

SMD Power Inductor

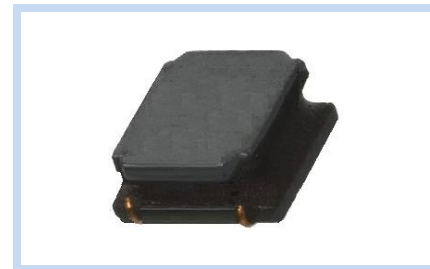
Low Profile, High Current Type

PIW-30C63

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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



ELECTRICAL CHARACTERISTICS

Part Number	Inductance (μH)	Tolerance (%)	Test Freq. (Hz)	DCR Typ. (Ω)	DCR Max. (Ω)	I _{SAT} (A)	I _{RMS} (A)
PIWR33MH30C63	0.33	±20%	1V/1M	0.020	0.024	9.0	5.5
PIWR47MH30C63	0.47	±20%	1V/1M	0.025	0.030	7.5	5.2
PIWR68MH30C63	0.68	±20%	1V/1M	0.032	0.038	6.5	4.5
PIW1R0MH30C63	1.00	±20%	1V/1M	0.042	0.049	5.2	4.0
PIW1R5MH30C63	1.50	±20%	1V/1M	0.060	0.072	4.5	3.5
PIW2R2MH30C63	2.20	±20%	1V/1M	0.090	0.108	3.6	2.8
PIW3R3MH30C63	3.30	±20%	1V/1M	0.130	0.156	3.0	2.1
PIW4R7MH30C63	4.70	±20%	1V/1M	0.180	0.216	2.6	1.8
PIW6R8MH30C63	6.80	±20%	1V/1M	0.250	0.300	2.2	1.5
PIW100MH30C63	10.0	±20%	1V/1M	0.290	0.350	1.5	1.4

Notes:

1. All test data referenced to 25°C ambient.
2. Saturation Current (I_{sat}) based on inductance drop ($\Delta L/L_0 \leq 30\%$) approximately
3. Heat Rated Current (I_{rms}) based on temperature rise ($\Delta T: 40^\circ\text{C}$) approximately
4. Heat Rated Current (I_{rms}) measurement board: Board dimension: 100x50x1.6mm, Pattern dimension: 45x30mm, Pattern thickness: 50μm
5. Operating Temperature: -40°C ~ +125°C (Including Self-temperature rise)

DIMENSIONS

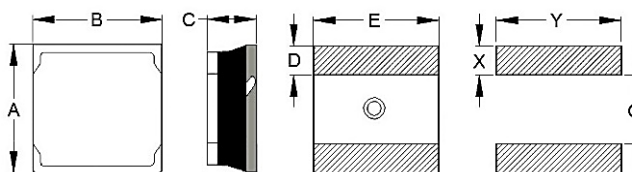


Fig.3

(Unit: mm)

Series	A	B	C Max	D ref.	E	X	Y	G	Fig
PIW-H30C63	3.0 ±0.2	3.0 ±0.2	1.2	1.0	3.0	1.25	3.5	0.9	3

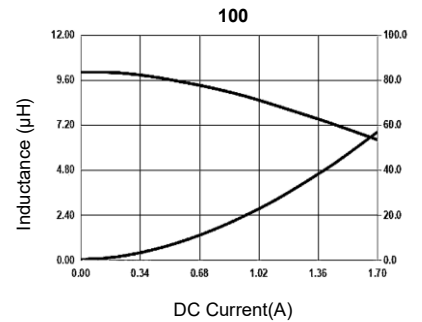
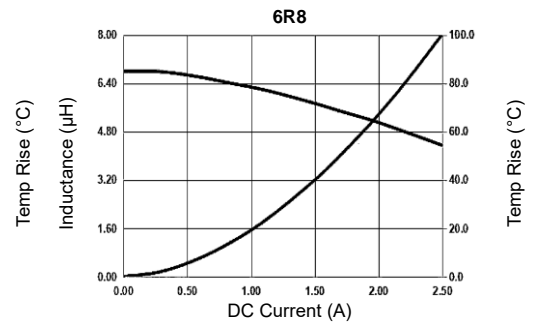
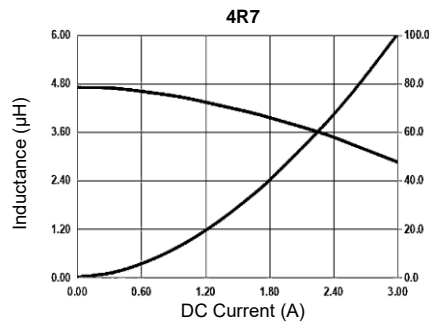
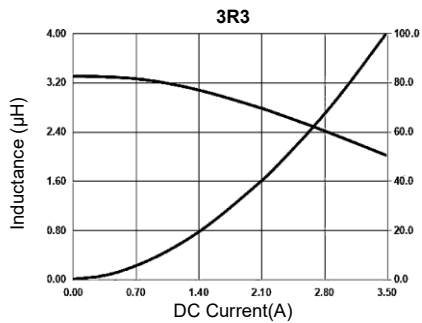
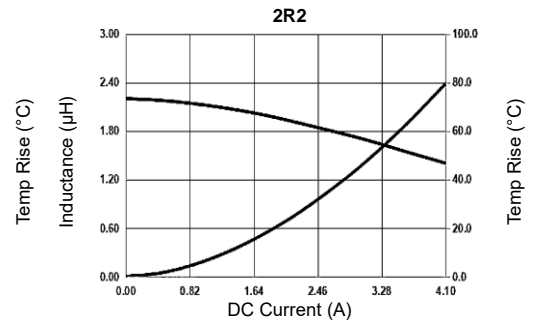
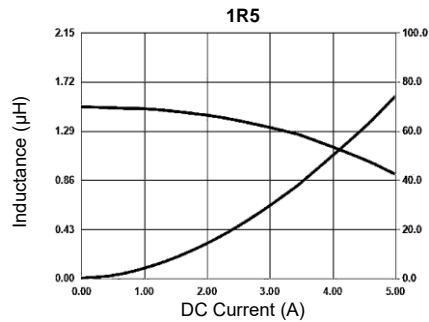
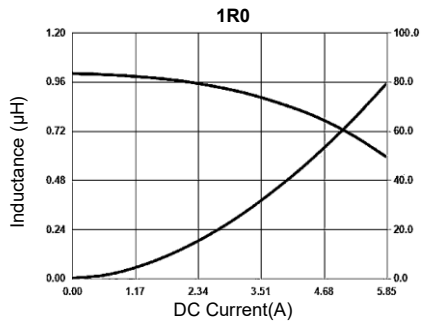
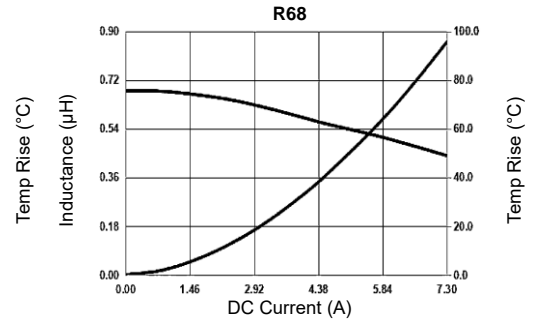
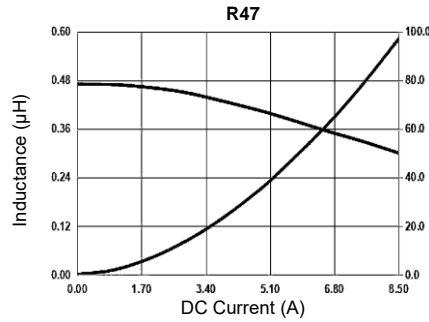
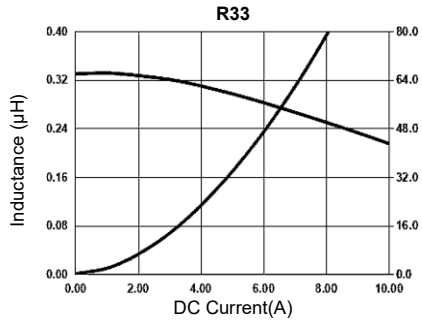
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CHARACTERISTIC CURVES- PIW-H30C63 series



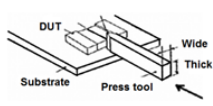
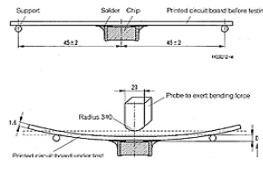
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RELIABILITY TEST CONDITON AND REQUIREMENT

Item	Test Standards / Conditions / Equipment	Requirement															
Inductance	HP4284A, CH11025, CH3302, CH1320, CH1320S, LCR Meter	Refer to specification															
DC Resistance	CH16502, Agilent33420A Micro-Ohm Meter	Refer to specification															
Mechanical Shock	<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 (V) ft/sec</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>3 shocks in each direction along 3 perpendicular axes (18 shocks).</p>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V) ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine	11.3	<p>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</p>
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V) ft/sec													
SMD	50	11	Half-sine	11.3													
Lead	50	11	Half-sine	11.3													
Solderability	<p>Method B1, 4 Hrs at 155°C dry heat at 255°C$\pm 5^\circ\text{C}$ Test Time: 5 +0/-0.5 seconds. Method D category 3. (steam aging 8 hours$\pm 15\text{min}$) at 260°C$\pm 5^\circ\text{C}$ Test Time: 30+0/-0.5 seconds.</p>	More than 95% of the terminal electrode should be covered with solder.															
Resistance to Soldering Heat	<p>Solder temperature: 260$\pm 5^\circ\text{C}$ for 10 seconds Temperature ramp/immersion and emersion rate 25mm/s ± 6 mm/s. Completely cover the termination. Number of cycles: 1 heat cycle</p>																
Vibration	<p>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)</p>	<p>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</p>															
Load Humidity	<p>Humidity: 85$\pm 3\%$ R.H. Temperature: 85°C$\pm 2^\circ\text{C}$ Duration: 1000Hrs Min at 100% rated current Measured at Room Temperature after 24± 2hrs</p>																
Life Test	<p>Temperature: 125$\pm 2^\circ\text{C}$ Duration: 1000Hrs Min. with 100% rated current Measured at Room Temperature after 24± 2Hrs</p>																
Thermal Shock	<p>Condition for 1 cycle</p> <table border="1"> <thead> <tr> <th>Step</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>-40 $\pm 2^\circ\text{C}$</td> <td>125 $\pm 2^\circ\text{C}$</td> <td>125 $\pm 2^\circ\text{C}$</td> </tr> <tr> <td>Duration</td> <td>30± 5min</td> <td>≤ 0.5min</td> <td>30± 5min</td> </tr> </tbody> </table> <p>Number of cycles : 500 Measured at room temperature after 24± 2 hrs.</p>	Step	1	2	3	Temperature	-40 $\pm 2^\circ\text{C}$	125 $\pm 2^\circ\text{C}$	125 $\pm 2^\circ\text{C}$	Duration	30 ± 5 min	≤ 0.5 min	30 ± 5 min	<p>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</p>			
Step	1	2	3														
Temperature	-40 $\pm 2^\circ\text{C}$	125 $\pm 2^\circ\text{C}$	125 $\pm 2^\circ\text{C}$														
Duration	30 ± 5 min	≤ 0.5 min	30 ± 5 min														
Terminal Strength	<p>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.</p> 	Appearance : No damage															
Board Flex	<p>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</p> 	Appearance : No damage															
Moisture Resistance	<ol style="list-style-type: none"> Baked at 50°C for 25hrs, measure at room after 4hrs. Raise temperature to 65$\pm 2^\circ\text{C}$ 90-100%RH in 2.5hrs, Keep at 65°C for 3 hours, cool down to 25°C in 2.5hrs. Raise temperature to 65$\pm 2^\circ\text{C}$ 90-100%RH in 2.5hrs Keep at 65°C for 3hrs, cool down to 25°C in 2.5hrs Keep at 25°C for 2hrs then keep at -10°C for 3hrs 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. 	<p>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</p>															

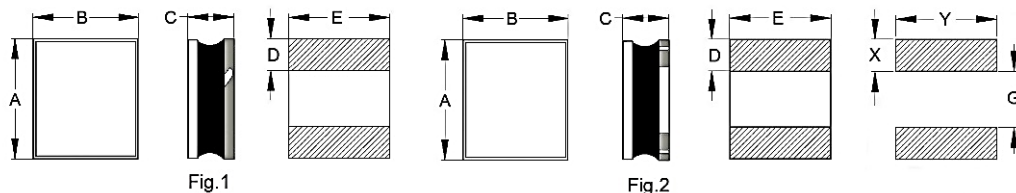
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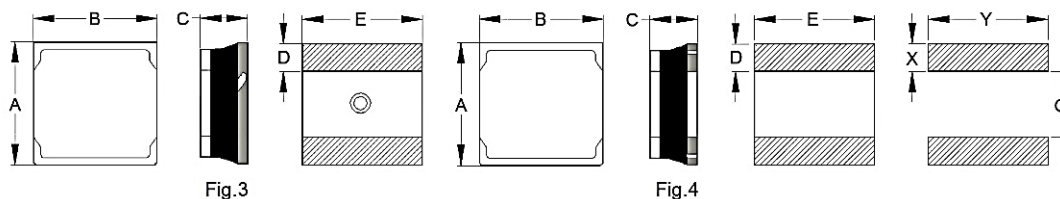
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DIMENSIONS



(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



(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

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PART NUMBERING SYSTEM

PIW 100M H 30C 63
 (1) (2) (3) (4) (5)

No	Item	Code	Description	
(1)	Product Code	PIW	Power Inductor Series, Wire Wound Type	
(2)	Inductance	100M	10 μ H \pm 20% (M)	R47: 0.47 μ H, 2R2: 2.2 μ H
(3)	Internal Code	H	H Type	F Type, R Type
(4)	Size Code	30C	3.0x3.0x1.2mm	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)		
	< 350mm ³	350-2000mm ³	> 2000mm ³
Thickness < 1.6mm	260°C	260°C	260°C
Thickness 1.6-2.5mm	260°C	250°C	245°C
Thickness \geq 2.5mm	250°C	245°C	245°C

*Specifications subject to change without notice

