SPECIFICATIONS

Customer	
Product Name	Wire Wound Molded SMD Power Inductors
Sunlord Part Number	MWSC0630 Series
Customer Part Number	

[☒New Released, ☐Revised] SPEC No.: MWSC03180000

【This SPEC is total 13 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, Guanlan, 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:

_____

【Version change history】

Rev.	Effective Date	Changed Contents	Change Reasons	Approved By
01	/	New release	/	Qintian Hou

Caution

All products listed in this specification are developed, designed and intended for use in general electronics equipment. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require especially high reliability, or whose failure, malfunction or trouble might directly cause damage to society, person, or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below. Please contact us for more details if you intend to use our products in the following applications.

1. Aircraft equipment
2. Aerospace equipment
3. Undersea equipment
4. nuclear control equipment
5. military equipment
6. Power plant equipment
7. Medical equipment
8. Transportation equipment (automobiles, trains, ships,etc.)
9. Traffic signal equipment
10. Disaster prevention / crime prevention equipment
11. Data-processing equipment
12. Applications of similar complexity or with reliability requirements comparable to the applications listed in the above

1. Scope

This specification applies to MWSC series of wire wound molded SMD power Inductors

2. Product Description and Identification (Part Number)

1) Description

MWSC0630H series of wire wound molded SMD power Inductor.

2) Product Identification (Part Number)

MWSC ① 0630 ② H ③ □□□ ④ □ ⑤ T ⑥ □□□ ⑦

① Type	
MWSC	Wire wound molded SMD power Inductors

② External Dimensions [mm]	
0630	6.6*7.1*3.0

③ Feature type	
H	High Type Material

④ Nominal Inductance	
Example	Example
R47	0.47uH
1R0	1.0uH
100	10uH

⑤ Inductance Tolerance	
N	±30%
M	±20%

⑥ Packing	
T	Tape Carrier Package

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

3. Shape and Dimensions

1) Dimensions and recommended PCB pattern for reflow soldering: See **Fig.3-1** and **Table 3-1**.

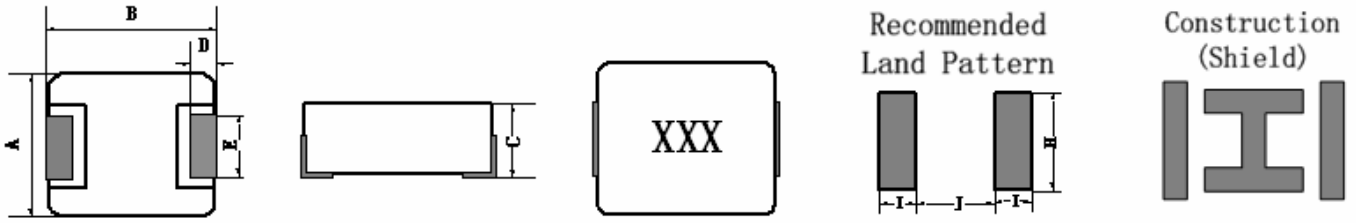


Fig:3-1 Unit:mm

Table3-1

Series	A	B	C max.	D	E	I typ.	J typ.	H typ.
MWSC0630	6.6±0.3	7.1±0.4	3.0	1.60±0.3	3.0±0.3	2.2.	3.7	3.5

4. Electrical Characteristics

Please refer to **Item 6**.

1) Operating temperature range (Including self-heating): -55℃~+125℃.
2) Storage temperature and humidity range (product with tapping): -10℃~+40℃, RH 70% Max.

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: 86 KPa to 106 KPa

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 106 KPa

5.2 Visual Examination

a. Inspection Equipment: 10 X magnifier

5.3 Electrical Test

5.3.1 Inductance (L)

a. Refer to **Item 6**.Test equipment: WK3260B LCR meter or equivalent.

b. Test Frequency and Voltage: refers to **Item 6.**

5.3.2 Direct Current Resistance (DCR)

a. Refer to **Item 6**.

b. Test equipment: HIOKI 3540 or equivalent.

5.3.3 Saturation Current (Isat)

a. Refer to Item 6.

b. Test equipment: WK3260B LCR meter or equivalent.

5.3.4 Temperature rise current (Irms)

a. Refer to **Item 6**.

b. Test equipment (**see Fig. 5.3.4-1, Fig. 5.3.4-2)**: 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 (△T) from ambient temperature

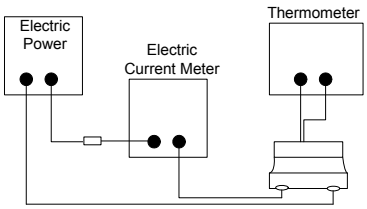


Fig. 5.3.4-1

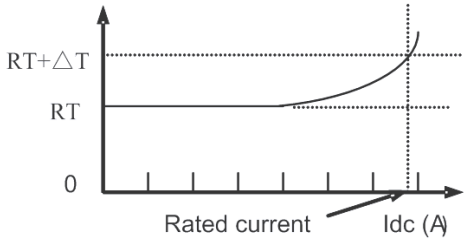


Fig. 5.3.4-2

6. Electrical Characteristics

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current		Marking
	100KHz,1V	Max.	Typ.	Max.	Typ.	Max.	Typ.	/
Units	μH	mΩ	mΩ	A	A	A	A	/
Symbol	L	DCR		Isat		Irms		/
MWSC0630HR22MT	0.22±20%	3.0	2.5	27	34	21	24	R22
MWSC0630HR33MT	0.33±20%	3.5	3.2	25	31	18	21	R33
MWSC0630HR47MT	0.47±20%	4.1	3.7	21	26	16	18	R47
MWSC0630HR68MT	0.68±20%	5.3	4.8	16	19	14	16	R68
MWSC0630HR82MT	0.82±20%	5.5	5.0	16	19	12.2	14	R82
MWSC0630H1R0MT	1.0±20%	7.8	6.8	15	18	11.3	13	1R0
MWSC0630H1R5MT	1.5±20%	11	10	12.6	15	9.6	11	1R5
MWSC0630H2R2MT	2.2±20%	17.5	15.7	11.8	14.2	8.3	9.5	2R2
MWSC0630H2R2MTY01	2.2±20%	15	13.6	10.5	13	8.3	9.5	2R2
MWSC0630H3R3MT	3.3±20%	21	19	7.7	9.3	7.4	8.5	3R3
MWSC0630H4R7MT	4.7±20%	28	25.8	6.0	7.1	5.2	6.0	4R7
MWSC0630H6R8MT	6.8±20%	53	48	6.4	7.6	4.3	5.0	6R8
MWSC0630H8R2MT	8.2±20%	68	62	5.8	7.0	3.5	4.0	8R2
MWSC0630H100MT	10±20%	68	62	5.1	6.1	3.5	4.0	100
MWSC0630H220MT	22±20%	150	140	3.4	4.0	2.0	2.3	220

Note:※1 : Rated current: Isat (max.) or Irms (max.), whichever is smaller;

※2 : Saturation Current: *Max.Value*, DC current at which the inductance drops less than 30% from its value without current;

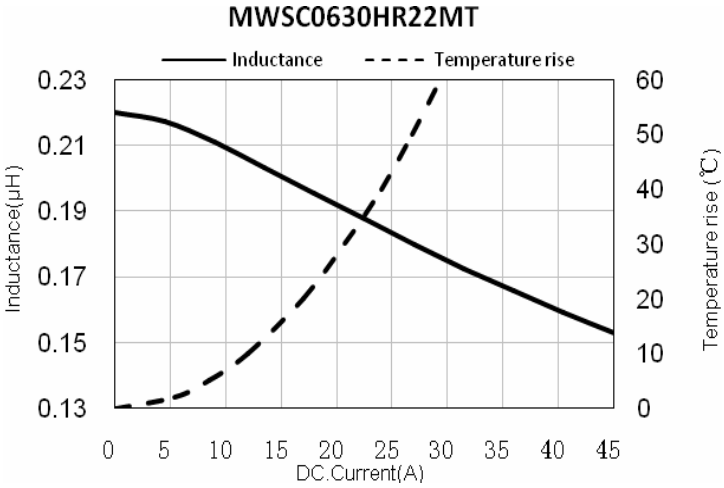
Typ. Value, DC current at which the inductance drops 30% from its value without current;

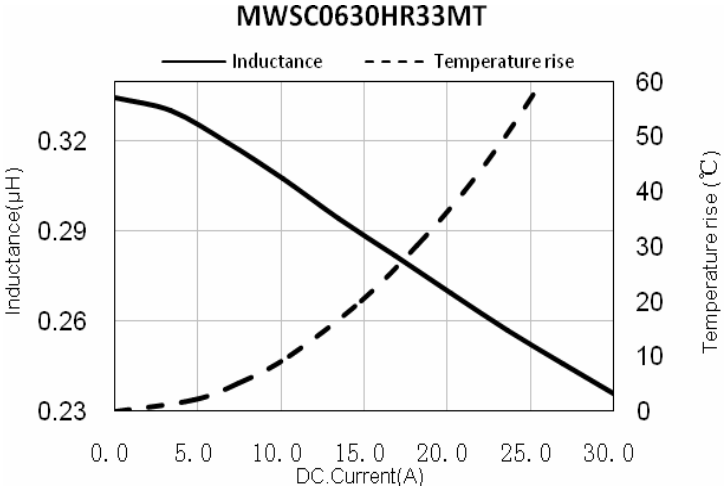
※3 : Irms: DC current that causes the temperature rise (ΔT) from 20°C ambient.

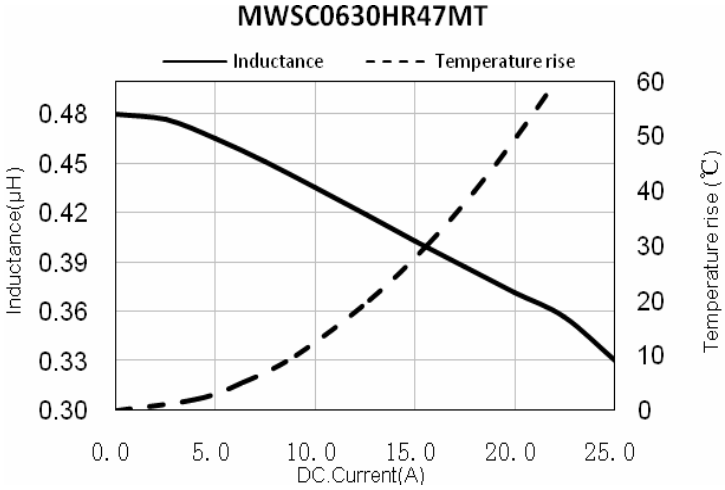
For Max. *Value*, ΔT＜40℃; for *Typ. Value*, ΔT is approximate 40℃.

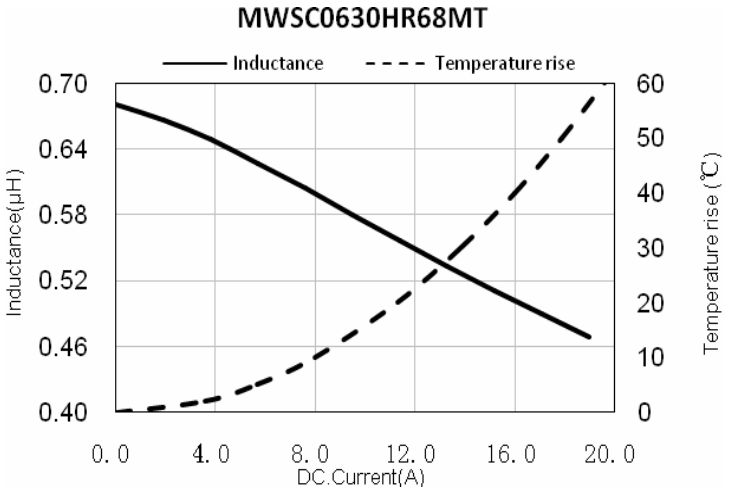
The part temperature (ambient + temp. rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

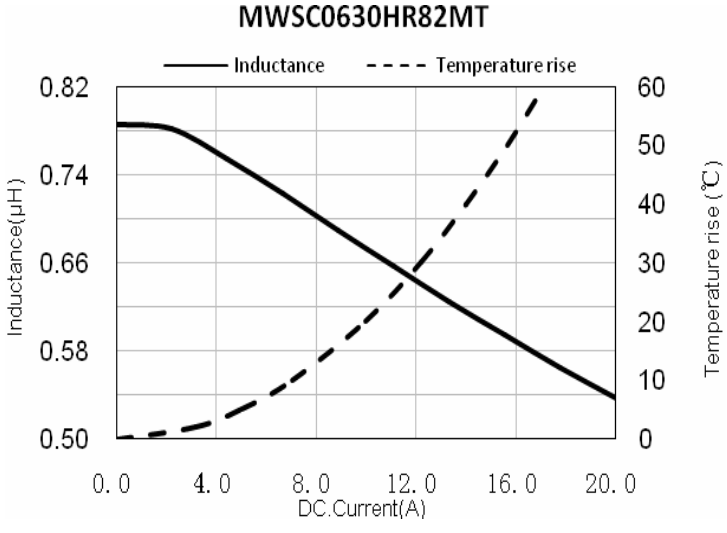
Typical Electrical Characteristics:

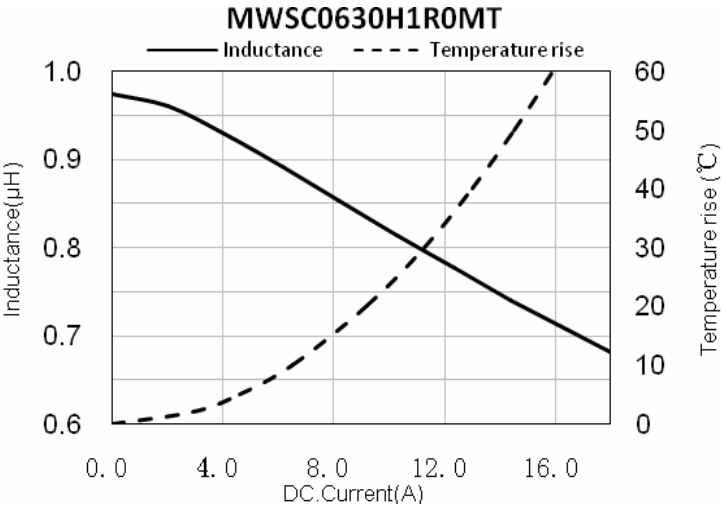




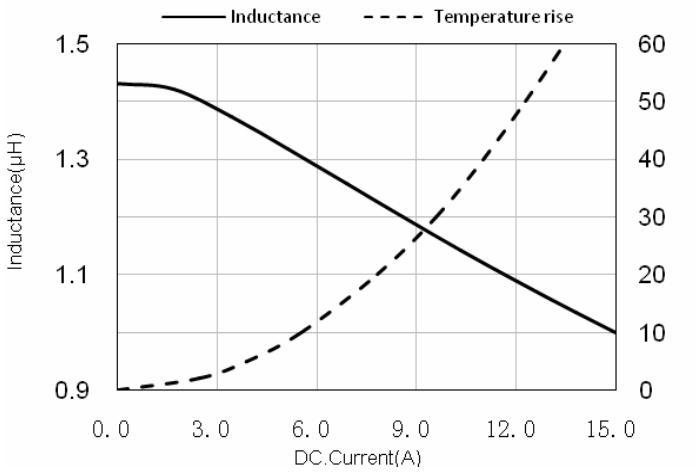




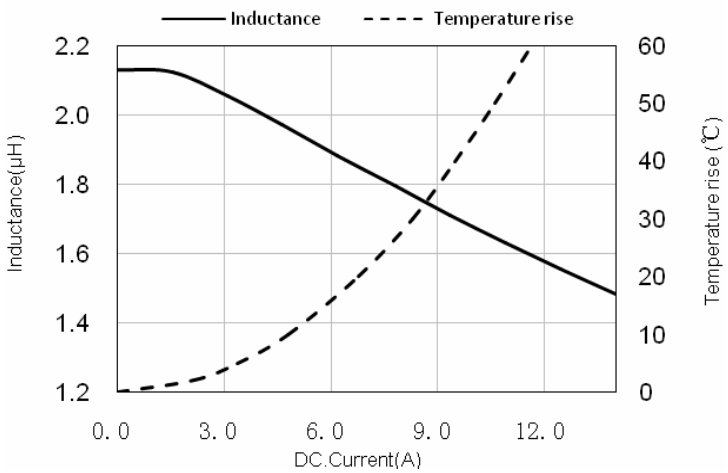




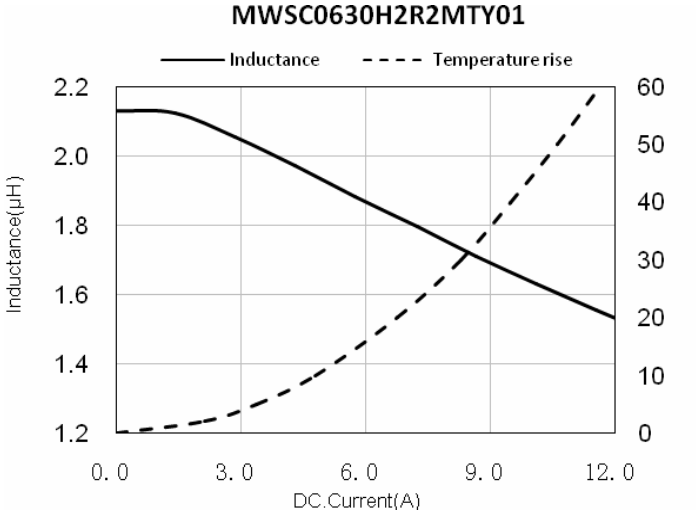
MWSC0630H1R5MT



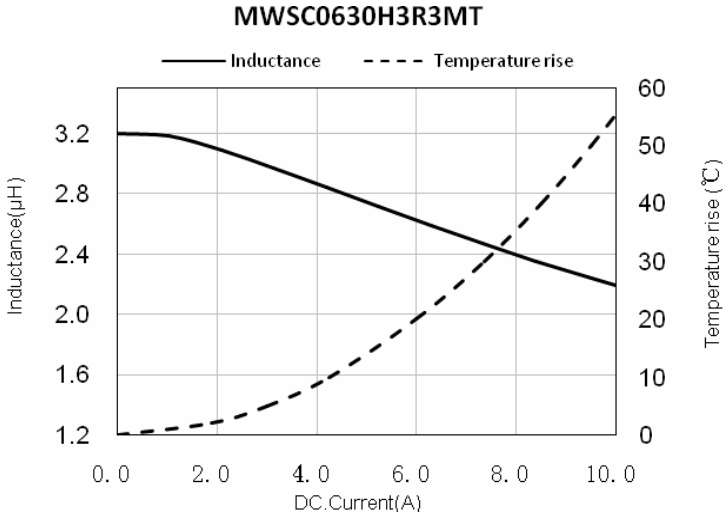
MWSC0630H2R2MT



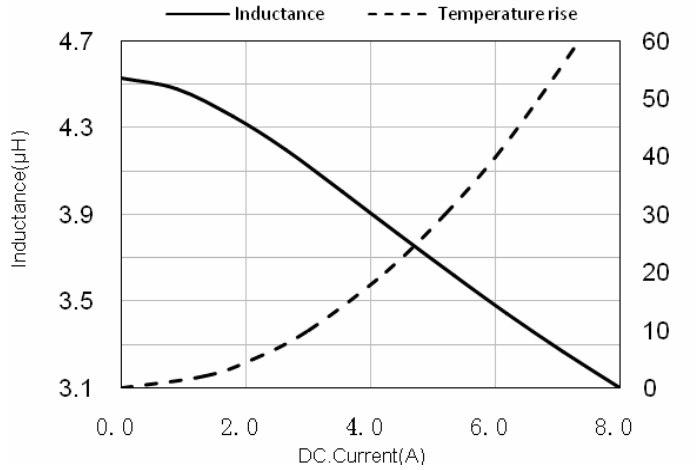
MWSC0630H2R2MTY01



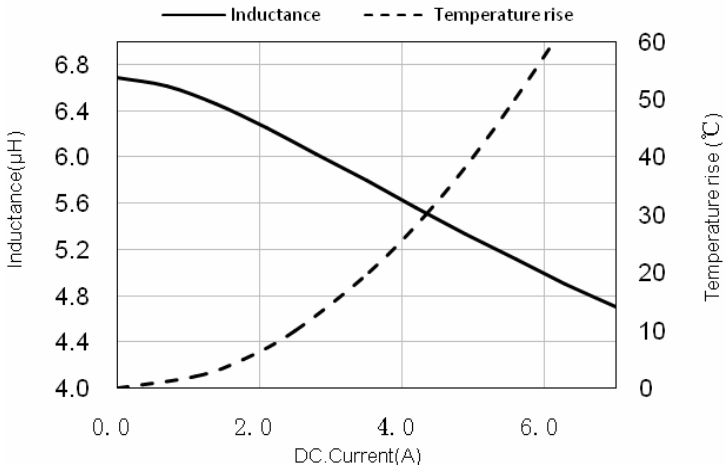
MWSC0630H3R3MT



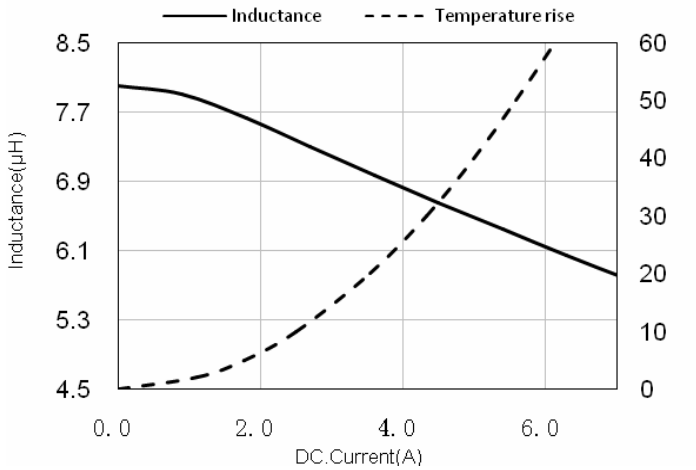
MWSC0630H4R7MT



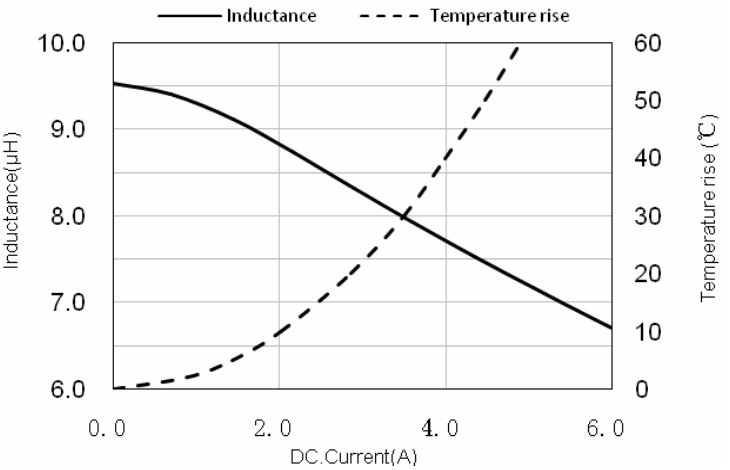
MWSC0630H6R8MT

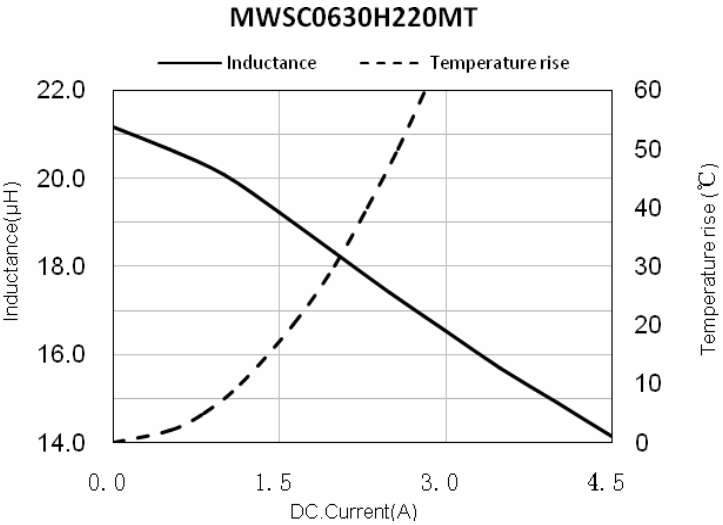


MWSC0630H8R2MT



MWSC0630H100MT



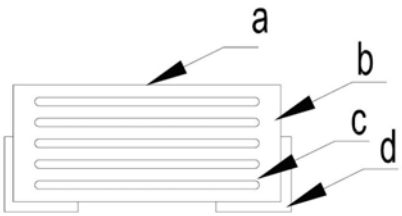


7. Structure

The structure of MWSC0630 Series product, please refer to **Fig.7-1** and **Table 7-1**.

[Table 7-1]

Symbol	Components	Material
a	MARKING	Ink(black)
b	CORE	Alloy Sponge Powder
c	WIRE	Polyurethane copper wire
d	Terminal	Copper plated with Sn

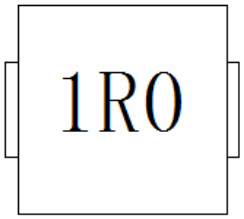


[Fig 7-1]

8. Product Marking

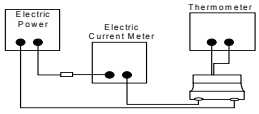
Please refer to **Fig. 8-1**.

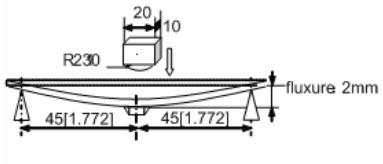
The content of marking please refers to **Item 6**.



[Fig 8-1]

9. Reliability Test

Item	Requirements	Test Methods and Remarks
9.1 Terminal Strength	No removal or split of the termination or other defects shall occur.	① Apply pull force to axis direction. ② Applied force: 5 N. ③ Keep time: 10±1s 
9.2 Vibration	① No visible mechanical damage. ② Inductance change: within ±5%.	① The test samples shall be soldered to the board. Then it shall be submitted to below test conditions. Fre. Range: 10~55Hz Total Amplitude: 1.5mm(May not exceed acceleration 196 m/s^2) Sweeping Method: 10Hz to 55Hz to 10Hz for 1 min. Time: For 2 hours on each X,Y,Z axis. ② Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.

<table>
<tr><td>9.3
Resistance to Flexure</td><td>No visible mechanical damage.
 
</td><td>① Solder the chip to the test jig (glass epoxy board) using eutectic solder. Then apply a force in the direction shown as Fig.9.2-1.
② Flexure: 2mm
③ Pressurizing Speed: 0.5mm/sec
④ Keep time: 30±1s
⑤ Test board size: 100X40X1.0
⑥ Land dimension:
Please see Fig. 3-1</td></tr>
<tr><td>9.4
Temperature Characteristic</td><td>Inductance change: within ±10%.</td><td>① Between -55℃ and +125℃
② With a reference value of +20℃</td></tr>
<tr><td>9.5
Solderability</td><td>90% or more of mounting terminal side shall be covered with fresh solder.</td><td>① Solder Temperature: 240±5℃
② Keep time: 3±0.5s
③ Immersion depth: from the main bode to 1.5mm</td></tr>
<tr><td>9.6
Resistance to Soldering Heat</td><td>① No visible mechanical damage.
② Inductance change: within ±10%.</td><td>① Solder Temperature: 255±5℃.
② Keep time:5±1s
③ Time: 2 times
④ Immersion depth: from the main bode to 1.5mm
⑤ Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.</td></tr>
<tr><td>9.7
Thermal Shock</td><td>① No visible mechanical damage.
② Inductance change: within ±10%.</td><td>① The test samples shall be placed at specified temperature for specified time by step 1 to step 2 as shown in below table in sequence.
<table>
<tr><th>Step</th><th>Temperature(℃)</th><th>Duration(min)</th></tr>
<tr><td>1</td><td>-55</td><td>30 3</td></tr>
<tr><td>2</td><td>+125</td><td>30±3</td></tr>
</table>
② Transforming interval: Max.20 sec
③ Test cycle: 10cycles.
④ Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.</td></tr>
<tr><td>9.8
Resistance to Low Temperature</td><td>① No visible mechanical damage.
② Inductance change: within ±10%.</td><td>① The test samples shall be submitted to below test conditions.
<table>
<tr><td>Temperature</td><td>-55±3℃</td></tr>
<tr><td>Time</td><td>500±24hour</td></tr>
</table>
② Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.</td></tr>
<tr><td>9.9
Loading Under Damp Heat</td><td>① No visible mechanical damage.
② Inductance change: within ±10%.</td><td>① The test samples shall be submitted to below test conditions.
<table>
<tr><td>Temperature</td><td>60±2℃</td></tr>
<tr><td>Humidity</td><td>90~95%RH</td></tr>
<tr><td>Applied current</td><td>Rated cu rent</td></tr>
<tr><td>Time</td><td>500±24hour</td></tr>
</table>
② Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.</td></tr>
<tr><td>9.10
Resistance to High Temperature</td><td>① No visible mechanical damage.
② Inductance change: within ±10%.</td><td>① The test samples shall be submitted to below test conditions.
<table>
<tr><td>Temperature</td><td>125±3℃</td></tr>
<tr><td>Time</td><td>500±24hour</td></tr>
</table>
② Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.</td></tr>
</table>

9.11 Loading at High Temperature (Life Test)	① No visible mechanical damage. ② Inductance change: within ±10%.	① The test samples shall be submitted to below test conditions. Temperature: 85±3℃ Applied current: Rated current Time: 500±24hour ② Recovery: At least 2 hours of recovery under the standard condition after the test, followed by the measurement within 24 hours.

10. Packaging, Storage and Transportation

10.1 Tape Carrier Packaging:

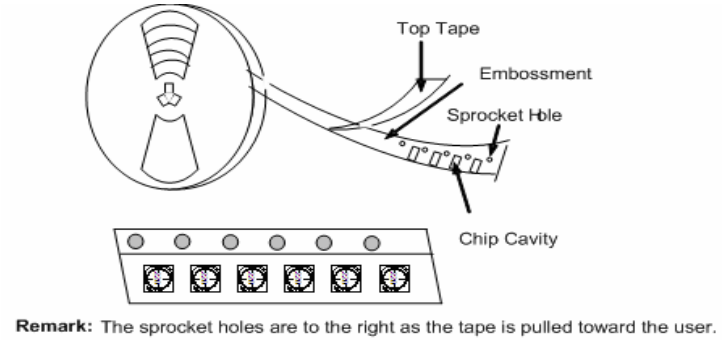
Packaging code: T

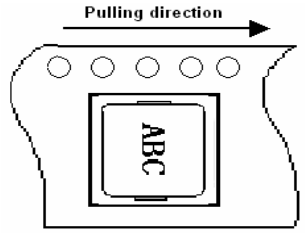
(1) Tape carrier packaging are specified in attached figure **Fig.9.1-1~2**

(2) Tape carrier packaging quantity:

Type	Standard Quantity(pcs/reel)
MWSC0630	**1500**

a. Taping Drawings (Unit: mm)





Remark: The sprocket holes are to the right as the tape is pulled toward the user.

Fig.10.1-1

b.Reel and Taping Dimensions (Unit: mm)

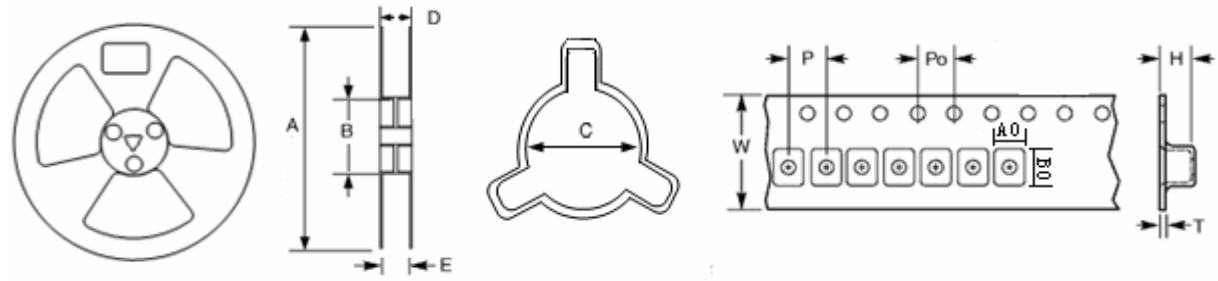


Fig.10.1-2

Type	Reel dimensions (mm)					Tape dimensions (mm)						
	A	B	C	D	E	W	P	P0	H	T	A0	B0
MWSC0630	330	100	13	22	17	16	12	4	3.4	0.4	6.9	7.6

c.Inner boxes high for 30mm or 35mm on 12-16mm Carrier tape，Inner boxes high for 35mm or 40mm on 24mm Carrier tape，A reel of a box .

d.Peeling off force: 10gf to 130gf in the direction show below.

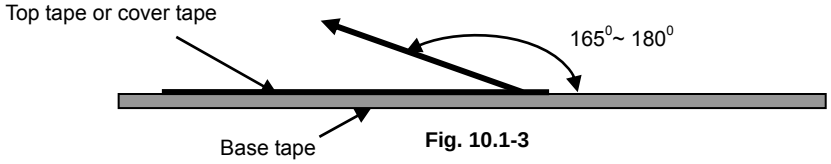


Fig. 10.1-3

10.2Packing Documents and Marking：

10.2.1Packing Documents

Packing documents include the following:

1) Packaging list
2) Certificate of compliance (COC)

10.2.2Packing QTY.

1) Inner Box: 10 reel in each box.
2) Outer Box:4 or 8 inner boxes in each outer case.
3) 40 or 80 reels in each outer case.

10.2.3Marking

1)Marking label information on reels includes (see **Fig.10.2.3-1**、**Fig.10.2.3-2A/2B**):

a) Sunlord P/N.
b) Quantity per reel
c) Lot number
d) Inspection No.
e) Inspection stamp
f) MFG address as 'Made In China'

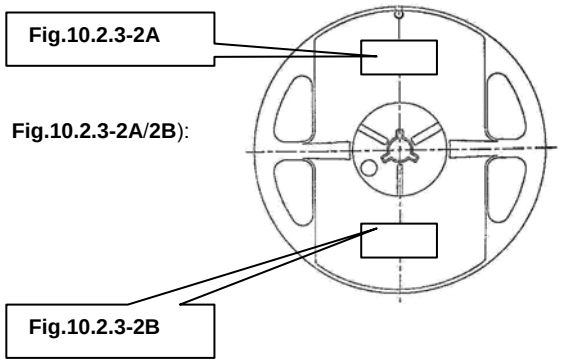


Fig.10.2.3-1

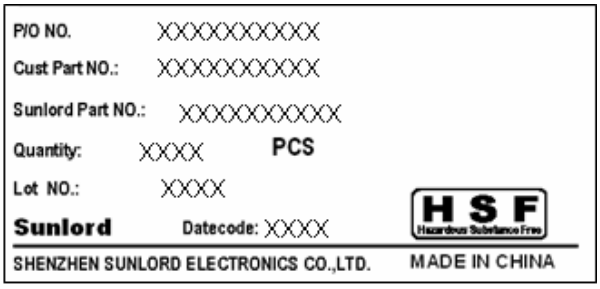


Fig.10.2.3-2A

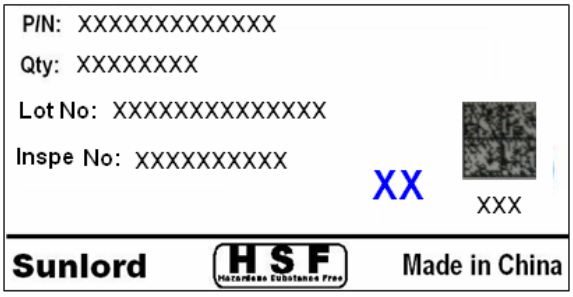


Fig.10.2.3-2B

2)Marking label information on inner box

a). Inner box please refers to **Fig.10.2.3-3**and **Table 10.2.3-1**
b). Marking Label on inner box(see **Fig.**10**.2.3-4**)

3)Marking on outer case (see **Fig.**10**.2.3-5~7**):

Out case size pleases reefers to **Table 10.2.3-2**.

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.
Example; "1/10" means that this case is the 1st one
Of total 10 cases
v) P/O No.
vi) Customer Part No.
vii) Sunlord Part No.
viii) Quantity.
i) Inspection Stamp.

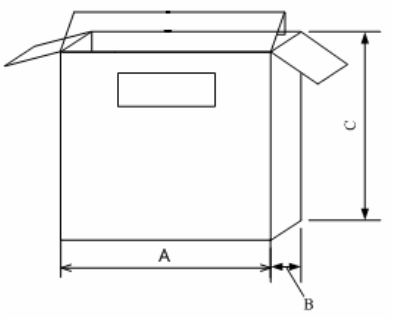


Fig.10.2.3-3

Packaging type	A(mm)	B(mm)	C(mm)
Inner box	340	30	340

[Table 10.2.3-1]

Packaging type	L(mm)	W(mm)	H(mm)
Type1	380	380	250
Type2	380	380	190

[Table 10.2.3-2]

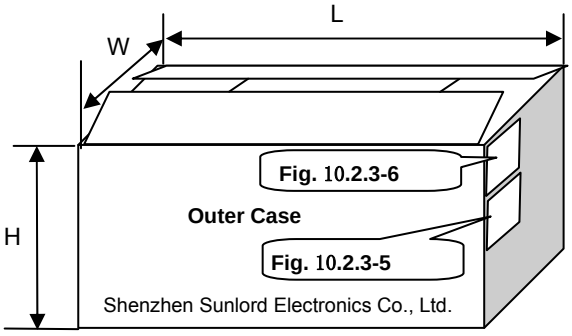


Fig. 10.2.3-4

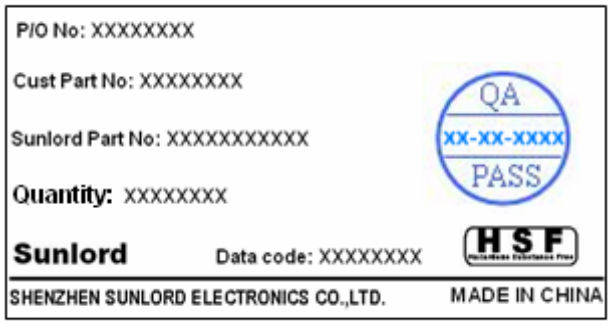


Fig.10.2.3-5

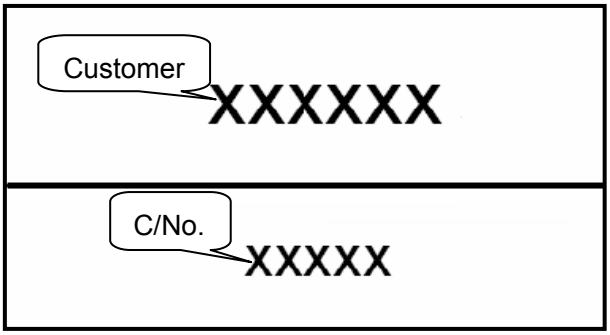
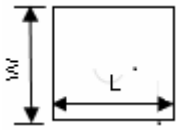
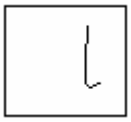
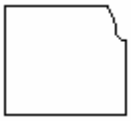
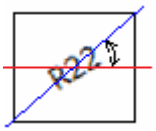


Fig.10.2.3-6

11. Visual inspection standard of product

File No:		Applied to Wire Wound Molded SMD Power Inductors Series		REV:02
Effective date:				
No.	**Defect Item**	**Graphic**	**Rejection identification**	**Acceptance**
1	Core defect		The defect length/width (l or w) more than L/6 or W/6, NG.	AQL=0.65
2	Core crack		Visual cracks, NG.	AQL=0.65
3	Lack of edge horn		The lack of edges on the vision, NG.	AQL=0.65
4	Electrode uneven		The clearance Δf ≥0.15mm, NG;	AQL=0.65
5	Marking defect		① The content of marking 1) is indistinct, 2) disagrees with current product P/N requirements, NG; ② Intersection angle by L1 and L2 more than 45°, NG.	AQL=0.65

12. Recommended Soldering Technologies

12.1Re-flowing Profile:

△ Preheat condition: 150 ~200℃/60~120sec.
△ Allowed time above 217℃: 60~90sec.
△ Max temp: 260℃
△ Max time at max temp: 5sec.
△ Solder paste: Sn/3.0Ag/0.5Cu
△ Allowed Reflow time: 2x max
Please refer to **Fig. 12.1-1**.

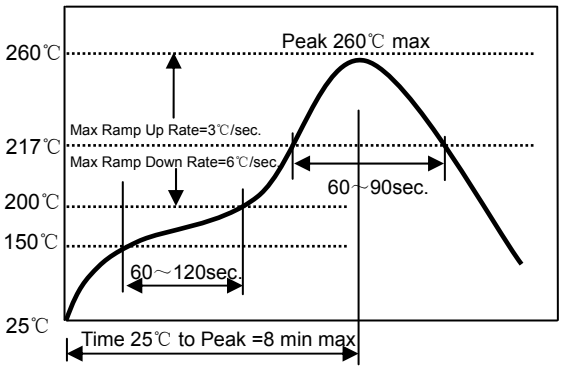


Fig. 12.1-1

[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.]

12.2 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

Please refer to **Fig. 12.2-1**.

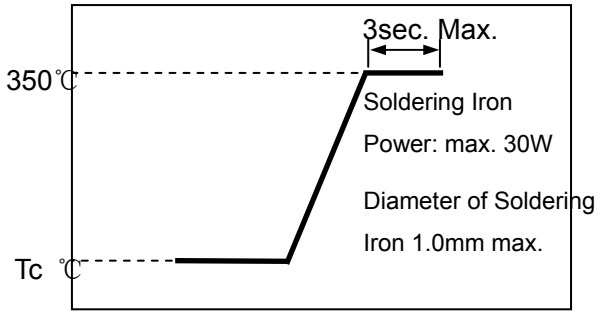


Fig. 12.2-1.

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

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℃ for about 1 minute.
  Put soldering iron on the land-pattern.
  Soldering iron's temperature: 350℃ 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 Handing

- 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℃~40℃, 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-Ⅰor 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.

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