

SPECIFICATIONS

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

New Released, Revised]

SPEC No.: MWSA05170000

【 This SPEC is total 14 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	/	Hai Guo

1. Scope

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

2. Product Description and Identification (Part Number)

- 1) Description
Wire Wound Molded SMD Type Power Inductor, MWSAXXXX, XX μH± X% @XXX KHz/XXXV, XXXmΩ, XXXm A.
- 2) Product Identification (Part Number)

MWSA XXXX X -XXX □ I
 ① ② ③ ④ ⑤ ⑥

① Type	
MWSA	Wire wound molded SMD power Inductors

③ Configuration	
X	X Type

② External Dimensions (mm)	
0412~1206	

④ Nominal Inductance	
Example	Nominal Value
1R0	1.0μH
100	10μH
101	100μH

⑤ Inductance Tolerance	
M	±20%

⑥ Packing	
T	Tape Carrier Package

3. Electrical Characteristics

Please refer to Appendix A.

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

4. Shape and Dimensions

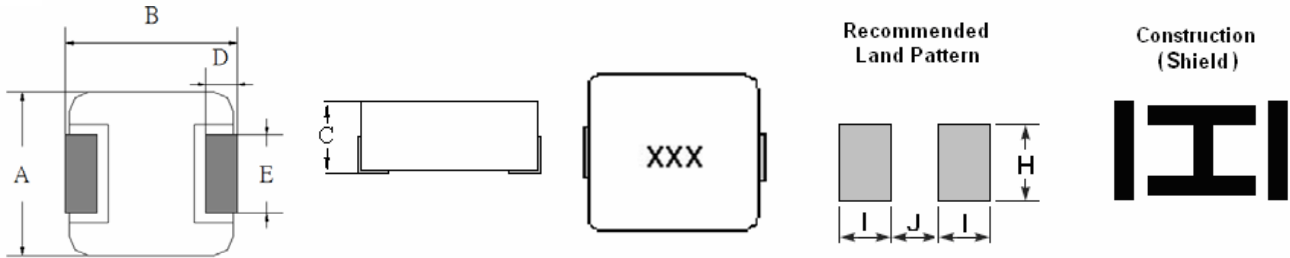


Fig. 4-1

Unit: mm

Series	A	B	C max.	D	E	I typ.	J typ.	H typ.
MWSA0410	4.2±0.3	4.4±0.35	1.0	0.8±0.3	2.0±0.3	1.5.	2.2	2.5
MWSA0412	4.2±0.3	4.4±0.35	1.2	0.8±0.3	2.0±0.3	1.5.	2.2	2.5
MWSA0415	4.2±0.3	4.4±0.35	1.5	0.8±0.3	2.0±0.3	1.5.	2.2	2.5
MWSA0402	4.2±0.3	4.4±0.35	2.0	0.8±0.3	2.0±0.3	1.5.	2.2	2.5
MWSA0515	5.2±0.3	5.4±0.3	1.5	1.20±0.3	2.2±0.3	1.9	2.2	2.5
MWSA0518	5.2±0.3	5.4±0.3	1.8	1.20±0.3	2.2±0.3	1.9	2.2	2.5
MWSA0503	5.2±0.3	5.4±0.3	3.0	1.20±0.3	2.2±0.3	1.9.	2.2	2.5
MWSA0618	6.6±0.3	7.1±0.4	1.8	1.60±0.3	3.0±0.3	2.2.	3.7	3.5
MWSA0624	6.6±0.3	7.1±0.4	2.4	1.60±0.3	3.0±0.3	2.2	3.7	3.5
MWSA0603	6.6±0.3	7.1±0.4	3.0	1.60±0.3	3.0±0.3	2.2.	3.7	3.5
MWSA1004C	10.5±0.5	11.5±1.0	4.0	2.5±0.3	3.0±0.3	3.5	6.0	4.0
MWSA1004	10.5±0.5	11.5±1.0	4.0	2.5±0.3	3.0±0.3	3.5	6.0	4.0
MWSA1204	12.8±0.5	13.5±1.0	4.0	2.0±0.3	5.0±0.3	4.5	6.0	5.0
MWSA1205	12.8±0.5	13.5±1.0	5.0	2.0±0.3	See Remarks	4.5	6.0	5.0
MWSA1206	12.8±0.5	13.5±1.0	6.5	2.0±0.3	3.85±0.3	4.5	6.0	5.0

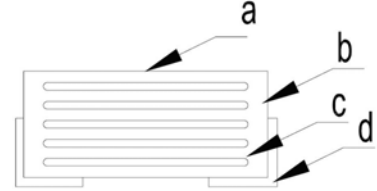
Remarks:

Code	Dimensions	
	R36/R50/R68	3R3/100/150
1R0/1R5/2R2	220/330/470	
E	3.85±0.5	5.0±0.5

Structure and Components: See Table 4-2

Table 4-2]

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



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 DC Resistance (DCR)

- a. Refer to **Appendix A**.
- b. Test equipment (Analyzer): HIOKI3540 or equivalent.


5.3.2 Inductance (L)

- a. Refer to **Appendix A**.
- b. Test equipment: Wayne kerr3260+3265B or equivalent.

5.3.3 Rated Current

- a. Refer to **Appendix A**.
- b. Test equipment: Wayne kerr3260+3265B, Agilent E3633A, R2M-2H3 or equivalent.
- c. Definition of Rated Current (I_r): With the condition of the DC current pass, the inductance decrease by 30% of the standard value, compare to the temperature rise by 40℃, the smaller is Rated Current.(reference environment temperature:20℃)

5.4 Reliability Test

Item	Requirements	Test Methods and Remarks								
5.4.1 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 								
5.4.2 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. <table border="1" style="margin-left: 20px;"> <tr> <td>Fre. Range</td> <td>10~55Hz</td> </tr> <tr> <td>Total Amplitude</td> <td>1.5mm(May not exceed acceleration 196 m/s²)</td> </tr> <tr> <td>Sweeping Method</td> <td>10Hz to 55Hz to 10Hz for 1 min.</td> </tr> <tr> <td>Time</td> <td>For 2 hours on each X,Y,Z axis.</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.	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.
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.									

5.4.3 Temperature Characteristic	Inductance change: within $\pm 10\%$.	① Between -55°C and $+125^{\circ}\text{C}$ ② With a reference value of $+20^{\circ}\text{C}$									
5.4.4 Solderability	90% or more of mounting terminal side shall be covered with fresh solder.	① Solder Temperature: $240\pm 5^{\circ}\text{C}$ ② Keep time: $3\pm 0.5\text{s}$ ③ Immersion depth: from the main bode to 1.5mm									
5.4.5 Resistance to Soldering Heat	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	① Solder Temperature: $255\pm 5^{\circ}\text{C}$. ② Keep time: $5\pm 1\text{s}$ 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.									
5.4.6 Thermal Shock	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	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 border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature($^{\circ}\text{C}$)</th> <th>Duration(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55</td> <td>30 3</td> </tr> <tr> <td>2</td> <td>+125</td> <td>30\pm3</td> </tr> </tbody> </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.	Step	Temperature($^{\circ}\text{C}$)	Duration(min)	1	-55	30 3	2	+125	30 \pm 3
Step	Temperature($^{\circ}\text{C}$)	Duration(min)									
1	-55	30 3									
2	+125	30 \pm 3									
5.4.7 Resistance to Low Temperature	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	① The test samples shall be submitted to below test conditions. <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature</td> <td>$-55\pm 3^{\circ}\text{C}$</td> </tr> <tr> <td>Time</td> <td>500\pm24hour</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.	Temperature	$-55\pm 3^{\circ}\text{C}$	Time	500 \pm 24hour					
Temperature	$-55\pm 3^{\circ}\text{C}$										
Time	500 \pm 24hour										
5.4.8 Loading Under Damp Heat	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	① The test samples shall be submitted to below test conditions. <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature</td> <td>$60\pm 2^{\circ}\text{C}$</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\pm24hour</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.	Temperature	$60\pm 2^{\circ}\text{C}$	Humidity	90~95%RH	Applied current	Rated cu rent	Time	500 \pm 24hour	
Temperature	$60\pm 2^{\circ}\text{C}$										
Humidity	90~95%RH										
Applied current	Rated cu rent										
Time	500 \pm 24hour										
5.4.9 Resistance to High Temperature	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	① The test samples shall be submitted to below test conditions. <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature</td> <td>$125\pm 3^{\circ}\text{C}$</td> </tr> <tr> <td>Time</td> <td>500\pm24hour</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.	Temperature	$125\pm 3^{\circ}\text{C}$	Time	500 \pm 24hour					
Temperature	$125\pm 3^{\circ}\text{C}$										
Time	500 \pm 24hour										
5.4.10 Loading at High Temperature (Life Test)	① No visible mechanical damage. ② Inductance change: within $\pm 10\%$.	① The test samples shall be submitted to below test conditions. <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature</td> <td>$85\pm 3^{\circ}\text{C}$</td> </tr> <tr> <td>Applied current</td> <td>Rated current</td> </tr> <tr> <td>Time</td> <td>500\pm24hour</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.	Temperature	$85\pm 3^{\circ}\text{C}$	Applied current	Rated current	Time	500 \pm 24hour			
Temperature	$85\pm 3^{\circ}\text{C}$										
Applied current	Rated current										
Time	500 \pm 24hour										

6. Packaging, Storage and Transportation

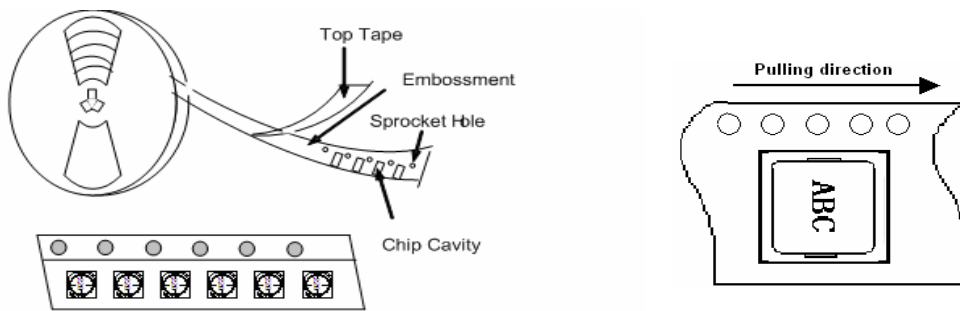
6.1 Tape Carrier Packaging:

Packaging code: T

- (1) Tape carrier packaging are specified in attached figure Fig.6.1-1~2
- (2) Tape carrier packaging quantity:

Type	Standard Quantity (pcs/reel)	Type	Standard Quantity (pcs/reel)
MWSA0410	3000	MWSA0618	1500
MWSA0412	3000	MWSA0624	1500
MWSA0415	3000	MWSA0603	1500
MWSA0402	3000	MWSA1004C	500
-	-	MWSA1004	500
MWSA0515	2000	MWSA1204	500
MWSA0518	2000	MWSA1205	500
MWSA0503	2000	MWSA1206	500

a. Taping Drawings (Unit: mm)



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

Fig.6.1-1

c. Reel and Taping Dimensions (Unit: mm)

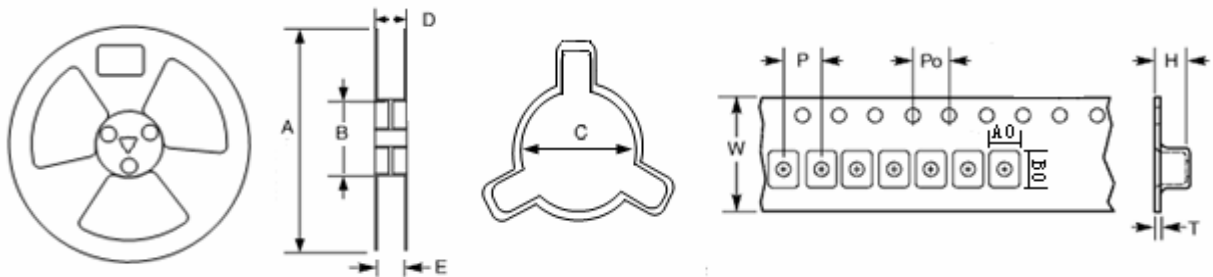
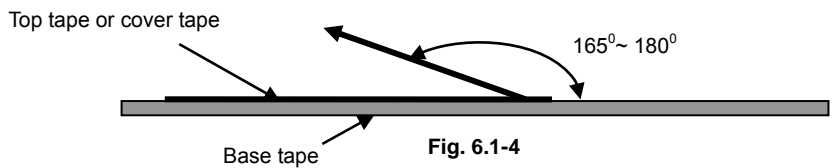


Fig.6.1-2

Type	Reel dimensions (mm)					Tape dimensions (mm)						
	A	B	C	D	E	W	P	P0	H	T	A0	B0
MWSA0410	330	100	13	20.5	16.5	16	12	4	1.4	0.35	4.6	4.9
MWSA0412	330	100	13	22	17	12	8	4	1.4	0.35	4.5	4.8
MWSA0415	330	100	13	16.5	12.5	12	8	4	1.8	0.35	4.5	4.8
MWSA0402	330	100	13	22	17	12	8	4	2.5	0.35	4.5	4.8
MWSA0515	330	100	13	16.5	12.5	12	8	4	2.0	0.35	5.7	5.9
MWSA0518	330	100	13	22	17	12	8	4	2.3	0.35	5.7	5.9
MWSA0503	330	100	13	22	17	12	8	4	3.6	0.35	5.7	5.9
MWSA0618	330	100	13	22	17	16	12	4	2.3	0.35	7.0	7.5
MWSA0624	330	100	13	22	17	16	12	4	2.8	0.35	7.0	7.5
MWSA0603	330	100	13	22	17	16	12	4	3.4	0.4	7.0	7.5
MWSA1004C	330	100	13	30	25	24	16	4	4.1	0.4	11	12.6
MWSA1004	330	100	13	30	25	24	16	4	4.1	0.4	11	12.6
MWSA1204	330	100	13	30	25	24	16	4	4.3	0.4	13.1	14.9
MWSA1205	330	100	13	30	25	24	16	4	5.3	0.4	13.1	14.9
MWSA1206	330	100	13	30	25	24	16	4	6.7	0.4	13.1	14.9

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



6.2 Storage

- (1) The solderability of the external electrodes may deteriorate if packages are stored in high humidity. Besides, to ensure packing material's good state, packages must be stored at -10°C to 40°C and 70% RH Max.
- (2) The solderability of the external electrodes may deteriorate if packages are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H₂S).
- (3) Packaging materials may deform if packages are exposed directly to sunlight.
- (4) Minimum packages, such as polyvinyl heat-seal packages shall not be opened until they are used. If opened, use the reels as soon as possible.
- (5) Solderability shall be guaranteed for a period of time from the date of delivery on condition that they are stored at the specified environment. For those parts, which passed more than the time shall be checked solderability before using.
- (6) For magnetic products, keep clear of anything that may generate magnetic fields to avoid change of products performance.
- (7) To avoid any damage to products, do not load mechanic force on products or place heavy goods on products, and exclude strong vibration or drop.
- (8) In case of storage over 12 months, solderability shall be checked before actual usage.

7. Warning and Attention

7.1 Precautions on Use

- (1) Always wear static control bands to protect against ESD.
- (2) Any devices used with the products (soldering irons, measuring instruments) should be properly grounded.
- (3) Keep bare hands and metal conductors (i.e., metal desk) away from electrodes or conductive areas that lead to electrodes.
- (4) Preheat when soldering.
- (5) Don't apply current in excess of the rated current value. It may reduce the impedance or inductance, or cause damage to components due to over-current.
- (6) For magnetic products, keep clear of anything that may generate magnetic fields such as speakers and coils. Use non-magnetic tweezers when handing the chips.
- (7) When soldering, the electrical characteristics may be varied due to hot energy and mechanical stress.
- (8) When coating products with resin, the relatively high resin curing stress may change the electrical characteristics. For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected. Before using, please evaluate reliability with the product mounted in your application set.
- (9) When mount chips with adhesive in preliminary assembly, do appropriate check before the soldering stage, i.e., the size of land

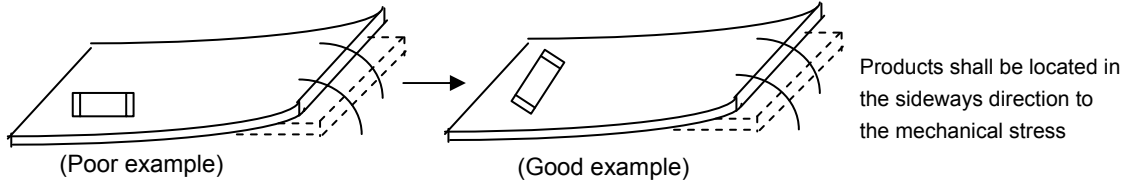
pattern, type of adhesive, amount applied, hardening of the adhesive on proper usage and amounts of adhesive to use.

- (10) Mounting density: Add special attention to radiating heat of products when mounting other components nearby. The excessive heat by other products may cause deterioration at joint of this product with substrate.
- (11) Since some products are constructed like an open magnetic circuit, narrow spacing between components may cause magnetic coupling.
- (12) Please do not give the product any excessive mechanical shocks in transportation.
- (13) Please do not touch wires by sharp terminals such as tweezers to avoid causing any damage to wires.
- (14) Please do not add any shock and power to the soldered product to avoid causing any damage to chip body.
- (15) Please do not touch the electrodes by naked hand as the solderability of the external electrodes may deteriorate by grease or oil on the skin.

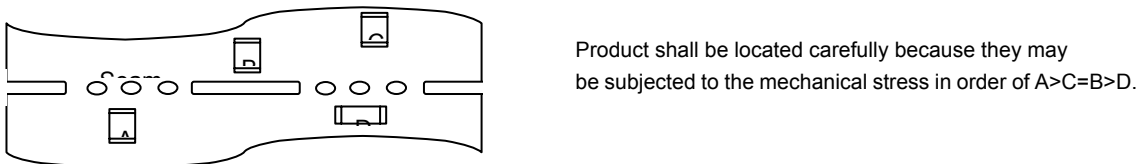
7.2 PCB Bending Design

The following shall be considered when designing and laying out PCB's.

- (1) PCB shall be designed so that products are not subjected to the mechanical stress from board warp or deflection.



- (2) Products location on PCB separation.



- (3) When splitting the PCB board, or insert (remove) connector, or fasten thread after mounting components, care is required so as not to give any stress of deflection or twisting to the board. Because mechanical force may cause deterioration of the bonding strength of electrode and solder, even crack of product body. Board separation should not be done manually, but by using appropriate devices.

7.3 Recommended PCB Design for SMT Land-Patterns

When chips are mounted on a PCB, the amount of solder used (size of fillet) can directly affect chip performance. Therefore, the following items must be carefully considered in the design of solder land patterns:

- (1) The amount of solder applied can affect the ability of chips to withstand mechanical stresses which may lead to breaking or cracking. Therefore, when designing land-patterns it is necessary to consider the appropriate size and configuration of the solder pads which in turn determines the amount of solder necessary to form the fillets.
- (2) When more than one part is jointly soldered onto the same land or pad, the pad must be designed that each component's soldering point is separated by solder-resist. Recommended land dimensions please refer to product specification.

8 Recommended Soldering Technologies

8.1 Re-flowing Profile:

- △ Preheat condition: 150 ~200°C/60~120sec.
- △ Allowed time above 217°C: 60~90sec.
- △ Max temp: 255°C
- △ Max time at max temp: 10sec.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Allowed Reflow time: 2x max

Please refer to Fig. 8.1

[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.]

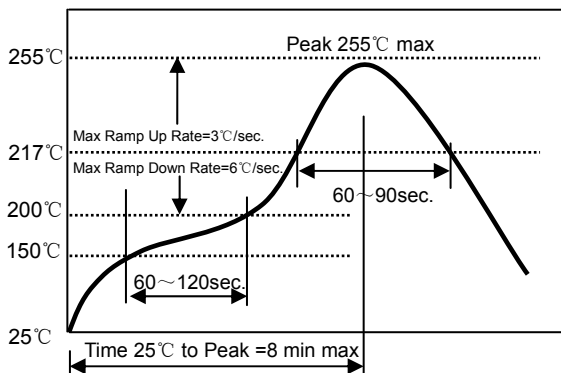


Fig. 8.1

8.2 Iron Soldering Profile

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

Please refer to Fig. 8.2.

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

8.3 Recommended Soldering Technologies

Heat Gun Profile

- △ Soldering tip temperature: 350°C Max.
- △ Hot air time: <5sec (over 5sec may cause wiring inductor short)
- △ When repairing or reworking the component near inductors, take over-heat protection for Inductors

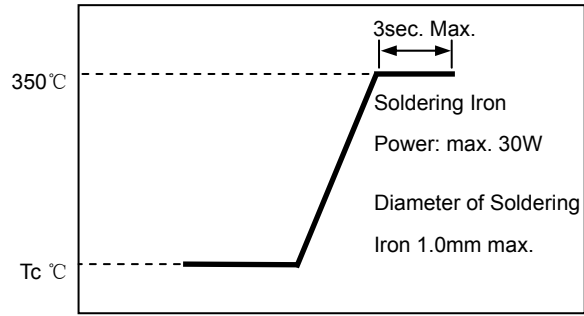
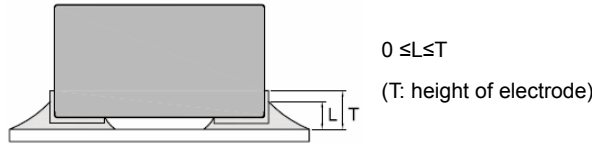


Fig. 8.2.

9. Solder Volume

Solder shall be used not to exceed as shown below. Exceeding solder volume may cause the failure of mechanical or electrical performance.



10. Cleaning

Products shall be cleaned on the following conditions:

- (1) Cleaning temperature shall be limited to 60°C Max. (40°C Max. for fluoride and alcohol type cleaner.)
- (2) Ultrasonic cleaning shall comply with the following conditions, avoiding the resonance phenomenon at the mounted products and PCB.
 - Power: 20W/l Max.
 - Frequency: 28 KHz to 40 KHz
 - Time: 5 minutes Max
 - Notice: Wire wound products do not recommend for ultrasonic cleaning.
- (3) Cleaner
 - a Alternative cleaner
 - Isopropyl alcohol (IPA)
 - HCFC-225
 - b Aqueous agent
 - Surface Active Agent Type (Clean through-750H)
 - Hydrocarbon Type (Techno Cleaner-335)
 - Higher Alcohol Type (Pine Alpha ST-100S)
 - Alkali saponifier Type (※ Aqua Cleaner 240)
 - ※ Alkali saponification shall be diluted to 20% volume with de-ionized water.
 - ※ Please contact us before using other cleaner.
- (4) There shall be no residual flux and residual cleaner after cleaning. In the case of using aqueous agent, product shall be dried completely after rinse with de-ionized water in order to remove the cleaner.
- (5) Some products may become slightly whitened. However, product performance or usage is not affected.

11. 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

MWSA0410 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0410-100MT	10.0	100k, 1.0V	335	1.6	1.5

MWSA0412 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0412-R15MT	0.15	100k, 1.0V	9.0	15.0	7.5
MWSA0412-R22MT	0.22	100k, 1.0V	11.0	11.0	7.0
MWSA0412-R33MT	0.33	100k, 1.0V	19	8.4	6.5
MWSA0412-R47MT	0.47	100k, 1.0V	21	6.8	6.0
MWSA0412-R68MT	0.68	100k, 1.0V	36	6.0	4.7
MWSA0412-1R0MT	1.0	100k, 1.0V	47	5.5	4.5
MWSA0412-1R5MT	1.5	100k, 1.0V	75	4.0	3.25
MWSA0412-2R2MT	2.2	100k, 1.0V	83.5	3.5	2.75
MWSA0412-4R7MT	4.7	100k, 1.0V	195	2.8	1.8

MWSA0415 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0415-R36MT	0.36	100k, 1.0V	10	9.5	8.0
MWSA0415-R68MT	0.68	100k, 1.0V	29	6.0	4.3
MWSA0415-1R5MT	1.50	100k, 1.0V	57.6	5.2	4.2

MWSA0402 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0402-R10MT	0.10	100k, 1.0V	4.0	22.0	13.0
MWSA0402-R22MT	0.22	100k, 1.0V	6.6	12.5	9.5
MWSA0402-R33MT	0.33	100k, 1.0V	11.0	12.0	10.0
MWSA0402-R47MT	0.47	100k, 1.0V	14	9.5	7.5
MWSA0402-R56MT	0.56	100k, 1.0V	16	10	7.0
MWSA0402-R68MT	0.68	100k, 1.0V	18	9.0	7.0
MWSA0402-1R0MT	1.0	100k, 1.0V	27	7.0	6.0
MWSA0402-1R2MT	1.2	100k, 1.0V	27	7.0	6.0
MWSA0402-1R5MT	1.5	100k, 1.0V	46	6.0	5.0
MWSA0402-2R2MT	2.2	100k, 1.0V	58	5.0	4.5
MWSA0402-2R7MT	2.7	100k, 1.0V	70	4.0	4.5
MWSA0402-3R3MT	3.3	100k, 1.0V	87	4.0	3.3
MWSA0402-4R7MT	4.7	100k, 1.0V	105	3.0	2.8
MWSA0402-6R8MT	6.8	100k, 1.0V	175	2.5	2.4
MWSA0402-100MT	10.0	100k, 1.0V	282	2.2	1.6
MWSA0402-220MT	22.0	100k, 1.0V	363	1.4	1.2

MWSA0515 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms

MWSA0515-R47MT	0.47	100k, 1.0V	13	9.0	5.5
MWSA0515-R68MT	0.68	100k, 1.0V	18	6.0	4.0

MWSA0518 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0518-R47MT	0.47	100k, 1.0V	9	12.5	10.5
MWSA0518-R56MT	0.56	100k, 1.0V	10	11	9.5
MWSA0518-1R0MT	1.0	100k, 1.0V	17	9.0	8.0
MWSA0518-1R5MT	1.5	100k, 1.0V	26	8	7.5
MWSA0518-2R2MT	2.2	100k, 1.0V	35	6.5	5.0
MWSA0518-3R3MT	3.3	100k, 1.0V	58	5.0	4.5
MWSA0518-4R7MT	4.7	100k, 1.0V	85	4.0	3.5
MWSA0518-6R8MT	6.8	100k, 1.0V	120	3.4	2.8
MWSA0518-100MT	10.0	100k, 1.0V	155	3.0	2.5

MWSA0503 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0503-R10MT	0.1	100k, 1.0V	3.0	33	25
MWSA0503-R20MT	0.2	100k, 1.0V	3.9	20	14
MWSA0503-R33MT	0.33	100k, 1.0V	5.5	18	14
MWSA0503-R33MTB01	0.33	100k, 1.0V	5.3	24	13.7
MWSA0503-R47MT	0.47	100k, 1.0V	8.5	15	11
MWSA0503-R68MT	0.68	100k, 1.0V	12.0	11.5	9.0
MWSA0503-1R0MT	1.0	100k, 1.0V	14	11	8.5
MWSA0503-1R2MT	1.2	100k, 1.0V	16	11	8.5
MWSA0503-1R5MT	1.5	100k, 1.0V	25	9	8.2
MWSA0503-2R2MT	2.2	100k, 1.0V	29	7.5	7.0
MWSA0503-3R3MT	3.3	100k, 1.0V	38	6.0	5.5
MWSA0503-4R7MT	4.7	100k, 1.0V	60	5.0	4.5
MWSA0503-6R8MT	6.8	100k, 1.0V	90	4.0	3.5
MWSA0503-8R2MT	8.2	100k, 1.0V	110	3.7	3.3
MWSA0503-100MT	10.0	100k, 1.0V	125	3.5	3.2

MWSA0618 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0618-R10MT	0.10	100k, 1.0V	2.3	38	25
MWSA0618-R22MT	0.22	100k, 1.0V	3.5	24	22
MWSA0618-R47MT	0.47	100k, 1.0V	8.4	18.0	11.5
MWSA0618-R68MT	0.68	100k, 1.0V	12	17	9.5
MWSA0618-1R0MT	1.0	100k, 1.0V	16	14	8.5
MWSA0618-1R5MT	1.5	100k, 1.0V	26	12	8
MWSA0618-2R2MT	2.2	100k, 1.0V	35	8	7
MWSA0618-3R3MT	3.3	100k, 1.0V	50	6.5	4.5
MWSA0618-4R7MT	4.7	100k, 1.0V	62	5.0	4.0
MWSA0618-6R8MT	6.8	100k, 1.0V	110	4.5	3.0
MWSA0618-100MT	10	100k, 1.0V	155	4.0	2.3
MWSA0618-220MT	22	100k, 1.0V	350	2.3	1.8

MWSA0624 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0624-R22MT	0.22	100k, 1.0V	3.0	34	21
MWSA0624-R33MT	0.33	100k, 1.0V	4.1	24.5	18
MWSA0624-R47MT	0.47	100k, 1.0V	5.1	22	15
MWSA0624-R56MT	0.56	100k, 1.0V	6.5	17	13
MWSA0624-R68MT	0.68	100k, 1.0V	7.0	16	12
MWSA0624-1R0MT	1.0	100k, 1.0V	13.5	16	9.0
MWSA0624-1R5MT	1.5	100k, 1.0V	20	15	9.0
MWSA0624-2R2MT	2.2	100k, 1.0V	28	14	7.0
MWSA0624-3R3MT	3.3	100k, 1.0V	39	13	5.5
MWSA0624-4R7MT	4.7	100k, 1.0V	50	7.5	5.0
MWSA0624-6R8MT	6.8	100k, 1.0V	70	6.0	4.0
MWSA0624-100MT	10.0	100k, 1.0V	101	4.0	3.1
MWSA0624-150MT	15.0	100k, 1.0V	160	3.3	2.5
MWSA0624-220MT	22.0	100k, 1.0V	230	2.5	2.0

MWSA0603 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA0603-R10MT	0.10	100k, 1.0V	1.7	60	32.5
MWSA0603-R15MT	0.15	100k, 1.0V	2.5	52	26
MWSA0603-R20MT	0.20	100k, 1.0V	3.0	41	24
MWSA0603-R22MT	0.22	100k, 1.0V	3.0	34	24
MWSA0603-R24MT	0.24	100k, 1.0V	3.1	31	23
MWSA0603-R33MT	0.33	100k, 1.0V	3.5	26	21
MWSA0603-R47MT	0.47	100k, 1.0V	4.1	21	18
MWSA0603-R56MT	0.56	100k, 1.0V	4.5	19	16.5
MWSA0603-R68MT	0.68	100k, 1.0V	5.3	18	16
MWSA0603-R82MT	0.82	100k, 1.0V	6.0	17	14
MWSA0603-1R0MT	1.0	100k, 1.0V	7.4	16	12
MWSA0603-1R2MT	1.2	100k, 1.0V	12	20.0	10.0
MWSA0603-1R5MT	1.5	100k, 1.0V	12.1	14	12
MWSA0603-2R2MT	2.2	100k, 1.0V	15	13	9.5
MWSA0603-2R5MT	2.5	100k, 1.0V	22	14.	7.
MWSA0603-3R3MT	3.3	100k, 1.0V	22	10.5	8.5
MWSA0603-4R7MT	4.7	100k, 1.0V	33	6.5	6
MWSA0603-6R8MT	6.8	100k, 1.0V	48	6.3	5
MWSA0603-8R2MT	8.2	100k, 1.0V	60	6.0	5.0
MWSA0603-100MT	10	100k, 1.0V	67	5.5	4.5
MWSA0603-150MT	15	100k, 1.0V	115	4.5	3.0
MWSA0603-220MT	22	100k, 1.0V	200	3.0	2.3
MWSA0603-330MT	33	100k, 1.0V	310	2.5	2.0

MWSA1004C TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA1004C-R15MT	0.15	100k, 1.0V	0.65	75	45
MWSA1004C-R19MT	0.19	100k, 1.0V	0.8	46	40
MWSA1004C-R22MT	0.22	100k, 1.0V	1.0	60	35
MWSA1004C-R24MT	0.24	100k, 1.0V	1.05	44	33
MWSA1004C-R30MT	0.30	100k, 1.0V	1.1	50	35

MWSA1004C-R36MT	0.36	100k, 1.0V	1.2	45	30
MWSA1004C-R47MT	0.47	100k, 1.0V	1.7	40	30
MWSA1004C-R56MT	0.56	100k, 1.0V	1.8	33	25
MWSA1004C-R68MT	0.68	100k, 1.0V	2.4	30	23
MWSA1004C-R78MT	0.78	100k, 1.0V	2.6	20	22
MWSA1004C-R80MT	0.80	100k, 1.0V	2.7	29	23
MWSA1004C-1R0MT	1.0	100k, 1.0V	3.3	28	19
MWSA1004C-1R5MT	1.5	100k, 1.0V	4.2	24	16
MWSA1004C-1R8MT	1.8	100k, 1.0V	5.0	16	17
MWSA1004C-2R0MT	2.0	100k, 1.0V	5.8	14	16
MWSA1004C-2R2MT	2.2	100k, 1.0V	7.0	16.5	12
MWSA1004-2R2MT	2.2	100k, 1.0V	6.3	13	13
MWSA1004C-3R3MT	3.3	100k, 1.0V	11.8	16	11
MWSA1004C-4R7MT	4.7	100k, 1.0V	20	13	9.0
MWSA1004C-6R8MT	6.8	100k, 1.0V	25	12	8.5
MWSA1004C-8R2MT	8.2	100k, 1.0V	27	9	8.0
MWSA1004C-100MT	10	100k, 1.0V	30	8.5	7.8
MWSA1004C-150MT	15	100k, 1.0V	45	7	6.25
MWSA1004C-220MT	22	100k, 1.0V	66	5.5	5.0
MWSA1004C-330MT	33	100k, 1.0V	92	4.8	4.4
MWSA1004C-470MT	47	100k, 1.0V	145	3.5	3.3
MWSA1004C-680MT	68	100k, 1.0V	195	3	2.5
MWSA1004C-101MT	100	100k, 1.0V	270	2.25	2.0

MWSA1204 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA1204-R10MT	0.10	100k, 1.0V	0.96	84	43
MWSA1204-R15MT	0.15	100k, 1.0V	1.2	75	41
MWSA1204-R22MT	0.22	100k, 1.0V	1.3	65	38.5
MWSA1204-R33MT	0.33	100k, 1.0V	1.5	62	36.5
MWSA1204-R47MT	0.47	100k, 1.0V	2.0	55	32
MWSA1204-R60MT	0.60	100k, 1.0V	2.2	51	29
MWSA1204-R68MT	0.68	100k, 1.0V	2.5	49	28
MWSA1204-R82MT	0.82	100k, 1.0V	3.0	44	25
MWSA1204-1R0MT	1.0	100k, 1.0V	3.5	40	24
MWSA1204-1R5MT	1.5	100k, 1.0V	5.5	35	19
MWSA1204-1R8MT	1.8	100k, 1.0V	7	30	16.5
MWSA1204-2R2MT	2.2	100k, 1.0V	8	29	16
MWSA1204-3R3MT	3.3	100k, 1.0V	12	27	12
MWSA1204-4R7MT	4.7	100k, 1.0V	15	24	10
MWSA1204-5R6MT	5.6	100k, 1.0V	18	19	9.5
MWSA1204-6R8MT	6.8	100k, 1.0V	22	18	9
MWSA1204-8R2MT	8.2	100k, 1.0V	28	16	8.5
MWSA1204-100MT	10	100k, 1.0V	34	14	7

MWSA1205 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA1205-R10MT	0.10	100k, 1.0V	0.6	118	55
MWSA1205-R22MT	0.22	100k, 1.0V	0.8	110	51
MWSA1205-R33MT	0.33	100k, 1.0V	1.1	60	42
MWSA1205-R36MT	0.36	100k, 1.0V	0.85	50	42
MWSA1205-R47MT	0.47	100k, 1.0V	1.3	48	38
MWSA1205-R50MT	0.50	100k, 1.0V	1.15	48	38
MWSA1205-R56MT	0.56	100k, 1.0V	1.5	47	36

MWSA1205-R68MT	0.68	100k, 1.0V	1.55	46	33
MWSA1205-R82MT	0.82	100k, 1.0V	1.67	40	30
MWSA1205-1R0MT	1.0	100k, 1.0V	2.2	35	26
MWSA1205-1R2MT	1.2	100k, 1.0V	3.5	34	25
MWSA1205-1R5MT	1.5	100k, 1.0V	3.2	33	23
MWSA1205-1R8MT	1.8	100k, 1.0V	4.9	30	19
MWSA1205-2R2MT	2.2	100k, 1.0V	5.5	24	15
MWSA1205-3R3MT	3.3	100k, 1.0V	7	22	14
MWSA1205-4R7MT	4.7	100k, 1.0V	9	21	13
MWSA1205-5R6MT	5.6	100k, 1.0V	16.5	20	11.5
MWSA1205-6R8MT	6.8	100k, 1.0V	18	19	12
MWSA1205-7R8MT	7.8	100k, 1.0V	20.5	18	10
MWSA1205-8R2MT	8.2	100k, 1.0V	22.5	16	9.5
MWSA1205-100MT	10	100k, 1.0V	22	12	9
MWSA1205-150MT	15	100k, 1.0V	30	10	8
MWSA1205-220MT	22	100k, 1.0V	58	6.5	4.5
MWSA1205-330MT	33	100k, 1.0V	84	6.0	3.5
MWSA1205-470MT	47	100k, 1.0V	130	5.0	3.0

.MWSA1206 TYPE

Part Number	Inductance	L Test Condition	Max. DC Resistance	Typ. Saturation Current	Typ. Heat Rating Current
Units	μH	Hz, V	mΩ	A	A
Symbol	L	-	DCR	Isat	Irms
MWSA1206-R10MT	0.10	100k, 1.0V	0.5	120	60
MWSA1206-R15MT	0.15	100k, 1.0V	0.6	118	55
MWSA1206-R22MT	0.22	100k, 1.0V	0.7	112	53
MWSA1206-R30MT	0.30	100k, 1.0V	0.8	72	48
MWSA1206-R33MT	0.33	100k, 1.0V	0.9	65	46
MWSA1206-R40MT	0.40	100k, 1.0V	1.0	64	44
MWSA1206-R47MT	0.47	100k, 1.0V	1.2	63	41
MWSA1206-R56MT	0.56	100k, 1.0V	1.4	62	37
MWSA1206-R68MT	0.68	100k, 1.0V	1.6	60	35
MWSA1206-R82MT	0.82	100k, 1.0V	1.9	50	33
MWSA1206-1R0MT	1.0	100k, 1.0V	2.0	49	32
MWSA1206-1R2MT	1.2	100k, 1.0V	2.5	48	30
MWSA1206-1R5MT	1.5	100k, 1.0V	3.0	45	27
MWSA1206-1R8MT	1.8	100k, 1.0V	3.2	41	24
MWSA1206-2R2MT	2.2	100k, 1.0V	4.2	40	22
MWSA1206-3R3MT	3.3	100k, 1.0V	6.8	35	18
MWSA1206-4R7MT	4.7	100k, 1.0V	11.2	30	14
MWSA1206-5R6MT	5.6	100k, 1.0V	13.2	27	13.5
MWSA1206-6R8MT	6.8	100k, 1.0V	14	16.5	11.5
MWSA1206-8R2MT	8.2	100k, 1.0V	16	13.5	11
MWSA1206-100MT	10	100k, 1.0V	20.7	12.5	10
MWSA1206-120MT	12	100k, 1.0V	23	10	7
MWSA1206-150MT	15	100k, 1.0V	29	9	6
MWSA1206-180MT	18	100k, 1.0V	35	8	5
MWSA1206-220MT	22	100k, 1.0V	39.5	7.5	5
MWSA1206-270MT	27	100k, 1.0V	56	6.5	4
MWSA1206-330MT	33	100k, 1.0V	75	6	4
MWSA1206-470MT	47	100k, 1.0V	90	5.5	3.5
MWSA1206-680MT	68	100k, 1.0V	140	4.5	3
MWSA1206-101MT	100	100k, 1.0V	200	3.5	2.5
MWSA1206-121MT	120	100k, 1.0V	235	3.2	2.3
MWSA1206-151MT	150	100k, 1.0V	350	2.7	2