

ITEM P/N	TPMC1002H-SERIES	TEST INSTRUMENT	HP4284 / CH16502 Equality
PRODUCT	SMD Inductor	TEST FREQUENCY	100 kHz / 1.0V

CUSTOMER :

CUSTOMER P/N :

DESCRIPTION : SMD INDUCTOR

SINKA P/N : TPMC1002H-SERIES

REVISION NO. : 01

DATE : 2020/5/8

NOTES : STANDARD

DOCUMENTED BY	
APPROVED	Y Imai
CHECKED	Cosby Liu
PREPARED	Wenny Wei

CUSTOMER APPROVAL

company seals

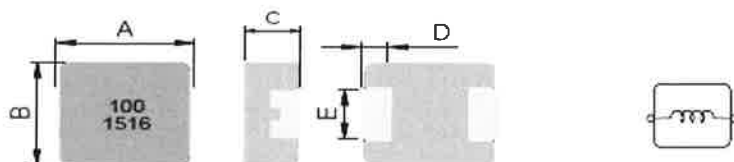
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1. Features

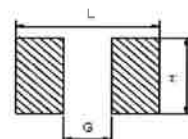
1. Carbonyl Powder.
2. Compact design.
3. High current · low DCR · high efficiency.
4. Very low acoustic noise and very low leakage flux noise.
5. High reliability.
6. 100% Lead(Pb)-Free and RoHS compliant.

2. Applications

Note PC power system · incl. IMVP-6
DC/DC converter .

3. Dimensions

leadframe

Recommend PC Board Pattern

L(mm)	G(mm)	H(mm)
13.6	5.4	3.5

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

Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
TMPC1004H	leadframe	11.0±0.5	10.0±0.3	3.8 ±0.2	2.3±0.3	3.0±0.3

4. Part Numbering

A: Series
B: Dimension
C: Type
D: Inductance
E: Inductance Tolerance
F: D/C

BxC
Carbonyl Powder,
100=10.0uH
M=±20%
印字:黑色,100 及 D/C 1516 (15年,16週期)(依實際生產日期而定)

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5.Specification

Parts No	Inductance L(0) ± 20% @0A	I _{rms} (A)		I _{sat} (A)		DCR (mΩ)	
		Typ	Max	Typ	Max	Typ	Max
TMPC1002H-1R0MG-D	1.0	8.5	7.5	26	20	15	18
TMPC1002H-1R5MG-D	1.5	8.0	7.0	23	18	21	25
TMPC1002H-2R2MG-D	2.2	7.0	6.0	19	18	27	32
TMPC1002H-3R3MG-D	3.3	5.5	4.5	16	14	44	52
TMPC1002H-4R7MG-D	4.7	5.0	4.0	14	12	54	64
TMPC1002H-6R7MG-D	6.7	4.0	3.5	11	9	63	73
TMPC1002H-8R2MG-D	8.2	3.2	2.7	9	7	90	105

Note:

1. Test frequency : L = 100kHz / 1.0V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument : L: HP4284A, CH11025, CH3302, CH1320 , CH13208 LCR METER / Rdc: CH16502, Agilent33430A MICRO OHMMETER.
4. Heat Rated Current (I_{rms}) will cause the coil temperature rise approximately Δt of 40°C (keep 1min.).
5. Saturation Current (I_{sat}) will cause LD to drop approximately 30%.
6. The part temperature (ambient + temp rise) should not exceed 125°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.
7. Special inquiries besides the above common used types can be met on your requirement.

ITEM P/N

TMPC1002H-SERIES

TEST INSTRUMENT

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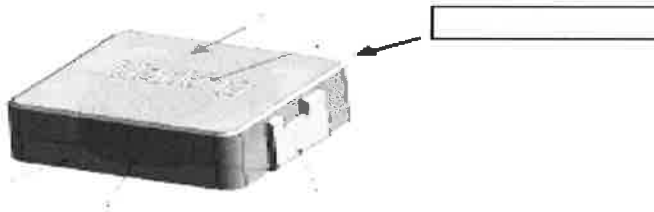
PRODUCT

SMD Inductor

TEST FREQUENCY

100 kHz / 1.0V

6. Material List

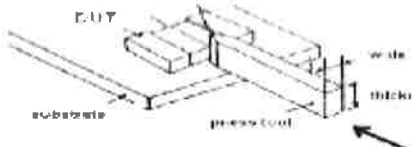


NO	Items	Materials
1	Core	Carbonyl Powder
2	Wire	Polyester Wire or equivalent
3	Clip	100% Pb free solder (Ni+Sn—Plating)
4	Ink	Halogen-free ketone
5	paint	Epoxy resin

7. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125°C (including self-temperature rise)	
Storage temperature	1: -10~+40°C, 50~60%RH (Product without taping) 2: -40~+125°C (on board)	
Electrical Performance Test		
Inductance	Refer to standard electrical characteristics list	HP4284A, CH11025, CH3902, CH1300, CH1305 LCR Meter
QCR		CH16502, Agilent33430A, Micro-Ohm Meter
Saturation Current (Isat)	Approximately \pm 130%	Saturation DC Current (Isat) will cause LQ to drop Δ L(%)>10% quickly.
Heat Rated Current (Irms)	Approximately \pm 140%	Heat Rated Current (Irms) will cause the coil temperature rise Δ T(°C) without core loss. 1. Applied the allowed DC current (keep 1 min.). 2. Temperature measured by digital surface thermometer
Reliability Test		
Life Test	Appearance : No damage Inductance : within 10% of initial value Q : Shall not exceed the specification value RDC : within \pm 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 \pm 2°C (Inductor) Applied current : rated current Duration : 1000 \pm 12hrs Measured at room temperature after placing for 24 \pm 2 hrs
Load Humidity		Preconditioning: Run through IR reflow for 2 times / IPC/JEDEC J-STD-020D Classification Reflow Profiles Humidity : 85 \pm 2% R.H. Temperature : 85°C \pm 2°C Duration : 1000hrs Min, with 100% rated current Measured at room temperature after placing for 24 \pm 2 hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times / IPC/JEDEC J-STD-020D Classification Reflow Profiles 1. Baked at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 55 \pm 2°C, 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2 hrs. 3. Raise temperature to 55 \pm 2°C, 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2 hrs 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
Thermal shock		Preconditioning: Run through IR reflow for 2 times / IPC/JEDEC J-STD-020D Classification Reflow Profiles Condition for 1 cycle Step1: -40 \pm 2°C, 30 \pm 5min Step2: 25 \pm 2°C, 40 \pm 5min Step3: 125 \pm 2°C, 30 \pm 5min Number of cycles : 500 Measured at room temperature after placing for 24 \pm 2 hrs
Vibration		Oscillation Frequency: 10 ~ 2K ~ 10Hz for 20 minutes Equipment : Vibration checker Total Amplitude: 1.52mm/10% Testing Time : 12 hours/20 minutes, 12 cycles each of 3 orientations

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Item	Performance	Test Condition															
Shock	Appearance : No damage Inductance : within $\pm 10\%$ of initial value Q : Shall not exceed the specification value. RDC : within $\pm 15\%$ 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 (0) (ms)</th> <th>Wave form</th> <th>Velocity change (V)/ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>1500</td> <td>0.5</td> <td>Half-sine</td> <td>15.4</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table>	Type	Peak value (g's)	Normal duration (0) (ms)	Wave form	Velocity change (V)/ft/sec	SMD	1500	0.5	Half-sine	15.4	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (0) (ms)	Wave form	Velocity change (V)/ft/sec													
SMD	1500	0.5	Half-sine	15.4													
Lead	100	6	Half-sine	12.3													
Bending	Appearance : No damage Inductance : within $\pm 10\%$ of initial value Q : Shall not exceed the specification value. RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions: \rightarrow 0805:40x100x1.2mm \rightarrow 0805:40x100x0.8mm Bending depth: \rightarrow 0805:1.2mm \rightarrow 0805:0.8mm duration of 10 sec.															
Solderability	More than 95% of the terminal electrode should be covered with solder.	Preheat: 150) : 60sec. + Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245 \pm 5 C + Flux for lead free: Rosin, 9.5% + Dip time: 4 \pm 1sec + Depth: completely cover the termination															
Resistance to Soldering Heat	Appearance : No damage Inductance : within $\pm 10\%$ of initial value Q : Shall not exceed the specification value. RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value	Number of heat cycles: 1 <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Time (s)</th> <th>Temperature ramp/immersion and emersion rate</th> </tr> </thead> <tbody> <tr> <td>250 \pm5 (solder temp)</td> <td>10 \pm1</td> <td>25mm/s \pm 5 mm/s</td> </tr> </tbody> </table>	Temperature (°C)	Time (s)	Temperature ramp/immersion and emersion rate	250 \pm 5 (solder temp)	10 \pm 1	25mm/s \pm 5 mm/s									
Temperature (°C)	Time (s)	Temperature ramp/immersion and emersion rate															
250 \pm 5 (solder temp)	10 \pm 1	25mm/s \pm 5 mm/s															
Terminal Strength	Appearance : No damage Inductance : within $\pm 10\%$ of initial value Q : Shall not exceed the specification value. RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times / IPC/JEDEC J-STD-0200 Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a force (\rightarrow 0805:1kg, \leftarrow 0805:0.5kg) to the side of a device being tested. This force shall be applied for 60 \pm 1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 															

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

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8. Soldering and Mounting

(1) 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. TAIPAQ 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.

(2) Solder re-flow:

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

(3) 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.

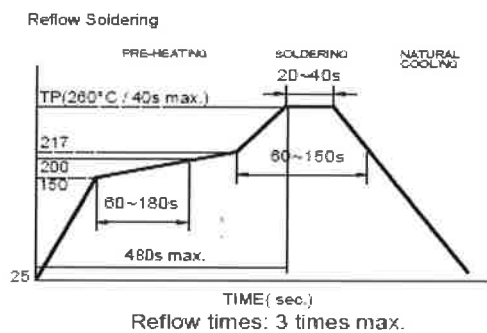


Fig.1

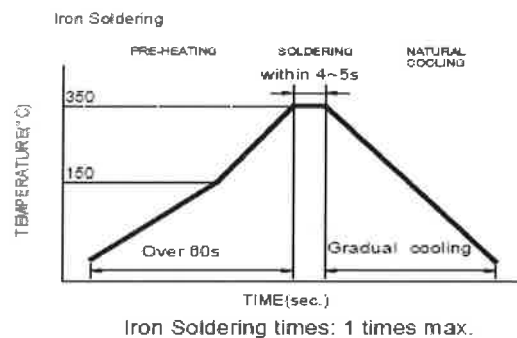


Fig.2