

# Wire Wound SMD Power Inductors – WPN Series

Operating Temp. : -40°C~+125°C (Including self-heating)



## FEATURES

- Fe base metal material core provides large saturation current
- Metallization on ferrite core results in excellent shock resistance and damage-free durability
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- Low DCR decreases power loss, small and slim take up less PCB real estate
- Automatic production ensures high quality and consistency

## APPLICATIONS

- Smart phone
- Blue-ray disc recorders, set top box
- Notebooks, desktop computers, servers
- Portable gaming devices, personal navigation systems, personal multimedia devices

## PRODUCT IDENTIFICATION

**WPN**

①

**252012**

②

**H**

③

**2R2**

④

**M**

⑤

**T**

⑥

□□□

⑦

① Type	
WPN	Wire Wound SMD Power Inductor

③ Feature Type	
H	H Type
M	M Type
U	U Type
E	E Type

④ Nominal Inductance	
Example	Nominal Value
R47	0.47μH
2R2	2.2μH

⑤ Inductance Tolerance	
N	±30%
M	±20%

② (L×W×H) [mm]	
External Dimensions (L×W×H) [mm]	
201610	2.0×1.6×1.0
201612	2.0×1.6×1.2
252010	2.5×2.0×1.0
252012	2.5×2.0×1.2
3012	3.0×3.0×1.2
4012	4.0×4.0×1.2
4020	4.0×4.0×2.0

⑥ Packing	
T	Tape & Reel

⑦ Design Code	
□□□	Design Code
* Standard product is blank	

# SHAPE AND DIMENSIONS

Fig.1

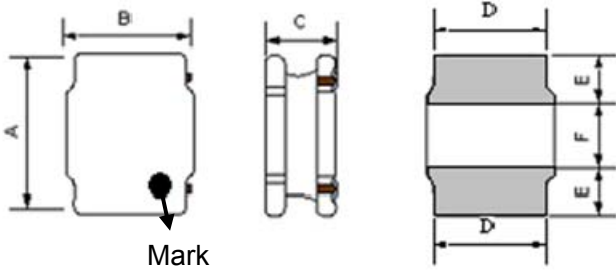


Fig.2

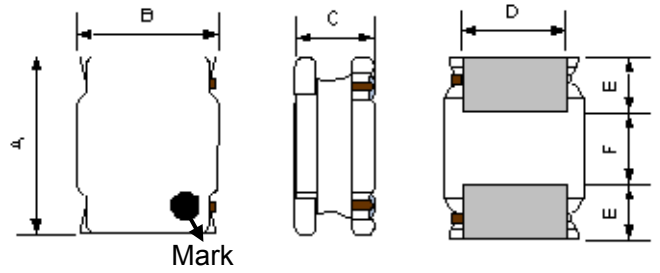


Fig.3

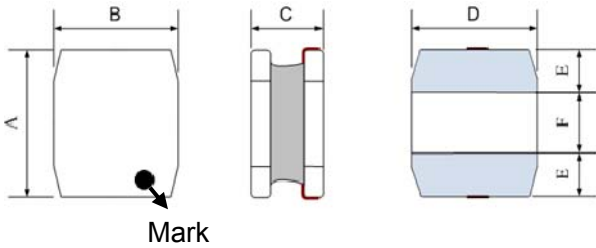


Fig.4

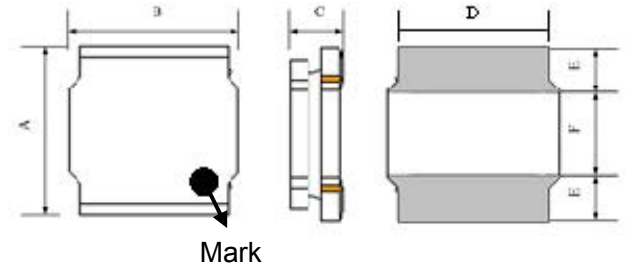
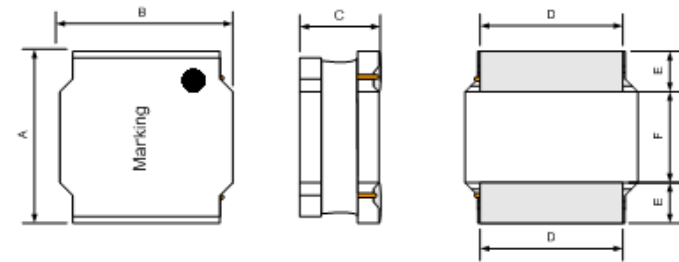
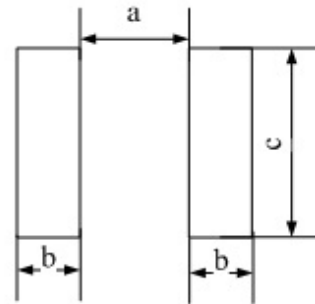


Fig.5



Recommended Land Pattern



Unit: mm

Series	Shape	A	B	C	D	E	F	a Typ.	b Typ.	c Typ.
WPN201610H	Fig.1	2.0±0.2	1.6±0.2	1.0 Max.	1.5±0.2	0.6±0.2	0.8±0.2	0.7	0.7	1.7
WPN201610M	Fig.2	2.0±0.2	1.6±0.2	1.0 Max.	1.2±0.2	0.6±0.2	0.8±0.2	0.7	0.7	1.7
WPN201610U	Fig.3	2.0±0.2	1.6±0.2	1.0 Max.	1.6±0.2	0.6±0.2	0.8±0.2	0.7	0.7	1.7
WPN201612	Fig.1	2.0±0.2	1.6±0.2	1.2 Max.	1.2±0.2	0.6±0.2	0.8±0.2	0.7	0.7	1.7
WPN252010	Fig.1	2.5±0.2	2.0±0.2	1.0 Max.	1.65±0.2	0.8±0.2	0.8±0.2	0.8	0.85	2.0
WPN252012H	Fig.1	2.5±0.2	2.0±0.2	1.2 Max.	1.65±0.2	0.8±0.2	0.8±0.2	0.8	0.85	2.0
WPN252012E	Fig.1	2.5±0.2	2.0±0.2	1.2 Max.	1.65±0.2	0.8±0.2	0.8±0.2	0.8	0.85	2.0
WPN3012	Fig.4	3.0±0.2	3.0±0.2	1.2 Max.	2.6±0.2	0.75±0.2	1.5±0.2	1.5	0.8	3.2
WPN4012	Fig.5	4.0±0.2	4.0±0.2	1.2 Max.	3.1±0.2	0.95±0.2	2.1±0.2	1.9	1.1	3.7
WPN4020	Fig.5	4.0±0.2	4.0±0.2	2.0 Max.	3.1±0.2	0.95±0.2	2.1±0.2	1.9	1.1	3.7

## SPECIFICATIONS

### WPN201610H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN201610HR24MT	0.24±20%	0.040	0.033	145	4.50	5.50	3.00	3.45
WPN201610HR47MT	0.47±20%	0.049	0.041	102	4.00	4.70	2.70	3.10
WPN201610HR68MT	0.68±20%	0.065	0.057	77	3.50	4.00	2.50	2.80
WPN201610H1R0MT	1.0±20%	0.090	0.075	70	3.35	3.85	2.05	2.35
WPN201610H1R0MTY01	1.0±20%	0.070	0.060	65	2.60	3.05	2.20	2.55
WPN201610H1R5MT	1.5±20%	0.130	0.110	45	1.95	2.30	1.70	2.00
WPN201610H2R2MT	2.2±20%	0.170	0.142	39	1.90	2.15	1.45	1.70
WPN201610H4R7MT	4.7±20%	0.425	0.370	25	1.20	1.50	0.90	1.00
WPN201610H100MT	10±20%	0.826	0.688	15	0.80	0.95	0.65	0.75

### WPN201610M Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN201610MR24MT	0.24±20%	0.026	0.022	160	5.90	6.80	4.35	4.80
WPN201610MR33MT	0.33±20%	0.038	0.032	120	5.50	6.00	3.40	3.80
WPN201610MR47MT	0.47±20%	0.044	0.037	107	4.30	5.20	3.00	3.30
WPN201610MR68MT	0.68±20%	0.060	0.050	92	3.60	4.20	2.60	3.00
WPN201610M1R0MT	1.0±20%	0.090	0.075	52	3.35	3.85	2.05	2.35
WPN201610M2R2MT	2.2±20%	0.160	0.135	41	1.80	2.00	1.60	1.75

### WPN201610U Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN201610UR12MT	0.12±20%	0.015	0.012	250	9.50	11.00	5.60	6.50
WPN201610UR33MT	0.33±20%	0.025	0.022	121	5.50	6.00	4.10	4.70
WPN201610UR47MT	0.47±20%	0.033	0.028	110	4.50	5.00	3.60	4.10
WPN201610UR68MT	0.68±20%	0.045	0.037	78	3.20	3.70	3.10	3.60
WPN201610U1R0MT	1.0±20%	0.060	0.050	63	3.00	3.50	2.60	3.00
WPN201610U1R5MT	1.5±20%	0.110	0.095	50	2.80	3.20	2.00	2.30
WPN201610U2R2MT	2.2±20%	0.120	0.100	44	1.80	2.10	1.90	2.20
WPN201610U4R7MT	4.7±20%	0.288	0.240	21	1.30	1.50	1.25	1.45

### WPN201612H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN201612HR24MT	0.24±20%	0.023	0.019	116	5.85	6.75	4.50	5.20
WPN201612HR33MT	0.33±20%	0.031	0.026	95	5.15	6.00	3.85	4.45
WPN201612HR47MT	0.47±20%	0.041	0.034	84	3.95	4.60	3.40	3.90
WPN201612H1R0MT	1.0±20%	0.059	0.049	60	2.70	3.10	2.70	3.00
WPN201612H1R5MT	1.5±20%	0.109	0.091	42	1.90	2.35	2.10	2.45



The Specifications subject to change without notice. Please check our website for latest information. Revised 2016/07/21

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## SPECIFICATIONS

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN201612H2R2MT	2.2±20%	0.146	0.122	32	1.70	2.00	1.80	2.05

### WPN252010H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN252010HR33MT	0.33±20%	0.039	0.033	117	4.80	5.50	3.50	4.05
WPN252010HR47MT	0.47±20%	0.045	0.038	80	4.40	5.20	3.20	3.70
WPN252010HR68MT	0.68±20%	0.059	0.049	65	3.20	3.60	2.75	3.20
WPN252010H1R0MT	1.0±20%	0.076	0.063	46	3.10	3.50	2.50	2.90
WPN252010H1R5MT	1.5±20%	0.106	0.088	40	2.60	3.00	2.00	2.30
WPN252010H2R2MT	2.2±20%	0.155	0.129	26	1.90	2.20	1.50	1.80
WPN252010H3R3MT	3.3±20%	0.235	0.196	24	1.60	1.80	1.20	1.40
WPN252010H4R7MT	4.7±20%	0.276	0.230	19	1.30	1.50	1.10	1.30
WPN252010H100MT	10±20%	0.500	0.435	12	0.90	1.00	0.80	0.90

### WPN252012H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN252012HR24MT	0.24±20%	0.023	0.019	117	6.50	7.80	4.05	4.70
WPN252012HR33MT	0.33±20%	0.028	0.023	104	5.30	6.20	3.70	4.30
WPN252012HR47MT	0.47±20%	0.035	0.029	89	4.90	5.60	3.45	4.00
WPN252012HR68MT	0.68±20%	0.043	0.036	67	3.70	4.30	3.15	3.60
WPN252012H1R0MT	1.0±20%	0.054	0.048	52	3.60	4.20	3.00	3.40
WPN252012H1R5MT	1.5±20%	0.072	0.060	38	2.90	3.50	2.40	2.80
WPN252012H2R2MT	2.2±20%	0.120	0.100	32	2.60	3.00	1.90	2.15
WPN252012H2R2MTY01	2.2±20%	0.102	0.085	36	2.30	2.70	2.10	2.40
WPN252012H3R3MT	3.3±20%	0.163	0.136	25	1.70	2.10	1.80	2.05
WPN252012H4R7MT	4.7±20%	0.260	0.225	23	1.60	1.90	1.25	1.45
WPN252012H6R8MT	6.8±20%	0.366	0.305	16	1.15	1.35	0.95	1.10
WPN252012H100MT	10±20%	0.480	0.435	14	1.10	1.35	0.85	1.00

### WPN252012E Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN252012E1R0MT	1.0±20%	0.044	0.037	52	4.50	5.00	3.50	3.90
WPN252012ER47MT	0.47±20%	0.032	0.026	92	7.00	8.00	4.10	4.70
WPN252012E1R0MT	1.0±20%	0.044	0.037	52	4.50	5.00	3.50	3.90

## SPECIFICATIONS

### WPN3012H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN3012HR33MT	0.33±20%	0.027	0.023	107	7.20	8.90	4.20	4.85
WPN3012HR47MT	0.47±20%	0.033	0.028	86	6.80	8.00	3.90	4.50
WPN3012HR68MT	0.68±20%	0.042	0.035	63	5.80	6.80	3.40	3.90
WPN3012H1R0MT	1.0±20%	0.054	0.045	51	4.20	5.40	2.70	3.10

### WPN3012H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN3012H1R5MT	1.5±20%	0.074	0.064	37	3.40	4.10	2.50	2.90
WPN3012H2R2MT	2.2±20%	0.108	0.090	28	2.80	3.35	2.05	2.35
WPN3012H3R3MT	3.3±20%	0.155	0.129	25	2.20	2.60	1.70	2.00
WPN3012H4R7MT	4.7±20%	0.235	0.196	20	2.00	2.50	1.30	1.50
WPN3012H6R8MT	6.8±20%	0.340	0.290	16	1.60	1.90	1.10	1.25
WPN3012H100MT	10±20%	0.474	0.395	12	1.20	1.45	1.00	1.15

### WPN4012H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN4012HR33MT	0.33±20%	0.032	0.027	113	10.30	11.50	4.30	4.90
WPN4012HR47MT	0.47±20%	0.041	0.034	96	9.10	9.90	3.80	4.40
WPN4012HR68MT	0.68±20%	0.041	0.034	70	5.50	6.35	3.80	4.40
WPN4012H1R0MT	1.0±20%	0.059	0.049	55	5.70	6.60	3.20	3.70
WPN4012H1R0MTY01	1.0±20%	0.049	0.041	56	4.50	5.30	3.60	4.20
WPN4012H1R2MT	1.2±20%	0.059	0.049	48	4.00	4.80	3.20	3.70
WPN4012H1R5MT	1.5±20%	0.070	0.058	38	3.90	4.60	2.90	3.30
WPN4012H2R2MT	2.2±20%	0.079	0.066	28	2.80	3.30	2.70	3.10
WPN4012H3R3MT	3.3±20%	0.125	0.104	23	2.80	3.30	2.10	2.50
WPN4012H4R7MT	4.7±20%	0.166	0.138	19	2.30	2.60	1.90	2.20
WPN4012H6R8MT	6.8±20%	0.226	0.188	17	1.60	2.20	1.60	1.85
WPN4012H100MT	10±20%	0.335	0.279	12	1.55	1.85	1.30	1.50
WPN4012H220MT	22±20%	0.679	0.566	7	1.05	1.30	0.90	1.05

### WPN4020H Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
WPN4020HR22MT	0.22±20%	0.013	0.011	108	18.70	22.00	8.20	9.50
WPN4020HR47MT	0.47±20%	0.022	0.018	72	13.40	15.50	6.40	7.40
WPN4020HR68MT	0.68±20%	0.022	0.018	57	8.70	11.10	6.40	7.40
WPN4020H1R0MT	1.0±20%	0.026	0.022	37	8.70	11.10	5.80	6.70
WPN4020H1R5MT	1.5±20%	0.036	0.030	30	7.70	9.60	5.20	6.00



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## SPECIFICATIONS

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current		Heat Rating Current	
	@1MHz	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	$\mu\text{H}$	$\Omega$		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		I <sub>rms</sub>	
WPN4020H2R2MT	2.2±20%	0.048	0.040	25	6.10	7.60	4.30	5.00
WPN4020H3R3MT	3.3±20%	0.072	0.060	19	4.70	5.90	3.45	4.00
WPN4020H4R7MT	4.7±20%	0.108	0.090	17	4.00	4.90	2.85	3.30
WPN4020H6R8MT	6.8±20%	0.156	0.130	13	3.00	4.20	2.40	2.80
WPN4020H100MT	10±20%	0.216	0.180	11	2.80	3.50	2.00	2.35

※1: All test data is referenced to 20°C ambient;

※2: Rated current: Isat or I<sub>rms</sub>, whichever is smaller;

※3: For WPN2016 & WPN2520 size inductors, absolute maximum voltage: DC 25V; For WPN30 & WPN40 size inductors, absolute maximum voltage: DC 40V;

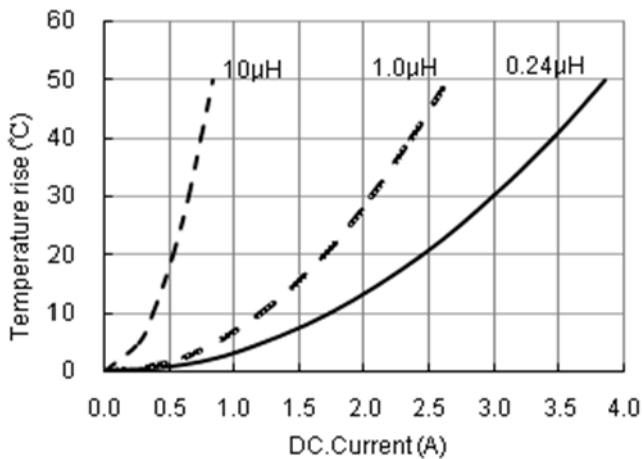
※Isat: DC current at which the inductance drops approximate 30% from its value without current;

※I<sub>rms</sub>: DC current that causes the temperature rise ( $\Delta T = 40^\circ\text{C}$ ) from 20°C ambient.

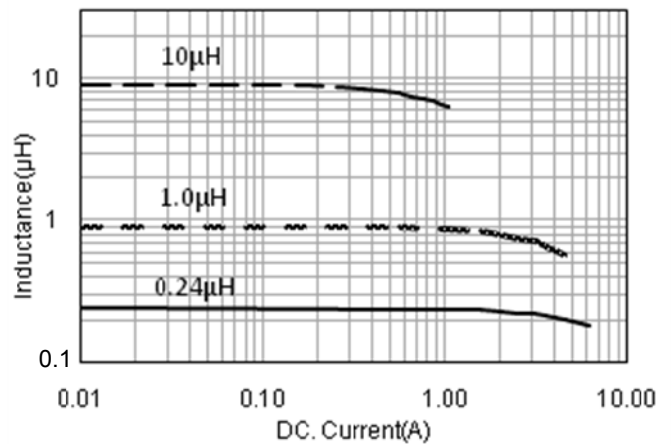
## TYPICAL ELECTRICAL CHARACTERISTICS

### WPN201610H Series

Temperature vs. DC Current Characteristics

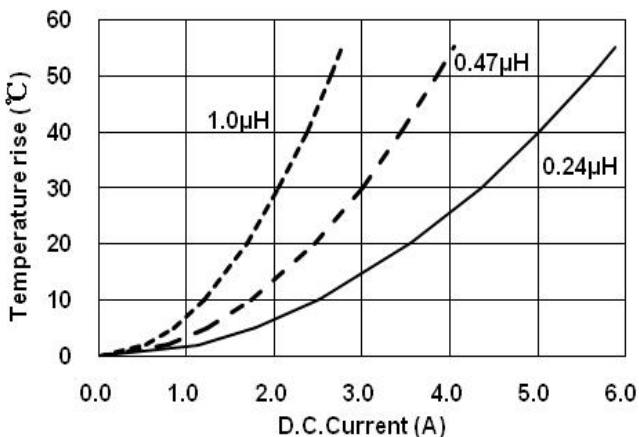


Inductance vs. DC Current Characteristics

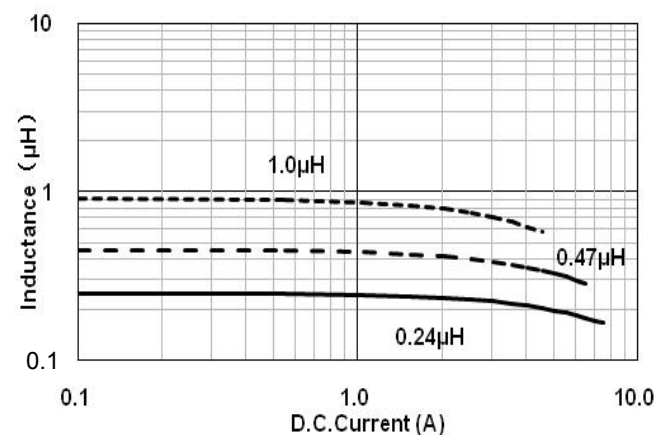


### WPN201610M Series

Temperature vs. DC Current Characteristics



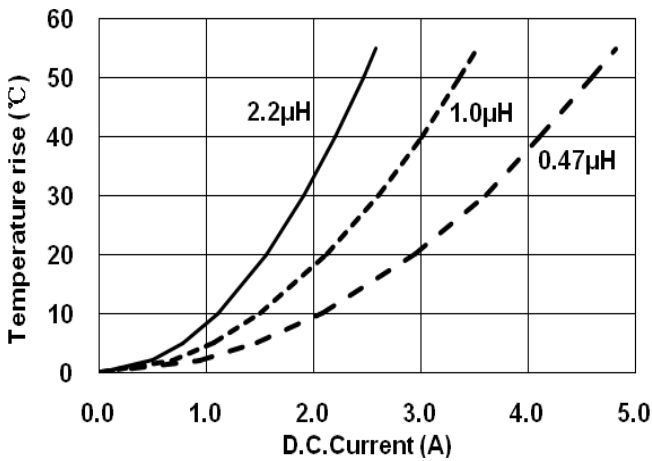
Inductance vs. DC Current Characteristics



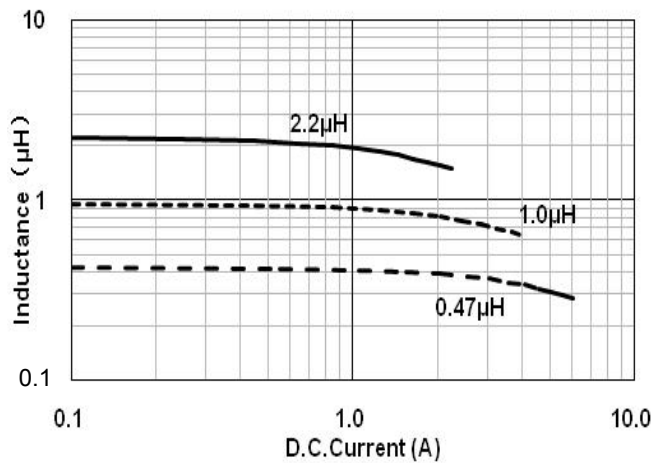
# TYPICAL ELECTRICAL CHARACTERISTICS

## WPN201610U Series

Temperature vs. DC Current Characteristics

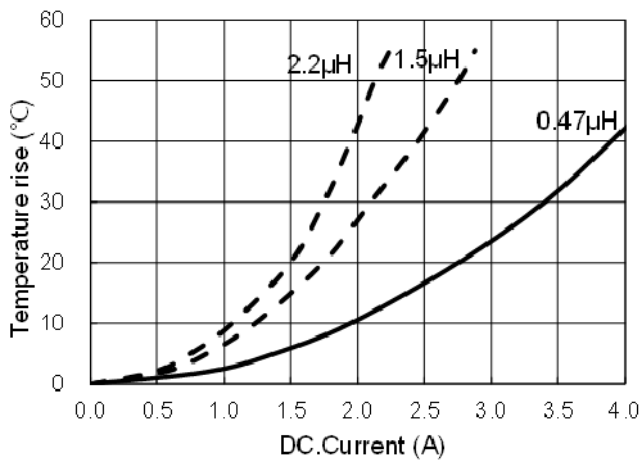


Inductance vs. DC Current Characteristics

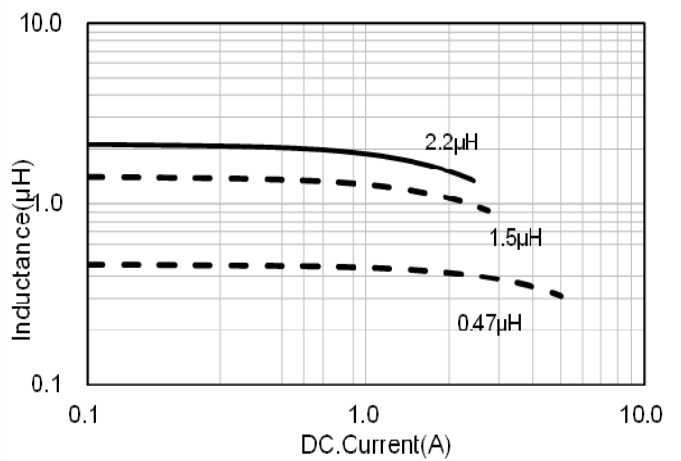


## WPN201612H Series

Temperature vs. DC Current Characteristics

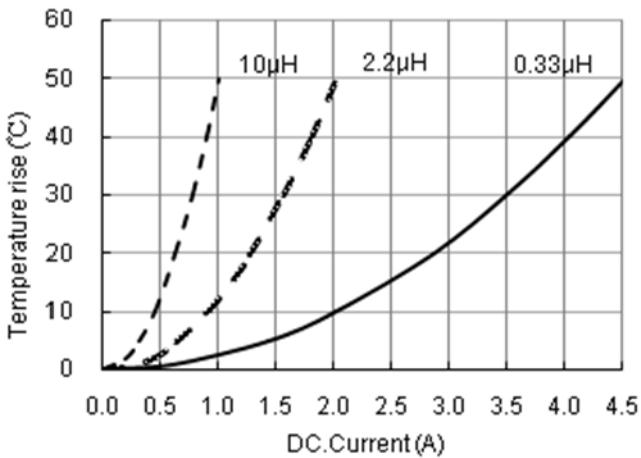


Inductance vs. DC Current Characteristics

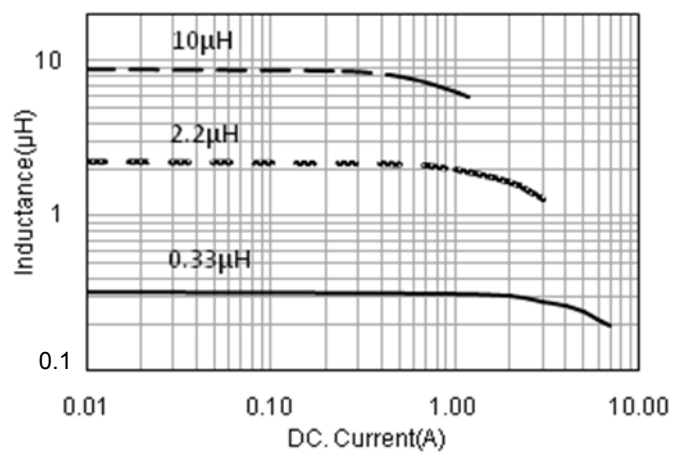


## WPN252010H Series

Temperature vs. DC Current Characteristics



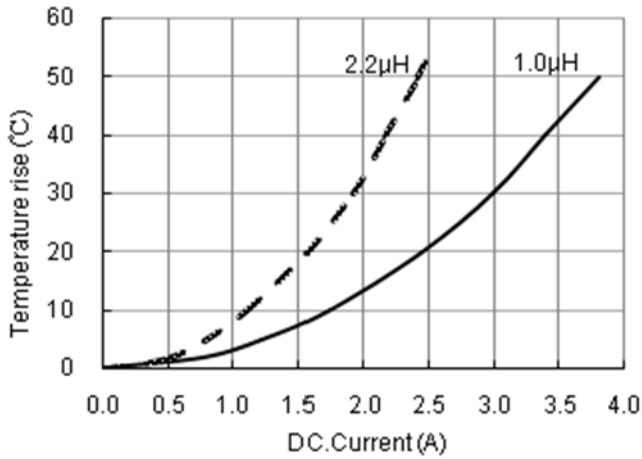
Inductance vs. DC Current Characteristics



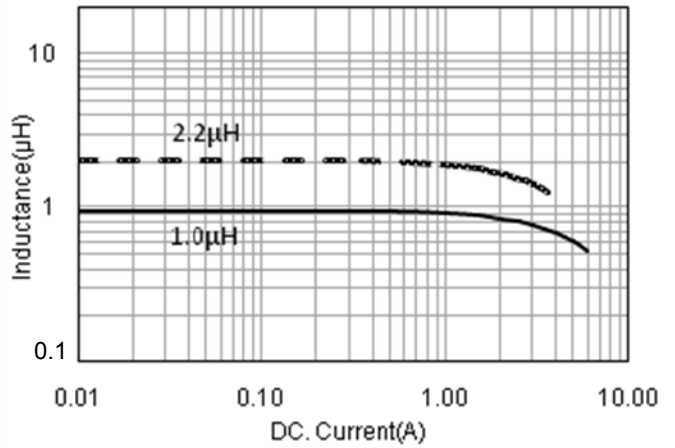
# TYPICAL ELECTRICAL CHARACTERISTICS

## WPN252012H Series

Temperature vs. DC Current Characteristics

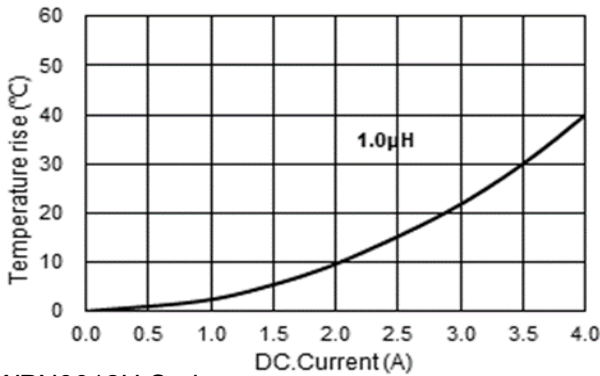


Inductance vs. DC Current Characteristics

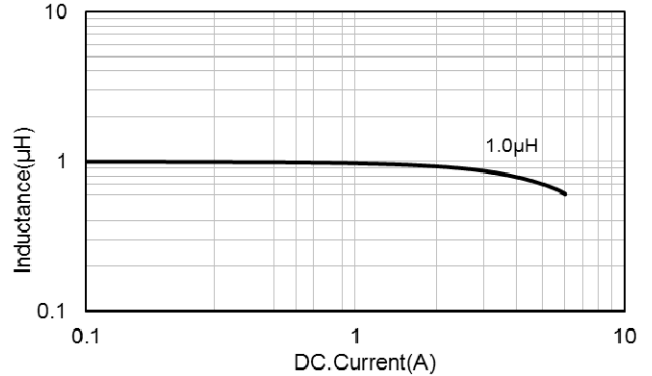


## WPN252012E Series

Temperature vs. DC Current Characteristics

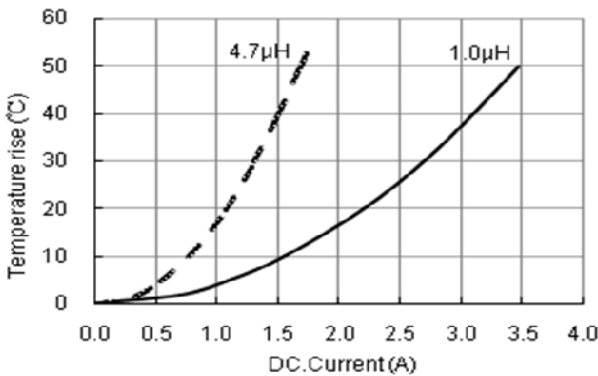


Inductance vs. DC Current Characteristics

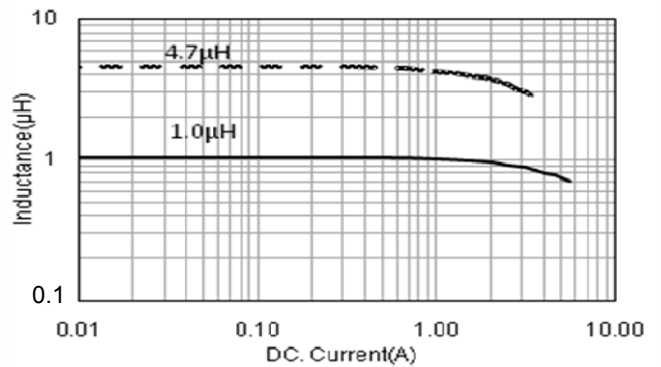


## WPN3012H Series

Temperature vs. DC Current Characteristics

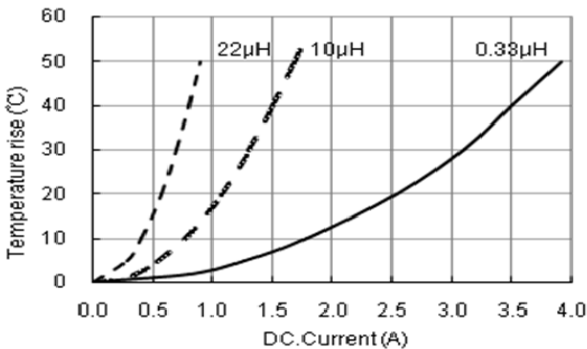


Inductance vs. DC Current Characteristics

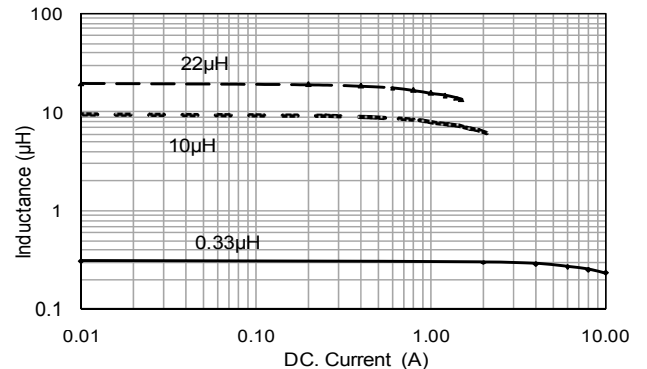


## WPN4012H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



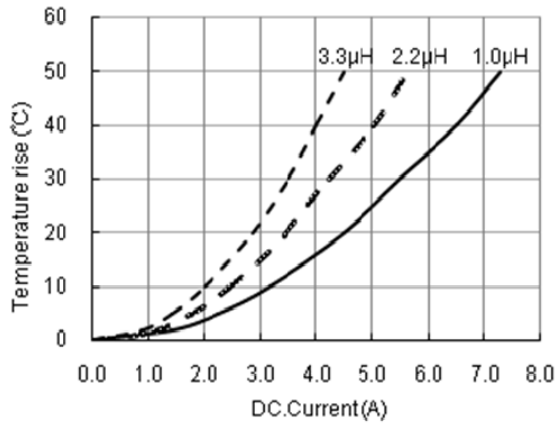
The specifications subject to change without notice. Please check our website for latest information. Revised 2016/0//21



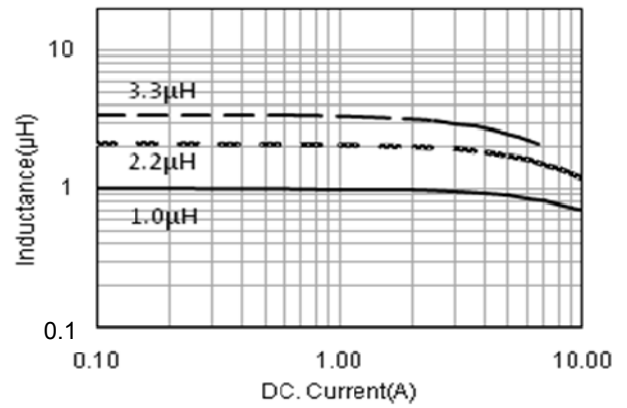
# TYPICAL ELECTRICAL CHARACTERISTICS

WPN4020H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



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