SMD Power Inductor
Low Profile, High Current Type

PIW-30A63

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 Freq. (Hz)	DCR Typ. (Ω)	DCR Max. (Ω)	I_{SAT} (A)	I_{RMS} (A)
PIWR24MF30A63	0.24	±20%	1V/100K	0.035	0.042	8.0	5.00
PIWR33MF30A63	0.33	±20%	1V/100K	0.050	0.060	7.5	4.30
PIWR47MF30A63	0.47	±20%	1V/100K	0.055	0.066	6.5	3.90
PIWR68MF30A63	0.68	±20%	1V/100K	0.080	0.096	5.5	3.30
PIW1R0MF30A63	1.00	±20%	1V/100K	0.095	0.114	4.8	3.10
PIW1R5MF30A63	1.50	±20%	1V/100K	0.115	0.138	4.0	2.90
PIW2R2MF30A63	2.20	±20%	1V/100K	0.180	0.216	3.5	2.30
PIW3R3MF30A63	3.30	±20%	1V/100K	0.280	0.336	3.0	1.80
PIW4R7MF30A63	4.70	±20%	1V/100K	0.340	0.408	2.5	1.55
PIW6R8MF30A63	6.80	±20%	1V/100K	0.380	0.456	1.6	1.45
PIW100MF30A63	10.0	±20%	1V/100K	0.750	0.900	1.5	1.15
PIWR24MR30A63	0.24	±20%	1V/100K	0.040	0.048	8.0	4.50
PIWR33MR30A63	0.33	±20%	1V/100K	0.050	0.060	7.0	4.00
PIWR47MR30A63	0.47	±20%	1V/100K	0.075	0.090	6.0	3.40
PIWR68MR30A63	0.68	±20%	1V/100K	0.090	0.108	5.5	3.10
PIW1R0MR30A63	1.00	±20%	1V/100K	0.100	0.120	5.0	2.80
PIW1R5MR30A63	1.50	±20%	1V/100K	0.120	0.144	4.5	2.60
PIW2R2MR30A63	2.20	±20%	1V/100K	0.210	0.252	4.0	1.95
PIW3R3MR30A63	3.30	±20%	1V/100K	0.320	0.384	3.0	1.60
PIW4R7MR30A63	4.70	±20%	1V/100K	0.430	0.516	2.5	1.40
PIW6R8MR30A63	6.80	±20%	1V/100K	0.400	0.460	1.6	1.30
PIW100MR30A63	10.0	±20%	1V/100K	0.860	0.980	1.5	1.00

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. Heat Rated Current (Irms) measurement board: Board dimension: 100x50x1.6tmm, Pattern dimension:45x30mm, Pattern thickness: 50μm
5. Operating Temperature: -40ºC ~ +125ºC (Including Self-temperature rise)

DIMENSIONS

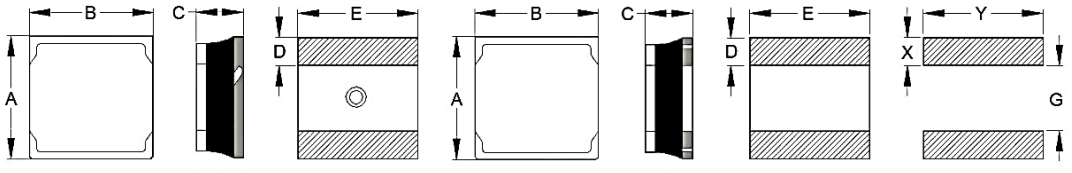


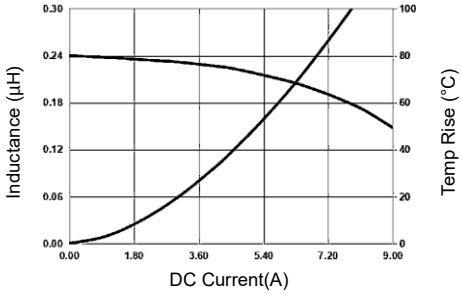
Fig.3 Fig.4

(Unit: mm)

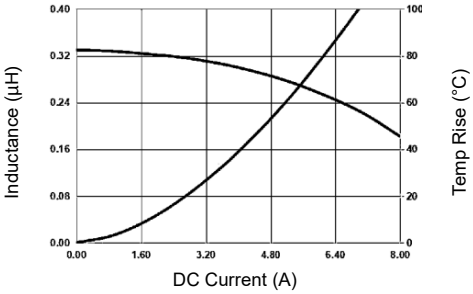
Series	A	B	C Max	D ref.	E	X	Y	G	Fig
PIW-F30A63	3.0 ±0.2	3.0 ±0.2	0.8	1.0	3.0	1.25	3.5	0.9	3
PIW-R30A63	3.0 ±0.2	3.0 ±0.2	0.8	1.0	3.0	1.25	3.5	0.9	4

CHARACTERISTIC CURVES- PIW-F30A63 series

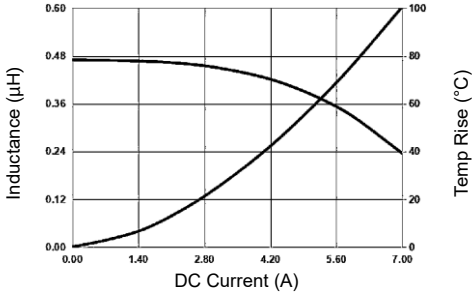
R24



R33



R47



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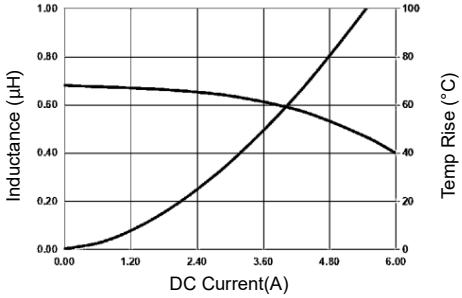
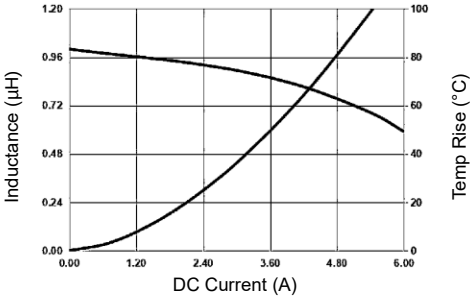


1R0



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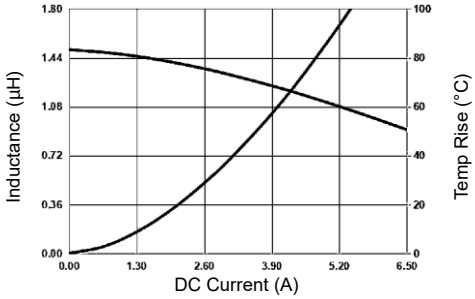
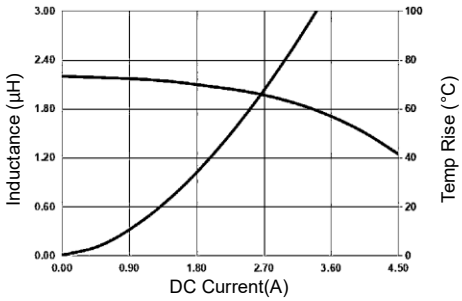
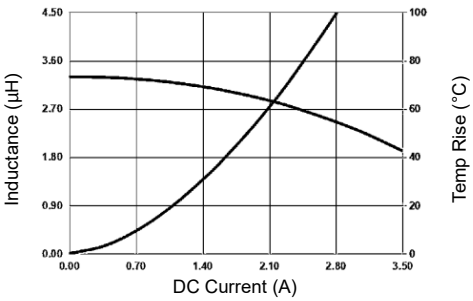


2R2



3R3



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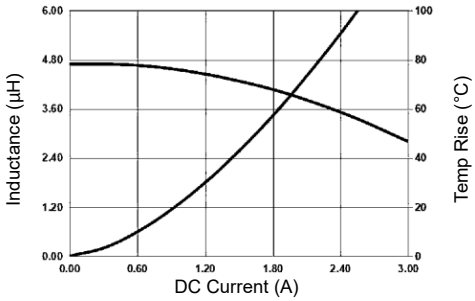
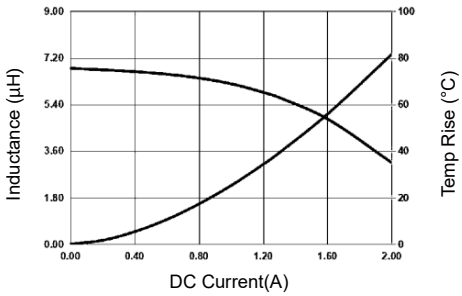


6R8



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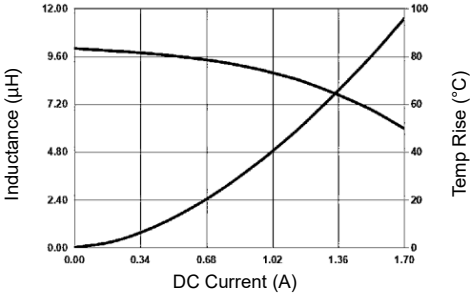
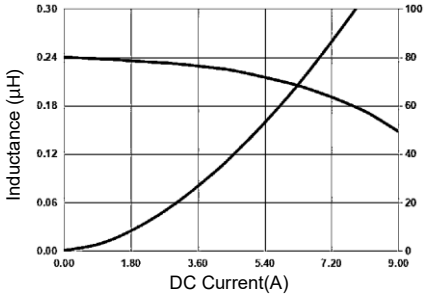


CHARACTERISTIC CURVES- PIW-R30A63 series

R24



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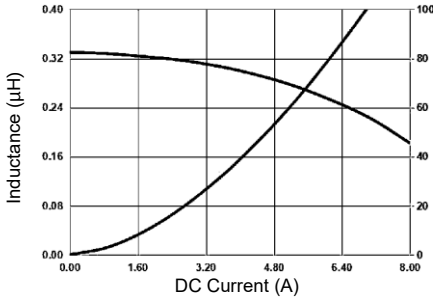

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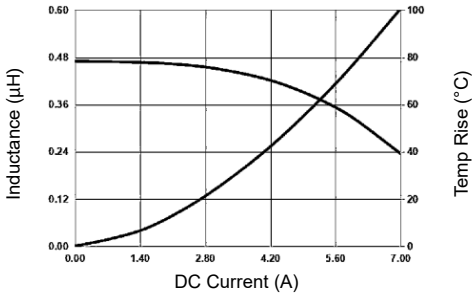

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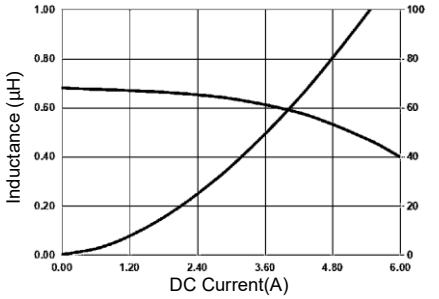

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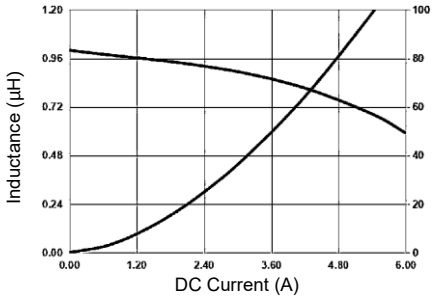

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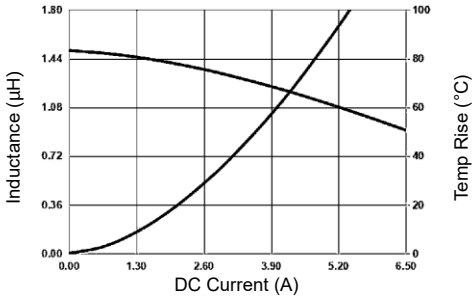

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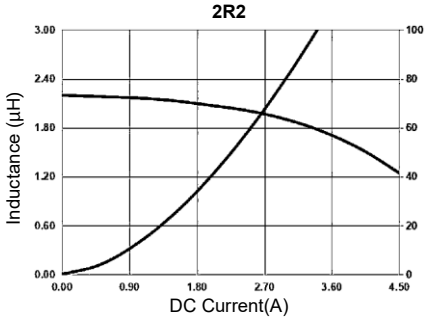

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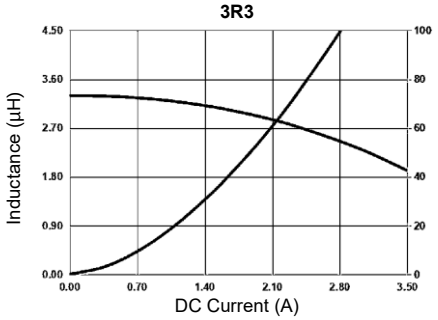

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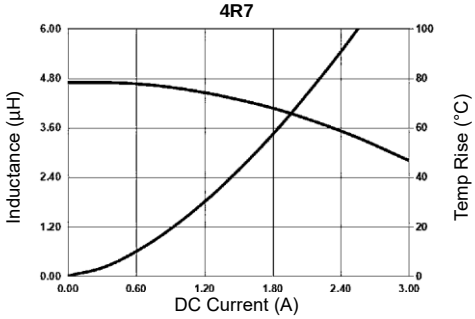

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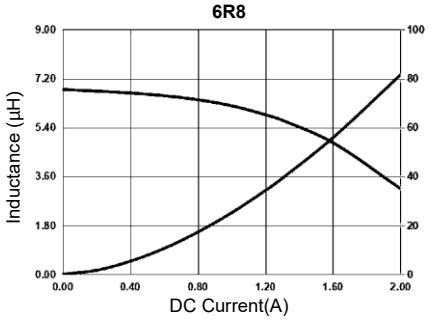

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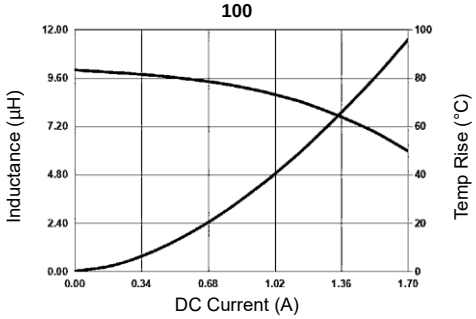
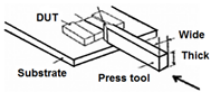
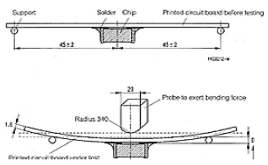


RELIABILITY TEST CONDITON AND REQUIREMENT

<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>
3 shocks in each direction along 3 perpendicular axes (18 shocks).</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.
Number of cycles: 1 heat cycle</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 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 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：500
Measured at room temperature after 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 to the side of a device being tested.
>0805inch(2012mm): 1Kg,
<=0805inch(2012mm): 0.5Kg
Duration 60 +1 seconds. 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 FR4 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 at 50°C for 25hrs, measure at room after 4hrs.
2. Raise temperature to 65±2°C 90-100%RH in 2.5hrs,
3. Keep at 65°C for 3 hours, cool down to 25°C in 2.5hrs.
4. Raise temperature to 65±2°C 90-100%RH in 2.5hrs
5. Keep at 65°C for 3hrs, cool down to 25°C in 2.5hrs
6. Keep at 25°C for 2hrs then keep at -10°C for 3hrs
7. Keep at 25°C 80-100%RH for 15min,Vibrate at the frequency of 10 to 55 Hz to 10 Hz, Measure at room temperature after 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>

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Low Profile, High Current Type

PIW-30A63

MERITEK

DIMENSIONS

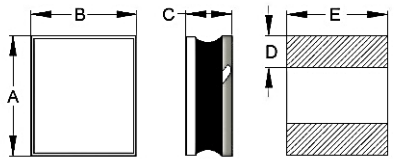


Fig.1

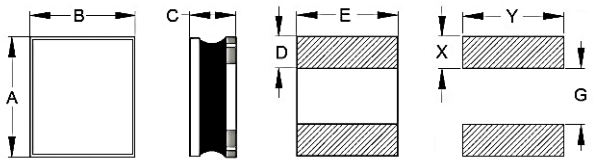


Fig.2

(Unit: mm)

Series	A	B	C Max	D ref.	E	X	Y	G	Fig
PIW03-FA63	1.6 ±0.2	0.8 ±0.2	0.8	0.5	0.8	0.75	1.15	0.6	1
PIW03-RA63	1.6 ±0.2	0.8 ±0.2	0.8	0.5	0.8	0.75	1.15	0.6	2
PIW04-FA63	1.2 ±0.2	1.0 ±0.2	0.8	0.4	1.0	0.45	1.2	0.5	1
PIW04-RA63	1.2 ±0.2	1.0 ±0.2	0.8	0.4	1.0	0.45	1.2	0.5	2
PIW05-FA63	2.0 ±0.2	1.2 ±0.2	0.8	0.5	1.2	0.75	1.4	0.8	1
PIW05-RA63	2.0 ±0.2	1.2 ±0.2	0.8	0.5	1.2	0.75	1.4	0.8	2
PIW05-FB63	2.0 ±0.2	1.2 ±0.2	1.0	0.5	1.2	0.75	1.4	0.8	1
PIW05-RB63	2.0 ±0.2	1.2 ±0.2	1.0	0.5	1.2	0.75	1.4	0.8	2
PIW06-FA63	1.9~2.2	1.5~1.8	0.8	0.5	1.6	0.75	1.9	0.8	1
PIW06-RA63	1.9~2.2	1.5~1.8	0.8	0.5	1.6	0.75	1.9	0.8	2
PIW06-FB63	1.9~2.2	1.5~1.8	1.0	0.5	1.6	0.75	1.9	0.8	1
PIW06-HB63	1.9~2.2	1.5~1.8	1.0	0.5	1.6	0.75	1.9	0.8	1
PIW06-RB63	2.0 ±0.2	1.6 ±0.2	1.0	0.65 ±0.20	1.6	0.75	1.9	0.8	2
PIW08-FA63	2.4~2.7	1.9~2.2	0.8	0.75	2.0	0.95	2.4	1.0	1
PIW08-RA63	2.4~2.7	1.9~2.2	0.8	0.75	2.0	0.95	2.4	1.0	2
PIW08-FB63	2.4~2.7	1.9~2.2	1.0	0.75	2.0	0.95	2.4	1.0	1
PIW08-HB63	2.4~2.7	1.9~2.2	1.0	0.75	2.0	0.95	2.4	1.0	1
PIW08-RB63	2.5 ±0.2	2.0 ±0.2	1.0	0.80 ±0.20	2.0	0.95	2.4	1.0	2
PIW08-FC63	2.4~2.7	1.9~2.2	1.2	0.75	2.0	0.95	2.4	1.0	1
PIW08-HC63	2.4~2.7	1.9~2.2	1.2	0.75	2.0	0.95	2.4	1.0	1
PIW08-RC63	2.5 ±0.2	2.0 ±0.2	1.2	0.80 ±0.20	2.0	0.95	2.4	1.0	2
PIW10-FA63	3.2 ±0.2	2.5 ±0.2	0.8	0.95	2.5	1.20	2.8	1.2	1
PIW10-RA63	3.2 ±0.2	2.5 ±0.2	0.8	0.95	2.5	1.20	2.8	1.2	2
PIW10-FB63	3.2 ±0.2	2.5 ±0.2	1.0	0.95	2.5	1.20	2.8	1.2	1
PIW10-FC63	3.2 ±0.2	2.5 ±0.2	1.2	0.95	2.5	1.20	2.8	1.2	1
PIW10-RC63	3.2 ±0.2	2.5 ±0.2	1.2	0.95	2.5	1.20	2.8	1.2	2
PIW-R40A63	4.0 ±0.2	4.0 ±0.2	0.8	1.4 ±0.25	4.0	1.50	4.5	1.5	2

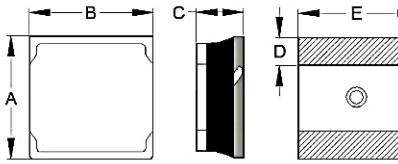


Fig.3

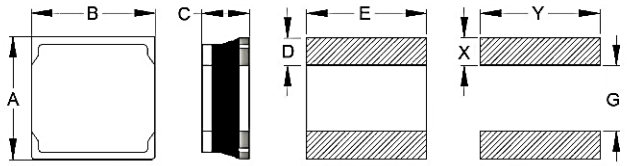


Fig.4

(Unit: mm)

Series	A	B	C Max	D ref.	E	X	Y	G	Fig
PIW-F30A63	3.0 ±0.2	3.0 ±0.2	0.8	1.0	3.0	1.25	3.5	0.9	3
PIW-R30A63	3.0 ±0.2	3.0 ±0.2	0.8	1.0	3.0	1.25	3.5	0.9	4
PIW-H30B63	3.0 ±0.2	3.0 ±0.2	1.0	1.0	3.0	1.25	3.5	0.9	3
PIW-H30C63	3.0 ±0.2	3.0 ±0.2	1.2	1.0	3.0	1.25	3.5	0.9	3
PIW-R30D63	3.0 ±0.2	3.0 ±0.2	1.5	1.0	3.0	1.25	3.5	0.9	4
PIW-H40B63	4.0 ±0.2	4.0 ±0.2	1.0	1.4 ±0.25	4.0	1.5	4.5	1.5	3
PIW-H40C63	4.0 ±0.2	4.0 ±0.2	1.2	1.4 ±0.25	4.0	1.5	4.5	1.5	3

SMD Power Inductor
Low Profile, High Current Type

PIW-30A63

MERITEK

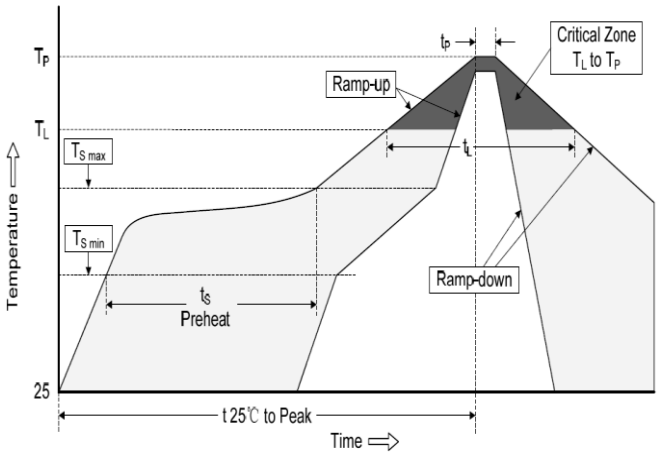
PART NUMBERING SYSTEM

PIW	100M	R	30A	63
(1)	(2)	(3)	(4)	(5)

No	Item	Code	Description	
(1)	**Product Code**	PIW	Power Inductor Series, Wire Wound Type	
(2)	**Inductance**	100M	10µH ±20% (M)	R47: 0.47µH, 2R2: 2.2µH
(3)	**Internal Code**	R	R Type	F Type, H Type
(4)	**Size Code**	30A	3.0x3.0x0.8mm	Length x Width x Height (mm)
(5)	**Series Code**	63	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