SMD Power Inductor
Low Profile, High Current Type

PIW-804065

MERITEK

FEATURE

- Magnetic Shield Construction for Power Circuit.
- Large Current and Low DC Resistance
- Low Profile Power Inductors
- Application: DC/DC Converter, Battery Powered Devices, Low Profile High Current Power Supply, Notebook/Server

RoHS

ELECTRICAL CHARACTERISTICS

Part Number	Inductance (µH)	Tolerance (%)	Test Frequency (Hz)	DCR ±20% (mΩ)	I_{SAT} (A)	I_{RMS} (A)
PIW1R0M804065	1.00	±20%	1V/1M	8.2	13.00	8.00
PIW1R4M804065	1.40	±20%	1V/1M	10.0	11.20	7.80
PIW1R5M804065	1.50	±20%	1V/1M	10.0	11.00	7.70
PIW2R2M804065	2.20	±20%	1V/1M	11.5	9.20	6.90
PIW3R3M804065	3.30	±20%	1V/1M	15.0	7.50	6.20
PIW3R6M804065	3.60	±20%	1V/1M	15.0	7.00	6.00
PIW4R7M804065	4.70	±20%	1V/1M	19.5	6.00	5.30
PIW5R6M804065	5.60	±20%	1V/1M	22.0	5.80	5.20
PIW6R8M804065	6.80	±20%	1V/1M	25.0	5.10	5.00
PIW100M804065	10.0	±20%	1V/1M	33.0	4.30	4.20
PIW150M804065	15.0	±20%	1V/1M	50.0	3.60	3.20
PIW220M804065	22.0	±20%	1V/1M	73.0	2.80	2.45
PIW330M804065	33.0	±20%	1V/1M	100	2.10	2.10
PIW470M804065	47.0	±20%	1V/1M	135	1.90	1.70
PIW560M804065	56.0	±20%	1V/1M	160	1.60	1.60
PIW680M804065	68.0	±20%	1V/1M	205	1.50	1.50
PIW820M804065	82.0	±20%	1V/1M	230	1.40	1.30
PIW101M804065	100	±20%	1V/1M	300	1.20	1.10
PIW121M804065	120	±20%	1V/1M	350	1.10	1.00
PIW151M804065	150	±20%	1V/1M	410	1.03	0.90
PIW181M804065	180	±20%	1V/1M	490	0.94	0.83
PIW221M804065	220	±20%	1V/1M	610	0.90	0.76
PIW331M804065	330	±20%	1V/1M	850	0.70	0.66
PIW471M804065	470	±20%	1V/1M	1300	0.55	0.58
PIW681M804065	680	±20%	1V/1M	2200	0.50	0.55

Notes:
1. All test data referenced to 25˚C ambient.
2. Saturation Current (Isat) based on inductance drop (ΔL/L0: ≦30%) approximately
3. Heat Rated Current (Irms) based on temperature rise (ΔT: 40 ˚C) approximately
4. Operating Temperature: -55ºC ~ +125ºC (Including Self-temperature rise)

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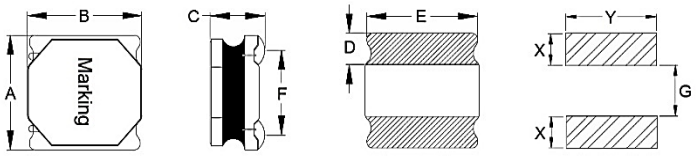
DIMENSIONS

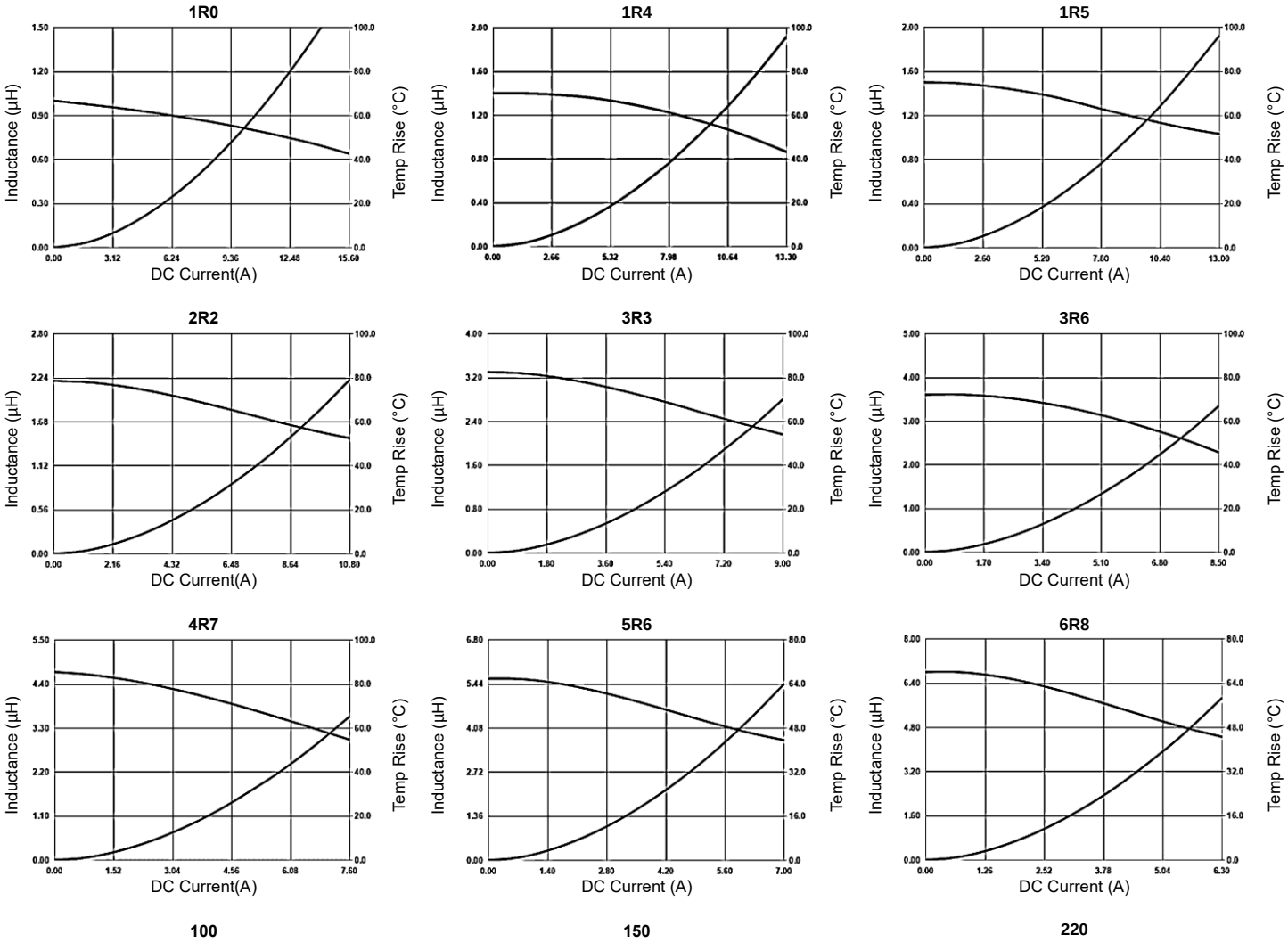


Unit: mm

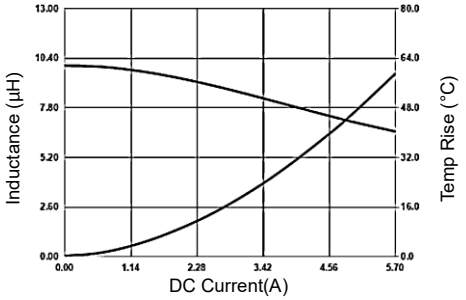
Size Code	A	B	C	D	E	F	X	Y	G
8040 (< 1.0 µH)	8.0±0.3	8.0±0.3	4.2 Max	2.4±0.3	6.3±0.3	--	2.85	6.6	2.8
8040 (≥ 1.0 µH)	8.0±0.3	8.0±0.3	3.7±0.3	2.4±0.3	6.3±0.3	--	2.85	6.6	2.8

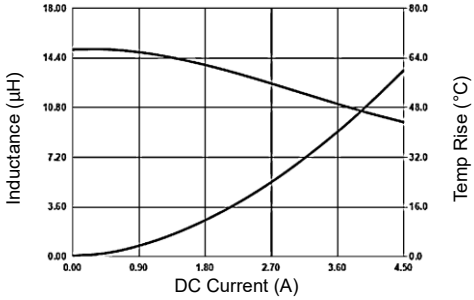
Notes:
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.15mm and above.

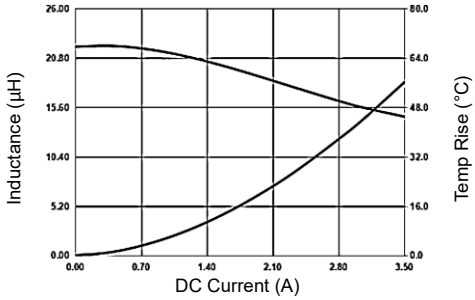
CHARACTERISTIC CURVES- PIW-804065 Series



100 150 220







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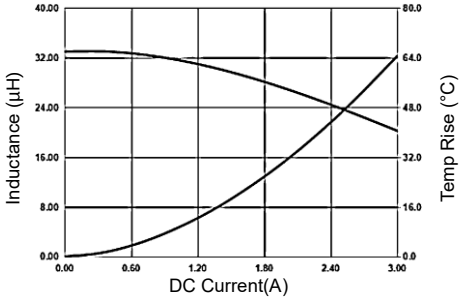

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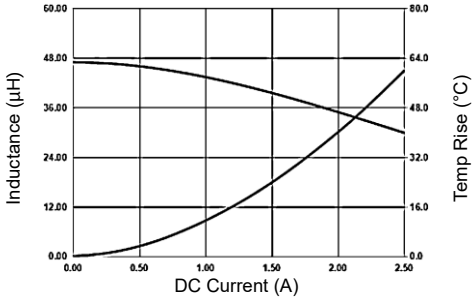

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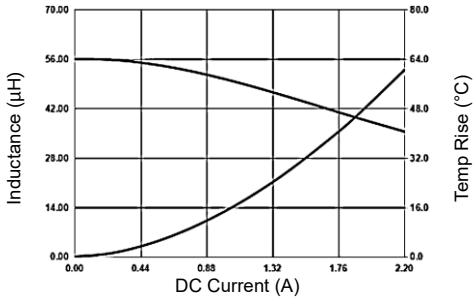
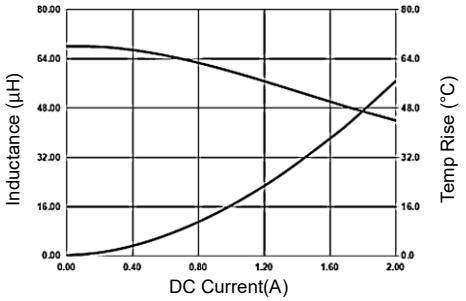


CHARACTERISTIC CURVES- PIW-804065 Series

680



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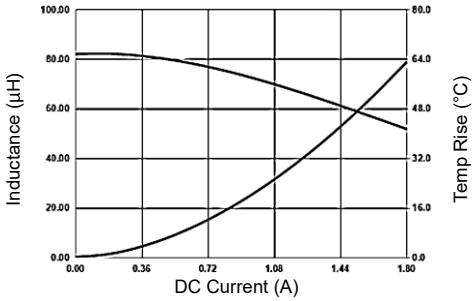

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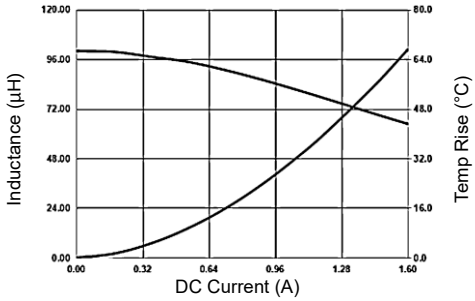

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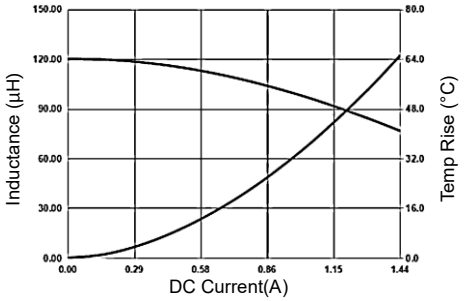

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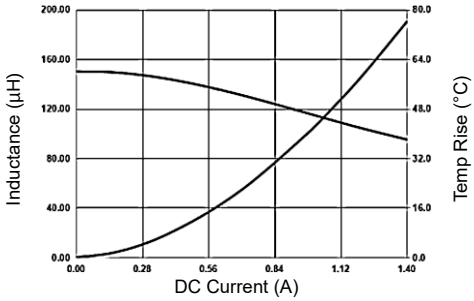

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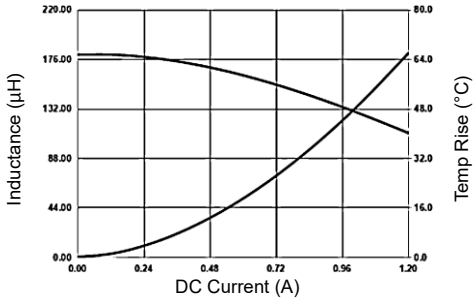

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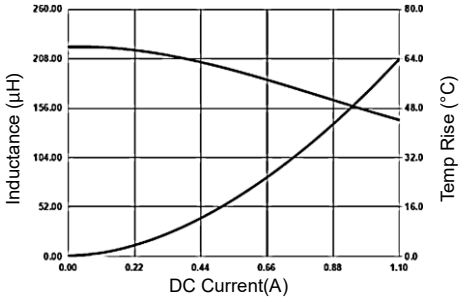

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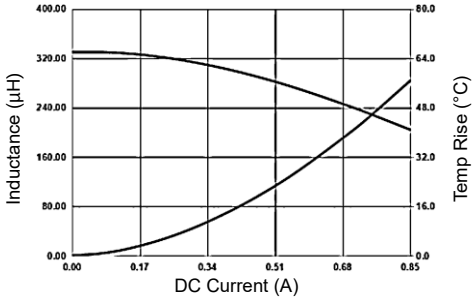

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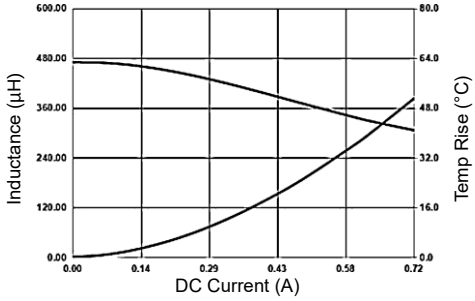
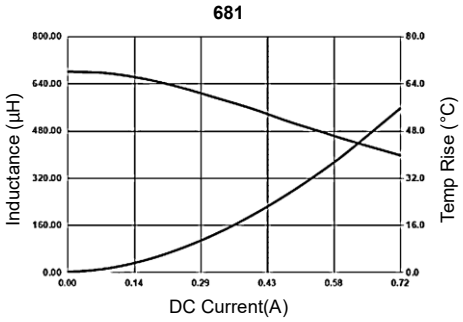
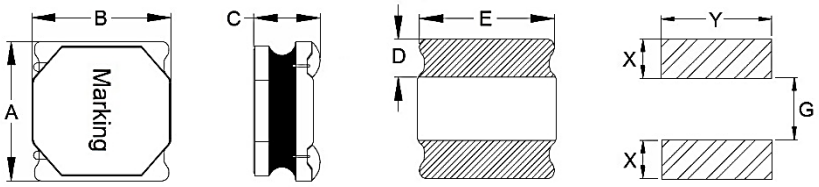



681
800.00
640.00
480.00
320.00
160.00
0.00
80.0
64.0
48.0
32.0
16.0
0.0
0.00
0.14
0.29
0.43
0.58
0.72
Inductance (µH)
Temp Rise (°C)
DC Current(A)

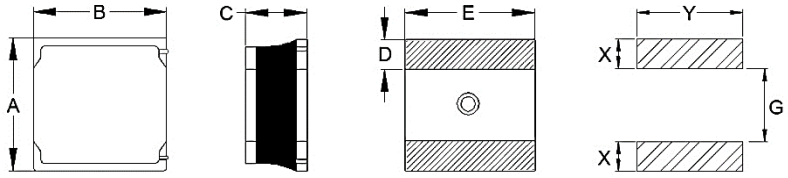
DIMENSIONS- PIW-65 SERIES



(Unit: mm)

Size Code	A	B	C	D	E	X	Y	G
4018	4.0 ± 0.2	4.0 ± 0.2	1.8 max	1.2 ref	--	1.2	3.7	1.6
4018B	4.0 ± 0.2	4.0 ± 0.2	1.8 max	1.1 ± 0.2	--	1.2	3.7	1.6
5020	5.0 ± 0.2	5.0 ± 0.2	1.8 ± 0.2	1.3 ± 0.2	4.7 ± 0.2	1.5	4.7	2.1
5040 (≤10μH)	4.95 ± 0.2	4.95 ± 0.2	3.9 ± 0.2	1.3 ± 0.3	4.2 ± 0.2	1.5	4.2	2.1
5040 (>10μH)	4.95 ± 0.2	4.95 ± 0.2	3.8 ± 0.2	1.3 ± 0.3	4.2 ± 0.2	1.5	4.2	2.1
6020	6.0 ± 0.2	6.0 ± 0.2	1.8 ± 0.2	1.6 ± 0.3	5.8 ± 0.3	1.8	5.8	2.5
6028	6.0 ± 0.2	6.0 ± 0.2	2.6 ± 0.2	1.6 ± 0.3	5.8 ± 0.3	1.8	5.8	2.5
6045	6.0 ± 0.3	6.0 ± 0.3	4.2 ±0.3	1.9 ± 0.3	4.8 ± 0.3	2.15	6.5	2.2
8040 (< 1.0 μH)	8.0 ± 0.3	8.0 ± 0.3	4.2 Max	2.4 ± 0.3	6.3 ± 0.3	2.85	6.6	2.8
8040 (≥ 1.0 μH)	8.0 ± 0.3	8.0 ± 0.3	3.7 ± 0.3	2.4 ± 0.3	6.3 ± 0.3	2.85	6.6	2.8

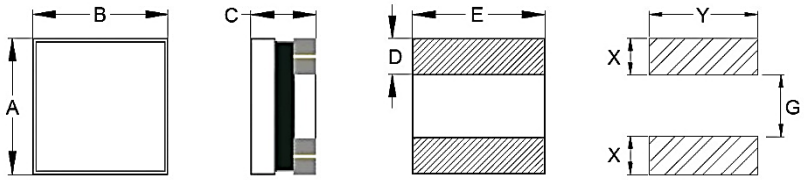
Notes: 1. The above PCB layout reference only. 2. Recommend solder paste thickness at 0.15mm and above.



(Unit: mm)

Size Code	A	B	C	D	E	X	Y	G
3010	3.0 ± 0.2	3.0 ± 0.2	1.0 max	1.0 ref	3.0 ± 0.2	1.25	3.5	0.9
3012	3.0 ± 0.2	3.0 ± 0.2	1.2 max	1.0 ref	3.0 ± 0.2	1.25	3.5	0.9
3015	3.0 ± 0.2	3.0 ± 0.2	1.5 max	1.0 ref	3.0 ± 0.2	1.25	3.5	0.9
4010	4.0 ± 0.2	4.0 ± 0.2	1.0 max	1.2 ref	4.0 ± 0.2	1.5	4.5	1.5
4012	4.0 ± 0.2	4.0 ± 0.2	1.2 max	1.2 ref	4.0 ± 0.2	1.5	4.5	1.5
4015	4.0± 0.2	4.0 ± 0.2	1.5 max	1.2 ref	4.0 ± 0.2	1.5	4.5	1.5

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

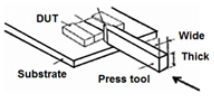
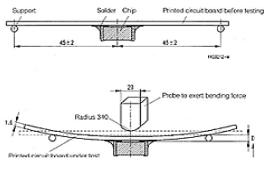


(Unit: mm)

Size Code	A	B	C	D	E	X	Y	G
1608B	1.60 ± 0.15	0.90 ± 0.15	0.95 Max.	0.50 ref.	0.90 ± 0.15	0.75	1.15	0.6
2016B	2.0 -0.1/+0.2	1.6 -0.1/+0.2	1.0 max	0.60	1.6	1.0	2.1	0.5
2520A	2.50 -0.1/+0.3	2.0 -0.05/+0.35	0.80 max.	0.85	2.0	1.15	2.5	0.7
2520C	2.5 ± 0.2	2.0 ± 0.2	1.2Max	0.85	2.0	1.15	2.5	0.7

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

RELIABILITY TEST CONDITON AND REQUIREMENT

<table>
<tr><th>Item</th><th>Test Standards / Conditions / Equipment</th><th>Requirement</th></tr>
<tr><td>Inductance</td><td>HP4284A, CH11025, CH3302, CH1320, CH1320S, LCR Meter</td><td>Refer to specification</td></tr>
<tr><td>DC Resistance</td><td>CH16502, Agilent33420A Micro-Ohm Meter</td><td>Refer to specification</td></tr>
<tr><td>Mechanical Shock</td><td>
<table>
<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>
<tr><td>SMD</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr>
<tr><td>Lead</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr>
</table>
</td><td>Appearance: No damage
Inductance: within ±10% of initial value
Q: Shall not exceed the specification value
RDC: within ±15% of initial value and shall not exceed the specification value</td></tr>
<tr><td>Solderability</td><td>Method B1, 4 Hrs at 155°C dry heat at 255°C±5°C
Test Time: 5 +0/-0.5 seconds.
Method D category 3. (steam aging 8 hours±15min) at 260°C±5°C
Test Time: 30+0/-0.5 seconds.</td><td>More than 95% of the terminal electrode should be covered with solder.</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Solder temperature: 260±5°C for 10 seconds
Temperature ramp/immersion and emersion rate 25mm/s ±6 mm/s.
Completely cover the termination.</td><td rowspan="4">Appearance: No damage
Inductance: within ±10% of initial value
Q: Shall not exceed the specification value
RDC: within ±15% of initial value and shall not exceed the specification value</td></tr>
<tr><td>Vibration</td><td>Oscillation Frequency: 10～2K～10 Hz for 20 minutes
Equipment：Vibration checker
Total Amplitude:10g
Testing Time: 12 hours (20 minutes, 12 cycles each of 3 orientations)</td></tr>
<tr><td>Load Humidity</td><td>Humidity: 85±3% R.H. Temperature: 85°C±2°C
Duration: 1000Hrs Min at 100% rated current
Measured at Room Temperature after placing for 24±2hrs</td></tr>
<tr><td>Life Test</td><td>Temperature: 125±2°C
Duration: 1000Hrs Min. with 100% rated current
Measured at Room Temperature after placing for 24±2Hrs</td></tr>
<tr><td>Thermal Shock</td><td>Condition for 1 cycle
<table>
<tr><td>Step</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>Temperature</td><td>-40 ±2ºC</td><td>125 ±2ºC</td><td>125 ±2ºC</td></tr>
<tr><td>Duration</td><td>30±5min</td><td>≤0.5min</td><td>30±5min</td></tr>
</table>
Number of cycles：300
Measured at room temperature after placing for 24±2 hrs.</td><td>Appearance: No damage
Inductance: within ±10% of initial value
Q: Shall not exceed the specification value
RDC: within ±15% of initial value and shall not exceed the specification value</td></tr>
<tr><td>Terminal Strength</td><td>Component mounted on a PCB apply a force 1.8kg 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 shock the component being tested.
 
</td><td>Appearance：No damage</td></tr>
<tr><td>Board Flex</td><td>Place the 100x40mm board into a fixture with the component facing down.
Apply a force which will bend the board:
>=0805in(2012mm):1.2mm
<0805in(2012mm):0.8mm.
Duration: 10 seconds. The Force is to be applied only once to the board
  </td><td>Appearance：No damage</td></tr>
<tr><td>Moisture Resistance</td><td>1. Baked at50°C for 25hrs, measured at room temperature after placing for 4hrs.
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.</td><td>Appearance: No damage
Inductance: within ±10% of initial value
Q: Shall not exceed the specification value
RDC: within ±15% of initial value and shall not exceed the specification value</td></tr>
</table>

SMD Power Inductor
Low Profile, High Current Type

PIW-804065

MERITEK

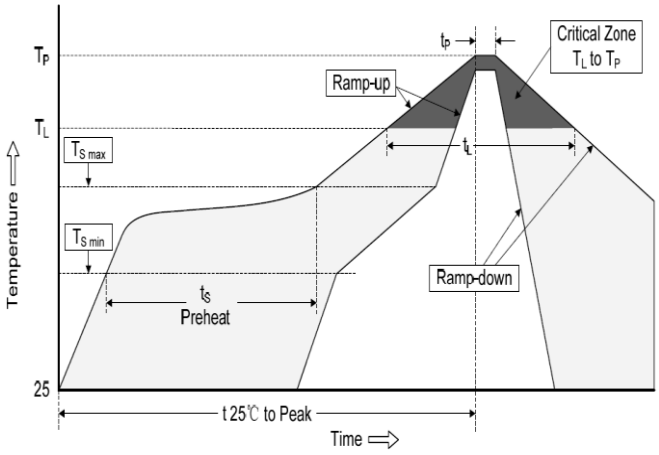
PART NUMBERING SYSTEM

PIW **681M** **8040** **65**
(1) (2) (3) (4)

No	Item	Code	Description	
(1)	**Product Code**	PIW	Power Inductor series, Wire Wound type	
(2)	**Inductance**	681M	680 µH ±20%(M)	First two digits: significant, Third: multiplier
(3)	**Size Code**	8040	8.0x8.0x4.0mm	Length x Width x Thickness (mm)
(4)	**Series Code**	65	Surface Mount Shielded, Low Profile, High Current series	

RECOMMENDED SOLDERING PROFILES

Reflow Condition		
Pre Heat	**Temp. Min $T_{s(min)}$**	150°C
	Temp. Max $T_{s(max)}$	200°C
	Time (min. to max.) (t_s)	60 ~120 seconds
Average ramp up rate (Liquidus Temperature) (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L (Ramp-up rate)		3°C/second max
Reflow	**Temp. (T_L)**	217°C
	Time (min. to max.) (t_L)	60 ~150 seconds
Peak Temperature (T_P)		See table below
Time within 5°C of actual peak Temperature (t_p)		10 seconds max
Ramp-down Rate		6°C/second max
Reflow Times		3 times max



Peak Temperature (T_P)			
Volume	**< 350mm³**	**350-2000mm³**	**> 2000mm³**
Thickness < 1.6mm	260°C	260°C	260°C
Thickness 1.6-2.5mm	260°C	250°C	245°C
Thickness ≥ 2.5mm	250°C	245°C	245°C

*Specifications subject to change without notice