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.
- In case of storage over 6 months, solderability shall be checked before actual usage.

13.4 Regarding Regulations

- Any Class- I or Class- II ozone-depleting substance (ODS) listed in the Clean Air Act in US for regulation is not included in the products or applied to the products at any stage of whose manufacturing processes.
- Certain brominated flame retardants (PBBs, PBDEs) are not used at all.
- The products of this specification are not subject to the Export Trade Control Order in China or the Export Administration Regulations in US.

13.5 Guarantee

- The guaranteed operating conditions of the products are in accordance with the conditions specified in this specification.
- Please note that Sunlord takes no responsibility for any failure and/or abnormality which is caused by use under other than the aforesaid operating conditions.

13.6 Traceability

- Please make sure to record the lot number on the label when using Sunlord's products in order for good traceability.

14 Supplier Information

14.1 Supplier:

Shenzhen Sunlord Electronics Co., Ltd.

14.2 Manufacturer:

Shenzhen Sunlord Electronics Co., Ltd.

14.3 Manufacturing Address:

Sunlord Industrial Park, Dafuyuan Industrial Zone, Guanlan, Shenzhen, China Zip: 518110