

Data Sheet

Customer:

Product: Shielded SMD Power Inductor – SDA..A Series

Sizes.: 0630

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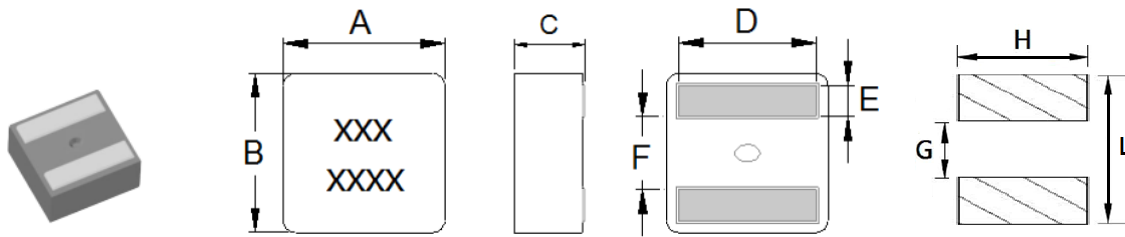
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Shielded SMD Power Inductor



Note: 1.The above PCB layout reference only.
2. Recommend solder paste thickness at 0.15mm and above.

■ Dimensions

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	L mm
SDA0630 (≥1R2)	7.2±0.2	6.9±0.2	2.8±0.2	See table	1.4±0.2	2.6±0.25	2.5	5.6	5.6
SDA0630 (≤1R5)			2.9±0.2						

■ Features

- Soft saturation
- High current , low DCR , high efficiency
- Very low acoustic noise and very low leakage flux noise
- High reliability
- 100% Lead(Pb)-Free and RoHS compliant
- High reliability -Reliability test complied to AEC-Q200

■ Inductance and rated current ranges

– SDA0630 0.18μH~4.5μH 36~8A

– Test equipment:

L: HP4284A LCR meter

DCR: Milli-ohm meter

■ Applications

- Note PC power system , incl. IMVP-6
- DC/DC converters

■ Characteristics

- Saturation Rated Current (I sat) : The DC current when the inductance becomes 30% lower than its initial value.
- Operating temperature range:-55~+125°C (Including self - temperature rise)
- The part temperature (ambient + temp rise) should not exceed 155°C under worst case operating conditions. Circuit design, component, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

■ Product Identification

SDA	0630	M	T	A	R18	A
Product Type	Dimensions (BxC)	Inductor Tolerance	Packaging Style	Material Code	Inductance	Function Code
	0630: 6.9x2.9	M: ±20%	T: Tape and Reel	A: A Material	R18: 0.18μH 1R0: 1.0μH	A: Automotive Grade

Shielded SMD Power Inductor

Electrical Characteristics

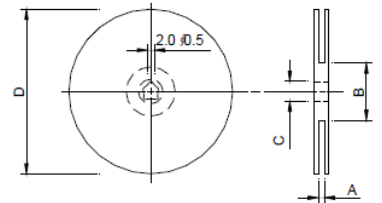
SDA0630..A Type

Part No.	Inductance (uH)	Tolerance	Test Condition	DCR (mΩ)		Isat (A)		I _{rms} (A) Typ		D (mm)
				Typ.	Max.	Typ.	Max.	ΔT 20°C	ΔT 40°C	
SDA0630□TAR18A	0.18	M	100KHz, 0.1V	1.60	1.75	40.0	36.0	24.0	32.0	5.30±0.3
SDA0630□TAR33A	0.33	M	100KHz, 0.1V	2.25	2.50	32.0	28.0	20.0	25.0	5.55±0.3
SDA0630□TAR56A	0.56	M	100KHz, 0.1V	3.00	3.31	29.0	25.0	17.0	22.0	5.30±0.3
SDA0630□TA1R0A	1.0	M	100KHz, 0.1V	5.50	6.05	23.0	18.0	13.0	18.0	5.20±0.3
SDA0630□TA1R2A	1.2	M	100KHz, 0.1V	6.70	7.40	22.0	16.0	12.0	16.0	5.15±0.3
SDA0630□TA1R8A	1.8	M	100KHz, 0.1V	9.20	10.2	18.2	13.0	10.0	14.0	5.10±0.3
SDA0630□TA2R2A	2.2	M	100KHz, 0.1V	11.0	12.2	15.9	11.0	7.0	10.0	5.05±0.3
SDA0630□TA3R3A	3.3	M	100KHz, 0.1V	18.8	20.8	12.2	9.00	6.0	8.0	5.00±0.3
SDA0630□TA4R5A	4.5	M	100KHz, 0.1V	23.0	25.3	10.0	8.00	5.0	7.0	5.00±0.3

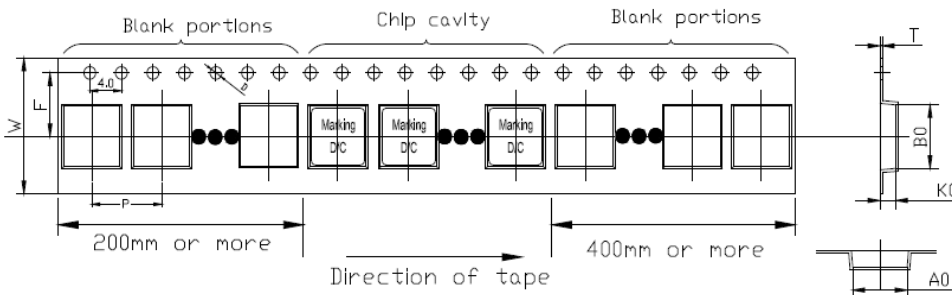
Packaging

Packing Quantity & Reel Specifications

Type	Packaging Quantity	Tape Width	Reel Diameter	A (mm)	B (mm)	C (mm)	D (mm)
SDA0630	1000	16mm	13 inch	16.4±2/-0	100±2	13±0.5/-0.2	330

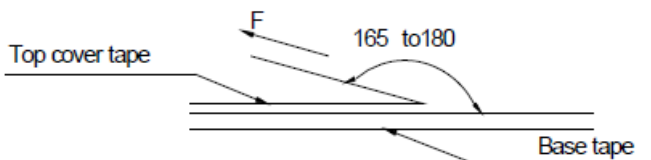


Tape Specifications



Type	B0 (mm)	A0 (mm)	K0 (mm)	P (mm)	W (mm)	F (mm)	T (mm)	D (mm)
SDA0630	7.3±0.1	7.6±0.1	3.3±0.1	12.0±0.1	16.0±0.3	7.5±0.1	0.35±0.1	1.5±0.1

- Peel force of top cover tape
- The peel speed shall be about 300mm/min
- The peel force of top cover tape shall be between 10gf to 130gf

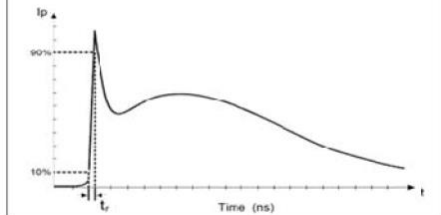
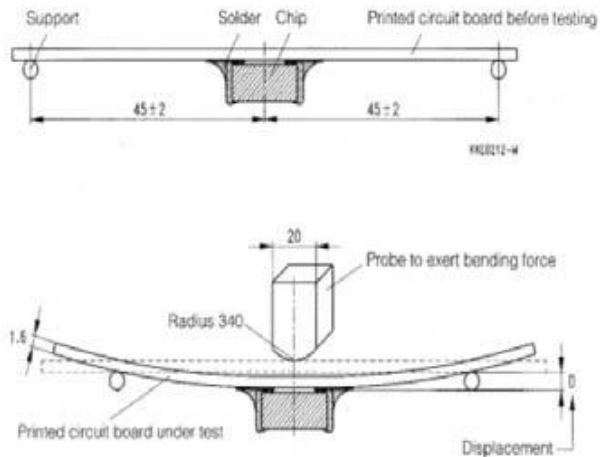
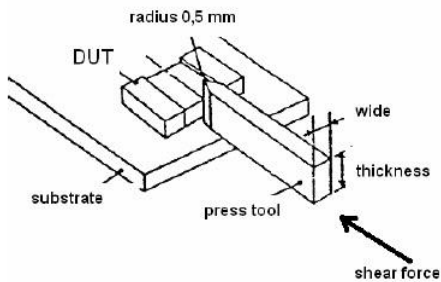


Shielded SMD Power Inductor

Environmental Characteristics

Item	Requirement	Test Method															
High temperature exposure (storage)	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020D Classification Reflow Profiles Temperature : 125±2°C (Inductor) Duration : 1000hrs Min. Measurement at 24±4 hours after test conclusion															
Temperature cycling		Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020DClassification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 30min Min.(Inductor) Step2 : 125±2°C transition time 1min MAX. Step3 : 125±2°C 30min Min. Step4 : Low temp. transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24±2 hrs															
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020DClassification Reflow Profiles 1.Baked at50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2.Raise temperature to 65±2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3.Raise temperature to 65±2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs,keep at 25°C for 2hrs then keep at -10°C for 3hrs 4.Keep at 25°C 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs.															
Biased Humidity		Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020D Classification Reflow Profiles Humidity : 85±3% R.H, Temperature : 85°C ±2°C Duration : 1000hrs Min with 100% rated current. Measured at room temperature after placing for24±2hrs															
High Temperature Operational Life		Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020D Classification Reflow Profiles Temperature : 125±2°C (Inductor) Duration : 1000hrs Min. with 100% rated current. Measured at room temperature after placing for24±2hrs															
External Visual	Appearance : No damage	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage	Add aqueous wash chemical - OKEM clean or equivalent															
Mechanical Shock	Appearance : No damage. Inductance : within±10% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	<table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SDM</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> shocks in each direction along 3 perpendicular axes	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SDM	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type		Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec												
SDM		100	6	Half-sine	12.3												
Lead		100	6	Half-sine	12.3												
Vibration	IPC/JEDEC J-STD-020D Classification Reflow Profiles Oscillation Frequency: 10~2K~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:1.52mm±10% Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)																
Resistance to soldering Heat	Test condition: <table border="1"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260±5(solder)</td> <td>10±1</td> <td>25mm/s±6mm/s</td> <td>1</td> </tr> </tbody> </table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260±5(solder)	10±1	25mm/s±6mm/s	1								
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles														
260±5(solder)	10±1	25mm/s±6mm/s	1														
Thermal shock	Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020DClassification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 15±1min(Inductor) Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing fo24±2hrs																

Shielded SMD Power Inductor

<p>ESD</p>	<p>Appearance : No damage</p>	
<p>Solderability</p>	<p>More than 95% of the terminal electrode should be covered with solder</p>	<p>Steam Aging: 8 hours ± 15 min Preheat: 150°C, 60sec. Solder: Sn96.5% Ag3% Cu0. 5% Temperature: 245±5°C ° Flux for lead free: Rosin. 9.5% ° Dip time: 4±1sec. Depth: completely cover the termination</p>
<p>Electrical Characterization</p>	<p>Refer Specification for Approval</p>	<p>Summary to show Min, Max, Mean and Standard deviation</p>
<p>Flammability</p>	<p>Electrical Test not required</p>	<p>V-0 or V-1 are acceptable</p>
<p>Board Flex</p>	<p>Appearance : No damage</p>	<p>Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020D Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board</p> 
<p>Terminal Strength(SMD)</p>	<p>Appearance : No damage</p>	<p>Preconditioning: Run through IR reflow for 2 times. IPC/JEDEC J-STD-020D Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested</p> 

Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition

■ Soldering and Mounting

Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. Viking terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

Solder re-flow:

Recommended temperature profiles for re-flow soldering in Figure 1.

Soldering Iron

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

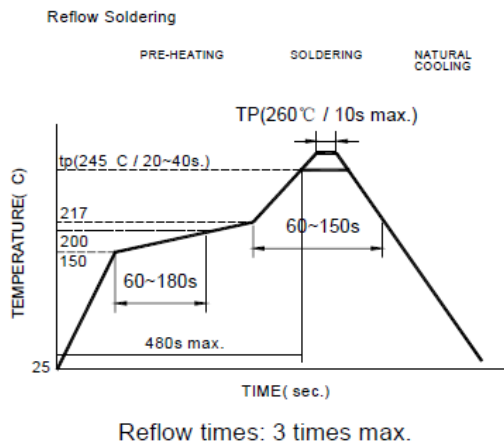


Fig.1

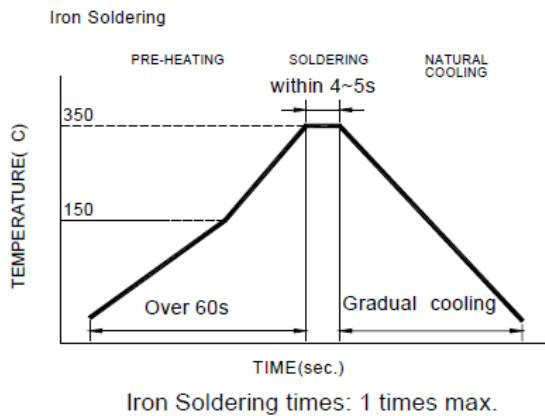


Fig.2

Shielded SMD Power Inductor

Appearance Criterion

PAD residual powder、imprinting

The residual powder on both side of pad is norm and within following criteria are acceptable

The imprinting mark below the part, are norm in manufacturing process and does not affect the function and it is acceptable.

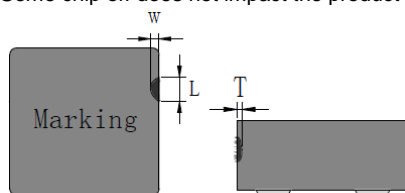
Front lit imprinting is acceptable.

Foreign materials on the product body is inevitable and accepted.

a	10% max of the length of pad.
b	5% of the area on one single pad.
t	0.08mm max.

Defects

Chip off is generated during molding and manufacturing process.
 Chip off acceptance limits subjected to the product size.
 Our current Defect limit is based on the IPC-A-610.
 Some chip off does not impact the product function, see the IPC standard 1 & 2.



T	25 % of the thickness
W	25 % of the width
L	50 % of the length

Defects usually occur at the corners and edges of the product, There will be a slight defect black and rough, but not exposed copper, and does not affect the product performance and reliability.

Crack

Production process of cracks appearing in the body is inevitable, some slight crack is caused because the molding, is not oxidized, crack on the product will not affect product performance. We have done a reliability test of crack products, even if cracks is more than 0.13mm also will not affect the electrical properties of the product, crack limits as follows



Severely crack: not acceptable.
 More obvious cracks extended from side to side.



Moderate crack: not acceptable.
 Very obvious and may result in powder come off and exposed of copper wire.



Slight crack: acceptable.

Products from a slight crack in the baking process due to thermal expansion, and it is not obvious by visual inspection.

Oxidation(rust)

the contains iron composite, although the resin has a protective effect of oxidation, but there will be small amount of product that may occur oxidation. it is recommend that customer use this product in humidity controlled environment. The basic steps should be to protect the surface oxidation, including the sealed packages to PCB mount inductors. To avoid the adverse effects caused by oxidation, Oxidation occurs at the surface only allows the internal oxidation is not allowed, oxidized surface will not affect the reliability of the product



4sides slightly oxidized side:
 Acceptable



Top and bottom slightly oxidized side:
 Acceptable



Ps: Spray printing effect :
 can be accepted if recognizable