Form No: S107-7-0000-W09100653

Specification for Approval

Date: 2009/10/26

Customer :

TAI-TECH P/N: SMPI 0603HW-Series-K01

CUSTOMER P/N:

DESCRIPTION:

QUANTITY: pcs

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TAI-TECH Advanced Electronics Co., Ltd

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SMD Type Ultra High Current Power Inductors

SMPI 0603HW-Series-K01

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	09/10/26	新 發 行	謝明機	葉玉美	徐琪雅
備 註					

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SMD Type Ultra High Current Power Inductors

SMPI 0603HW-Series-K01

1. Features

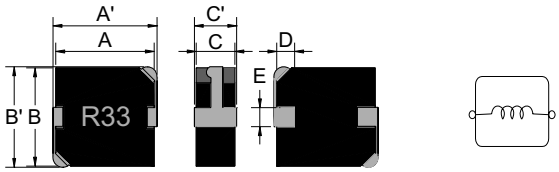
1. Lowest height in this package footprint.
2. Shielded construction.
3. Lowest DCR/μH, in this package size.
4. Handles high transient current spikes without saturation.
5. Ultra low buzz noise, due to composite construction.
6. Frequency up to 5MHz.
7. 100% Lead(Pb)-Free and RoHS compliant.

Pb-free

2. Applications

Excellent for power line DC-DC conversion applications used in power switching, personal computers and other handheld electronic equipment.

3. Dimensions



Series	A(mm)	A'(mm)	B(mm)	B'(mm)	C(mm)	C'(mm)	D(mm)	E(mm)
SMPI 0603	6.86±0.5	7.8 max.	6.47±0.5	7.0 max.	3.0 max.	3.2 max.	1.6±0.5	2.1±0.5

4. Part Numbering

SMPI	0603	HW	-	R33	M	-	K01
A	B	C		D	E		F

A: Series
B: Dimension — AxC
C: Type
D: Inductance — R33=0.33 uH
E: Inductance Tolerance — M=±20%; Coating Black, Marking White
F: Control S/N

5. Specification

Part Number	Inductance L0 (uH)±20% @ 0 A	I rms (A) typ.	I sat (A) typ.	DCR (mΩ) max.
SMPI 0603HW-R33M-K01	0.33	20.0	30	3.9
SMPI 0603HW-R47M-K01	0.47	17.5	26	4.2
SMPI 0603HW-R68M-K01	0.68	15.5	23	5.5
SMPI 0603HW-1R0M-K01	1.0	11.0	16	10
SMPI 0603HW-1R5M-K01	1.5	9.0	14	15
SMPI 0603HW-2R2M-K01	2.2	8.0	12	20
SMPI 0603HW-3R3M-K01	3.3	6.0	10	30
SMPI 0603HW-4R7M-K01	4.7	5.5	6.5	40
SMPI 0603HW-6R8M-K01	6.8	4.5	6.0	60
SMPI 0603HW-100M-K01	10.0	3.0	4.5	105

Note:

1. Test frequency : L0: 100KHz / 1.0V
2. All test data referenced to 20℃ ambient.
3. Testing Instrument : L: HP4284A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER.
4. Heat Rated Current (Irms) will cause the coil temperature rise approximately △T=40℃ without core loss.
5. Saturation Current (Isat) will cause L0 to drop approximately 20% typical.
6. The part temperature (ambient + temp rise) should not exceed 125℃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.
7. Special inquiries besides the above common used types can be met on your requirement.

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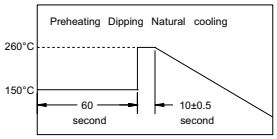
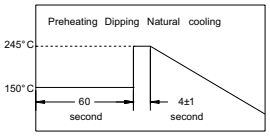
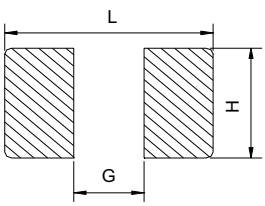
6. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-55~+125℃	
Storage temperature and Humidity range	-15~+40℃；50~60%RH	
Electrical Performance Test		
Inductance	Refer to standard electrical characteristics list.	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter.
DCR		CH16502,Agilent33420A Micro-Ohm Meter.
Saturation Current (Isat)	△L=20%	Saturation Current (Isat) will cause L0 to drop approximately △L(%).
Heat Rated Current (Irms)	△T=40℃	Heat Rated Current (Irms) will cause the coil temperature rise approximately △T(℃) without core loss. 1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer
Solder Heat Resistance	Appearance:No significant abnormality. Inductance change:Within ± 20%. 	Preheat:150℃,60sec. Solder: Sn99.95-Cu0.05 Solder tamperature:260±5℃ Flux for lead free: rosin Dip time:10±0.5sec.
Solderability Test	More than 90% of the terminal electrode should be covered with solder. 	Preheat:150℃,60sec. Solder: Sn99.95-Cu0.05 Solder tamperature:245±5℃ Flux for lead free: rosin Dip time:4±1sec.
Reliability Test		
High Temperature Life Test	Appearance: no damage. Inductance: within±20%of initial value. No disconnection or short circuit.	Temperature:125±5℃. Duration:500±12hrs. Measured at room temperature after placing for 2 to 3hrs.
Low Temperature Life Test	Appearance: no damage. Inductance: within±20%of initial value. No disconnection or short circuit.	Temperature:-55±5℃. Duration:500±12hrs. Measured at room temperature after placing for 2 to 3hrs.
Thermal shock	Appearance: no damage. Inductance: within±20%of initial value. No disconnection or short circuit. Step / Temp(℃) / Time(min.) 1 / -55±3℃ / 30±3 2 / room temp. / within3 3 / +125±3℃ / 30±3 4 / room temp. / within3	Condition for 1 cycle Step1:-55±3℃ 30±3 min. Step2:Room temperature within 3 min. Step3:+125±3℃ 30±3 min. Step4: Room temperature within 3 min.. Number of cycles:5 Measured at room temperature after placing for 2 to 3 hrs.
Humidity Resistance	Appearance: no damage. Inductance: within±20%of initial value. No disconnection or short circuit.	Humidity:90~95%RH. Temperature:40±5℃. Applied current:rated current. Duration:500±12hrs. Measured at room temperature after placing for 2 to 3hrs.
Random Vibration Test	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Impedance: within±30%	Frequency: 10-55-10Hz for 1 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 2 hours. A period of 2 hours in each of 3 mutually perpendicular directions (Total 6 hours).

7. Soldering and Mounting

7-1. Recommended PC Board Pattern



Chip size	L(mm)	G(mm)	H(mm)
SMPI 0603	8.7	3.7	3.5

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7-2. 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. TAI-TECH terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

7-2.1 Solder re-flow:

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

7-2.2 Soldering Iron(Figure 2):

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℃
- 280℃ tip temperature (max)
- Never contact the ceramic with the iron tip
- 1.0mm tip diameter (max)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 3 sec.

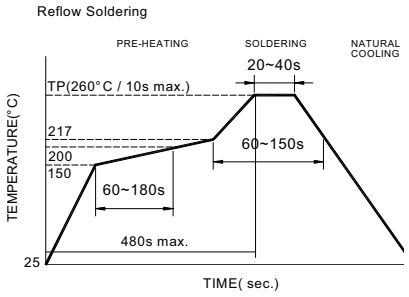


Fig.1

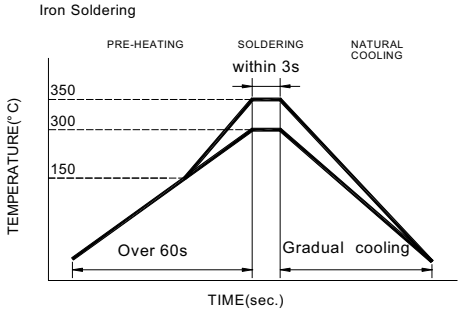
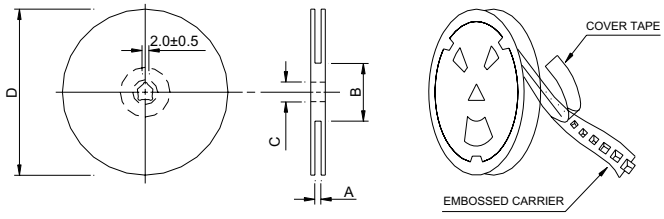


Fig.2

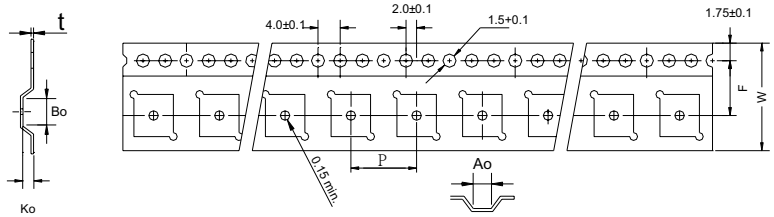
8. Packaging Information

8-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x16mm	16.0±0.5	100±2	13.5±0.5	330

8-2. Tape Dimension



Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	W(mm)	F(mm)	t(mm)
SMPI	0603	7.9±0.1	7.1±0.1	3.3±0.1	12.0±0.1	16±0.3	7.5±0.1	0.35±0.05

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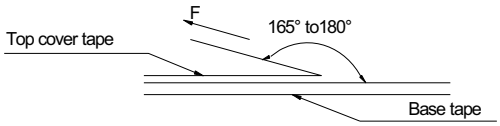
8-3. Packaging Quantity

SMPI	0603
Chip / Reel	1000
Inner box	2000
Carton	8000

8-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 grams in the arrow direction under the following conditions.

Room Temp. (℃)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

Application Notice

- Storage Conditions
  To maintain the solderability of terminal electrodes:
  1. Temperature and humidity conditions: Less than 30℃ and 70% RH.
  2. Recommended products should be used within 6 months form the time of delivery.
  3. The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
  1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
  2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
  3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

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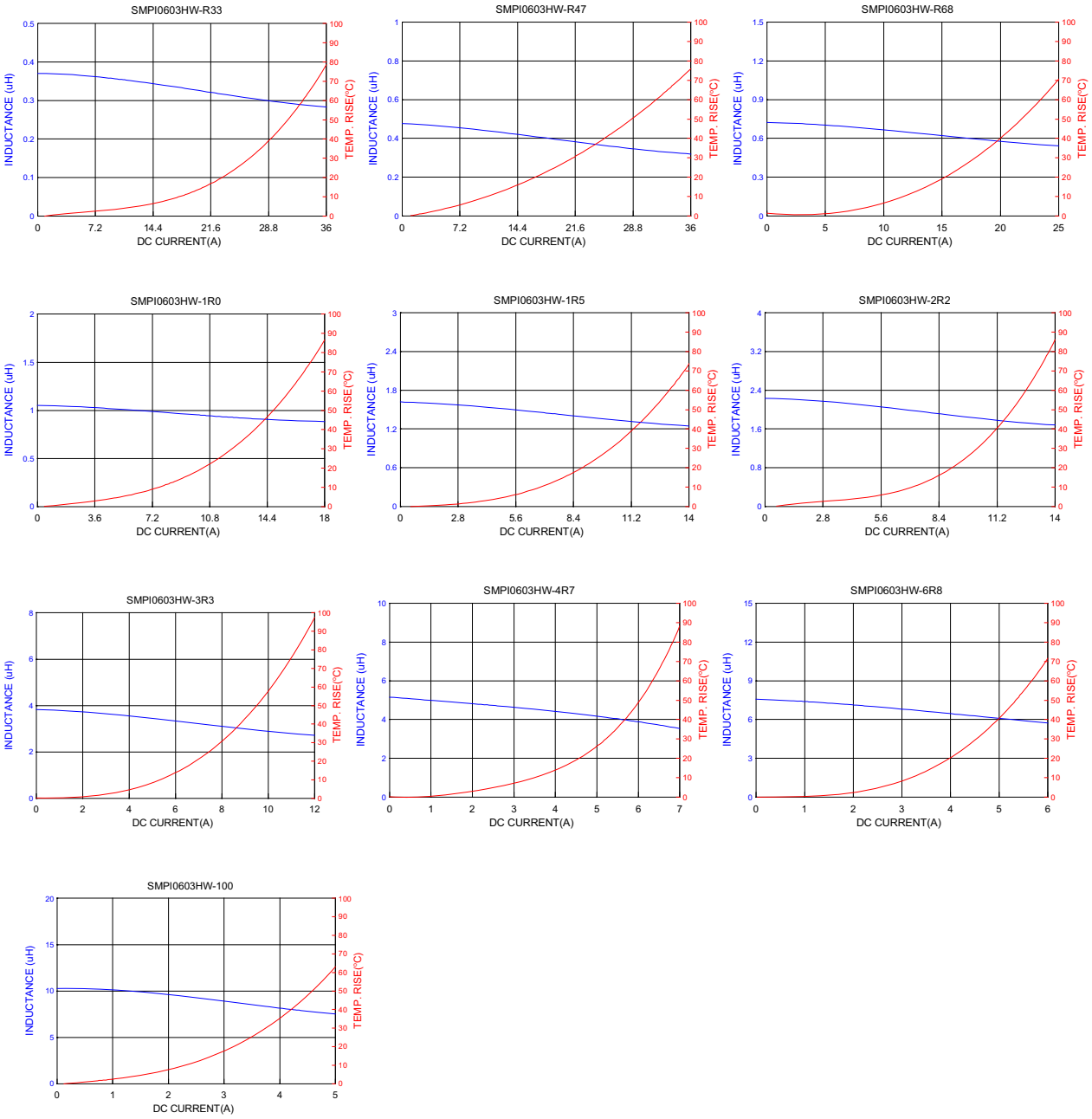
9. Typical Performance Curves

a、 Inductance vs. DC Current
Test Cont.:CH3302+1320+1320S (100KHz/1V)



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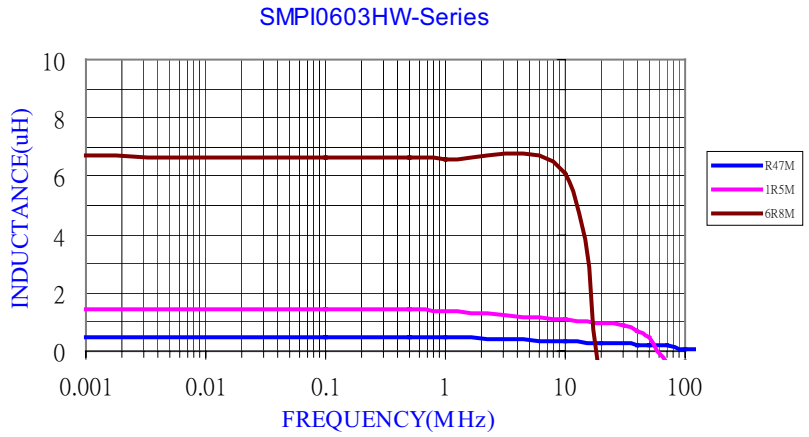
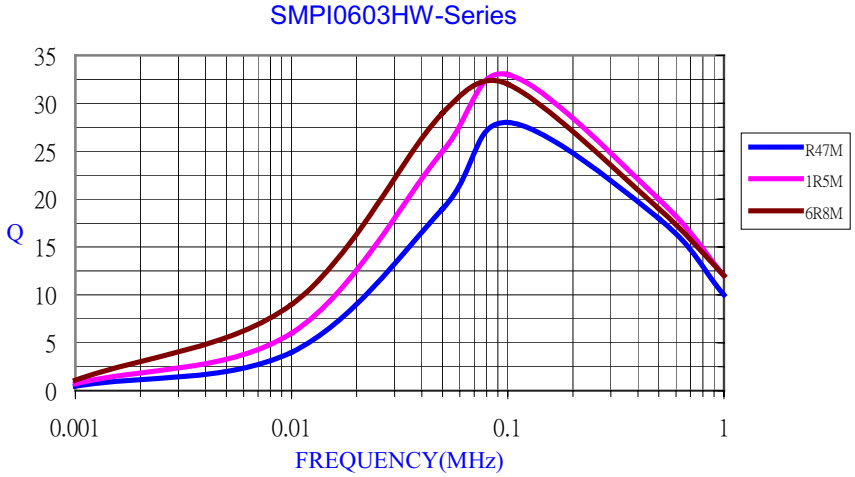
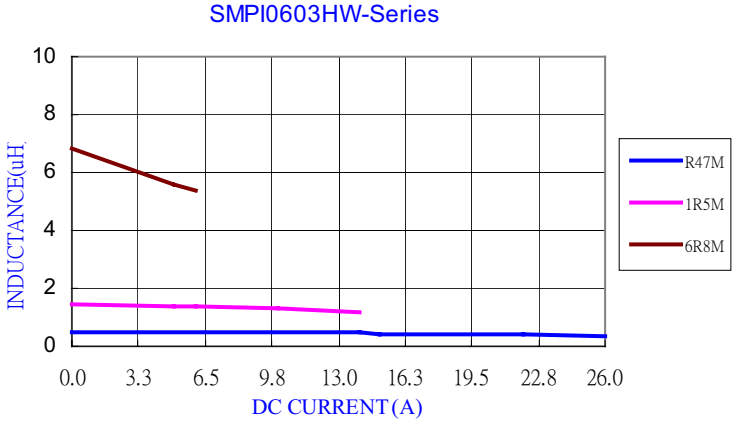
b、Inductance vs. Frequency
Test Cont.:HP4284A/1V(≦1MHz) ；HP4291B/1V (＞1MHz)



c、Q Value vs. Frequency
Test Cont.:HP4284A/1V(≦1MHz) ；HP4291B/1V (＞1MHz)



d、Inductance vs. DC Current
Test Cont.:CH3302+1320+1320S (100KHz/1V)



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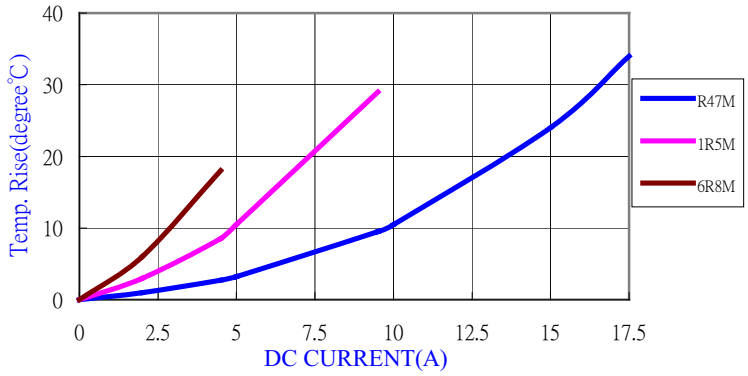
e、Temperature Rise(Δt) vs. DC Current

Test Cont.:CH3302+1320+1320S (100KHz/1V)

SMPI0603HW-Series



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