

## Wire Wound SMD Power Inductors – FHD Series

Operating temperature range : -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

### 特征

- 采用金屬鐵磁芯，具有更高的飽和電流
- 直接在磁芯上金屬化電極，抗跌落沖擊強，經久耐用
- 閉合磁路結構設計，漏磁少，抗EMI能力強
- 低直流電阻降低能量損耗，省電省空間
- 世界一流的自動化生產設備、領先的高精度，一致性好

### APPLICATIONS

- Smart phone, set top box, VR, AR
- Notebooks, desktop computers, servers
- Portable gaming devices, personal navigation systems, personal multimedia devices
- SSD, Bluetooth, Wi-Fi module
- NB-IOT, Bluetooth headset, Smart speakers

### 用途

- 智能手機、機頂盒、虛擬現實、增強現實
- 筆記本電腦、臺式電腦、服務器
- 便攜式遊戲設備、個人導航系統、多媒體設備
- 固態硬盤、藍牙、WIFI 模塊
- 物聯網模塊、藍牙耳機、智能音箱

### PRODUCT IDENTIFICATION

FHD 201610 S -1R0 M T  
① ② ③ ④ ⑤ ⑥

① Type	
FHD	Wire Wound SMD Power Inductor

③ Feature Type	
S	S Type

④ Nominal Inductance	
Example	Nominal Value
R47	0.47μH
1R0	1.0μH

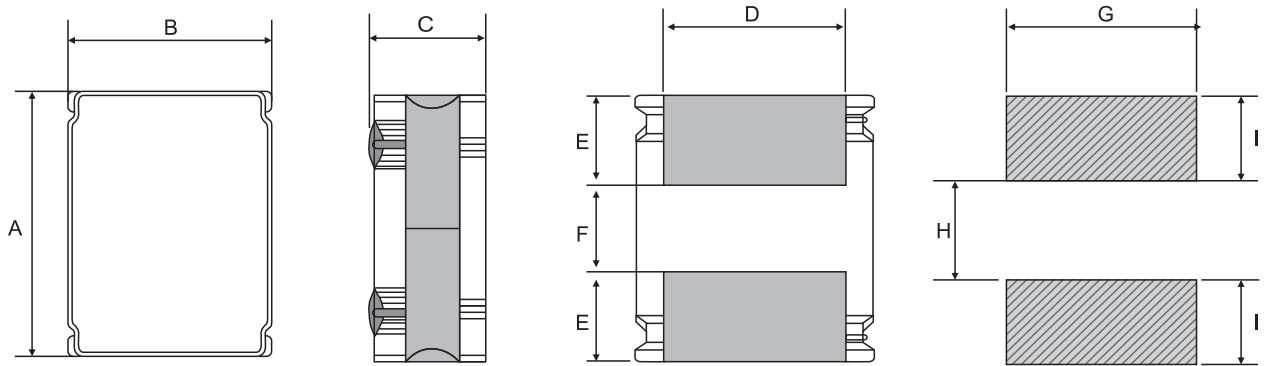
⑥ Packing	
T	Tape & Reel

② External Dimensions (L×W×H) [mm]	
201610	2.0×1.6×1.0
252010	2.5×2.0×1.0
252012	2.5×2.0×1.2
3012	3.0×3.0×1.2
3020	3.0×3.0×2.0
4012	4.0×4.0×1.2
4020	4.0×4.0×2.0

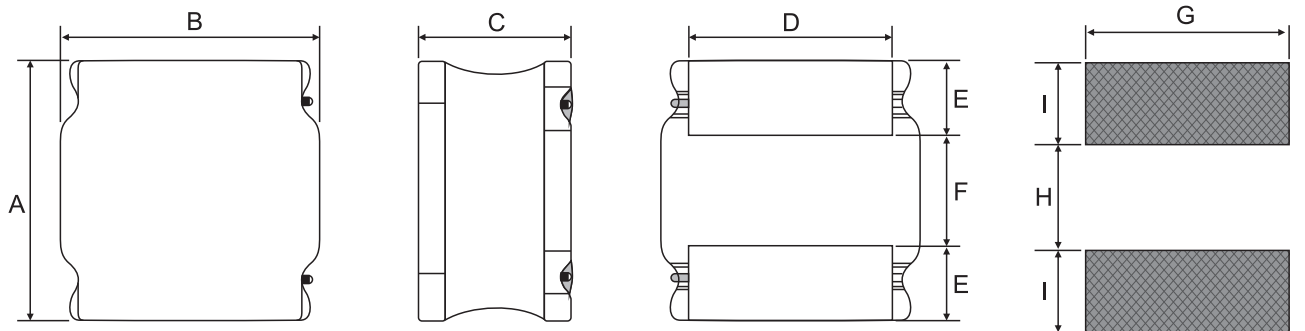
⑤ Inductance Tolerance	
M	±20%
N	±30%

**SHAPE AND DIMENSIONS**

**Fig.1**



**Fig.2**



Unit: mm

Series	Shape	A	B	C	D	E	F	a Typ.	b Typ.	c Typ.
FHD201610	Fig.1	2.0±0.2	1.6±0.2	1.08 Max.	1.5±0.2	0.6±0.2	0.8±0.2	0.7	0.7	1.7
FHD252010	Fig.1	2.5±0.2	2.0±0.2	1.05 Max.	1.65±0.2	0.8±0.2	0.8±0.2	0.8	0.85	2.0
FHD252012	Fig.1	2.5±0.2	2.0±0.2	1.26 Max.	1.65±0.2	0.8±0.2	0.8±0.2	0.8	0.85	2.0
FHD3012	Fig.2	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	0.80	3.2
FHD3020	Fig.2	3.0±0.2	3.0±0.2	2.0 Max.	2.6±0.2	0.75±0.2	1.5±0.2	1.5	0.80	3.2
FHD4012	Fig.2	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	1.10	3.7
FHD4020	Fig.2	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	1.10	3.7

## SPECIFICATIONS

### FHD201610S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	$\mu\text{H}$	$\Omega$	$\Omega$	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD201610S-R24MT	0.24±20%	0.040	0.033	4.50	5.50	3.00	3.45
FHD201610S-R33MT	0.33±20%	0.049	0.041	4.40	5.20	2.70	3.10
FHD201610S-R47MT	0.47±20%	0.049	0.041	4.06	4.70	2.70	3.10
FHD201610S-R56MT	0.56±20%	0.053	0.043	3.80	4.50	2.60	2.80
FHD201610S-R68MT	0.68±20%	0.065	0.057	3.50	4.00	2.50	2.80
FHD201610S-1R0MT	1.0±20%	0.095	0.078	3.30	3.80	2.00	2.30
FHD201610S-1R5MT	1.5±20%	0.130	0.110	1.95	2.30	1.70	2.00
FHD201610S-2R2MT	2.2±20%	0.180	0.160	1.90	2.15	1.40	1.60
FHD201610S-3R3MT	3.3±20%	0.307	0.245	1.40	1.60	1.10	1.30
FHD201610S-4R7MT	4.7±20%	0.425	0.370	1.10	1.40	0.90	1.00
FHD201610S-6R8MT	6.8±20%	0.620	0.500	0.95	1.10	0.70	0.82
FHD201610S-8R2MT	8.2±20%	0.870	0.670	0.86	1.00	0.66	0.76
FHD201610S-100MT	10±20%	0.875	0.700	0.80	0.95	0.60	0.70

### FHD252010S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	$\mu\text{H}$	$\Omega$	$\Omega$	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD252010S-R24MT	0.24±20%	0.033	0.025	6.10	7.10	3.70	4.50
FHD252010S-R33MT	0.33±20%	0.039	0.033	4.80	5.50	3.50	4.05
FHD252010S-R47MT	0.47±20%	0.045	0.040	4.40	5.20	3.20	3.60
FHD252010S-R68MT	0.68±20%	0.059	0.049	3.20	3.60	2.75	3.20
FHD252010S-1R0MT	1.0±20%	0.085	0.071	3.10	3.50	2.20	2.50
FHD252010S-1R5MT	1.5±20%	0.106	0.090	2.60	3.00	2.00	2.30
FHD252010S-2R2MT	2.2±20%	0.155	0.129	1.90	2.20	1.50	1.80
FHD252010S-3R3MT	3.3±20%	0.235	0.196	1.60	1.80	1.20	1.40
FHD252010S-4R7MT	4.7±20%	0.290	0.255	1.30	1.50	1.00	1.10
FHD252010S-6R8MT	6.8±20%	0.480	0.380	1.00	1.15	0.95	1.00
FHD252010S-100MT	10±20%	0.740	0.630	0.90	1.00	0.65	0.75

## SPECIFICATIONS

### FHD252012S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD252012S-R24MT	0.24±20%	0.023	0.019	6.50	7.80	4.05	4.70
FHD252012S-R33MT	0.33±20%	0.028	0.023	5.35	6.30	3.70	4.30
FHD252012S-R47MT	0.47±20%	0.035	0.029	4.90	5.60	3.45	4.00
FHD252012S-R68MT	0.68±20%	0.045	0.039	3.80	4.50	3.15	3.60
FHD252012S-1R0MT	1.0±20%	0.054	0.048	3.60	4.20	3.00	3.40
FHD252012S-1R5MT	1.5±20%	0.072	0.060	2.90	3.50	2.40	2.80
FHD252012S-2R2MT	2.2±20%	0.120	0.100	2.60	3.00	1.90	2.15
FHD252012S-3R3MT	3.3±20%	0.215	0.175	1.70	2.10	1.50	1.80
FHD252012S-4R7MT	4.7±20%	0.260	0.225	1.60	1.90	1.25	1.45
FHD252012S-6R8MT	6.8±20%	0.366	0.305	1.20	1.40	0.95	1.10
FHD252012S-100MT	10±20%	0.480	0.435	1.10	1.35	0.85	1.00

### FHD3012S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD3012S-R33MT	0.33±20%	0.032	0.024	7.20	8.90	4.10	4.80
FHD3012S-R47MT	0.47±20%	0.040	0.031	6.80	8.00	3.80	4.20
FHD3012S-1R0MT	1.0±20%	0.054	0.046	4.20	5.40	2.70	3.10
FHD3012S-1R5MT	1.5±20%	0.074	0.062	3.40	4.10	2.50	2.90
FHD3012S-2R2MT	2.2±20%	0.108	0.090	2.80	3.35	2.05	2.35
FHD3012S-3R3MT	3.3±20%	0.185	0.144	2.20	2.60	1.50	1.80
FHD3012S-4R7MT	4.7±20%	0.255	0.215	2.00	2.50	1.15	1.35
FHD3012S-6R8MT	6.8±20%	0.340	0.290	1.60	1.90	1.10	1.25
FHD3012S-100MT	10±20%	0.474	0.395	1.20	1.45	1.00	1.15

## SPECIFICATIONS

### FHD3020S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD3020S-R24MT	0.24±20%	0.020	0.016	12.5	14.5	6.0	7.1
FHD3020S-R47MT	0.47±20%	0.024	0.019	11.0	12.5	5.8	7.0
FHD3020S-1R0MT	1.0±20%	0.045	0.036	8.00	10.0	4.5	5.2
FHD3020S-3R3MT	3.3±20%	0.124	0.098	4.60	5.50	2.5	3.0

### FHD4012S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD4012S-R56MT	0.56±20%	0.050	0.040	6.00	7.00	3.20	3.80
FHD4012S-R68MT	0.68±20%	0.055	0.042	5.20	6.20	3.25	3.80
FHD4012S-1R0MT	1.0±20%	0.059	0.049	3.80	4.60	3.00	3.50
FHD4012S-2R2MT	2.2±20%	0.090	0.075	2.80	3.30	2.50	3.00
FHD4012S-3R3MT	3.3±20%	0.130	0.106	2.80	3.30	2.00	2.50
FHD4012S-4R7MT	4.7±20%	0.175	0.145	2.30	2.60	1.80	2.10
FHD4012S-6R8MT	6.8±20%	0.230	0.190	1.60	2.20	1.50	1.75
FHD4012S-8R2MT	8.2±20%	0.273	0.210	1.58	1.95	1.46	1.68
FHD4012S-100MT	10±20%	0.360	0.300	1.55	1.85	0.85	1.00

## SPECIFICATIONS

### FHD4020S Series

Part Number	Inductance	DC Resistance		Saturation Current		Heat Rating Current	
	1MHz/1V	Max.	Typ.	Max.	Typ.	Max.	Typ.
Units	μH	Ω	Ω	A	A	A	A
Symbol	L	DCR		Isat		Irms	
FHD4020S-R24MT	0.24±20%	0.017	0.013	14.0	17.0	6.00	7.00
FHD4020S-R33MT	0.33±20%	0.020	0.015	13.0	16.0	5.90	6.80
FHD4020S-R47MT	0.47±20%	0.022	0.016	11.0	12.0	5.90	6.80
FHD4020S-R68MT	0.68±20%	0.0245	0.0192	9.00	11.5	5.80	6.70
FHD4020S-1R0MT	1.0±20%	0.028	0.023	8.70	11.0	5.80	6.70
FHD4020S-1R5MT	1.5±20%	0.038	0.032	7.70	9.60	5.20	6.00
FHD4020S-2R2MT	2.2±20%	0.056	0.046	6.00	7.50	4.00	4.80
FHD4020S-3R3MT	3.3±20%	0.088	0.073	4.70	5.90	3.40	4.00
FHD4020S-4R7MT	4.7±20%	0.115	0.095	4.00	4.90	2.85	3.30
FHD4020S-6R8MT	6.8±20%	0.160	0.130	3.00	4.20	2.40	2.80
FHD4020S-8R2MT	8.2±20%	0.220	0.175	2.90	3.80	2.10	2.40
FHD4020S-100MT	10±20%	0.220	0.190	2.80	3.50	2.00	2.35
FHD4020S-150MT	15±20%	0.400	0.305	2.10	2.80	1.00	1.20
FHD4020S-220MT	22±20%	0.545	0.415	1.30	1.50	0.95	1.10
FHD4020S-330MT	33±20%	0.850	0.650	1.20	1.40	0.70	0.86
FHD4020S-470MT	47±20%	1.200	0.950	1.10	1.30	0.56	0.66

Note: ※1: Rated current: Isat(max.) or Irms(max.), whichever is smaller;

※2: Isat: Max. Value, DC current at which the inductance drops less than 30% from its value without current; Typ. Value, DC current at which the inductance drops 30% from its value without current;

※3: Irms: DC current that causes the temperature rise ( $\Delta T$ ) from 20°C ambient. For Max. Value,  $\Delta T < 40^\circ\text{C}$ ; for Typ. Value,  $\Delta T$  is approximate 40°C.

The part temperature (ambient + temp. rise) should not exceed 125°C under worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application

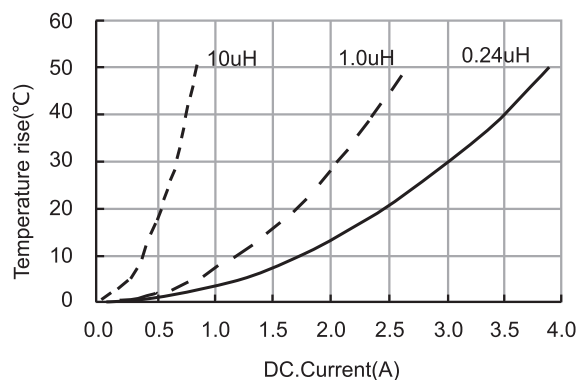
※4: For FHD2016 & FHD2520 size inductors, absolute maximum voltage: DC 25V; For FHD30 & FHD40 size inductors, absolute maximum voltage: DC 40V;

Typical Electrical Characteristics: Please refer to appendix

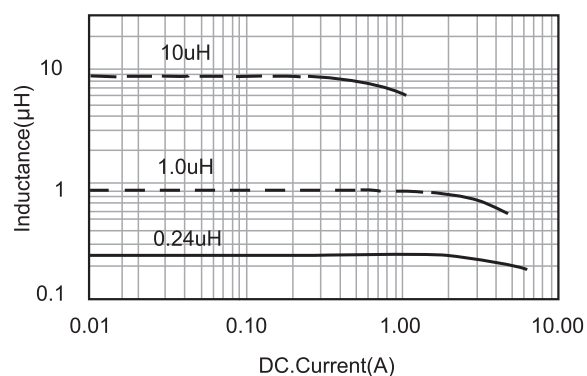
**TYPICAL ELECTRICAL CHARACTERISTICS**

**FHD201610S Series**

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics

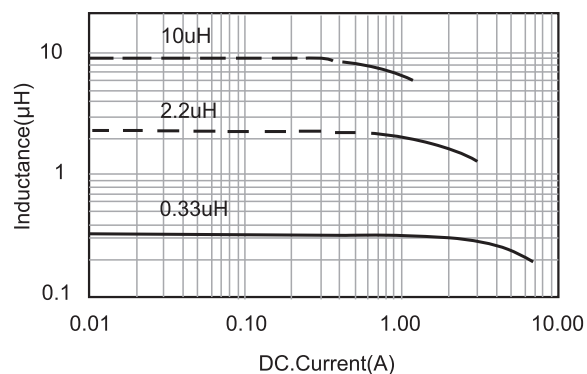


**FHD252010S Series**

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics

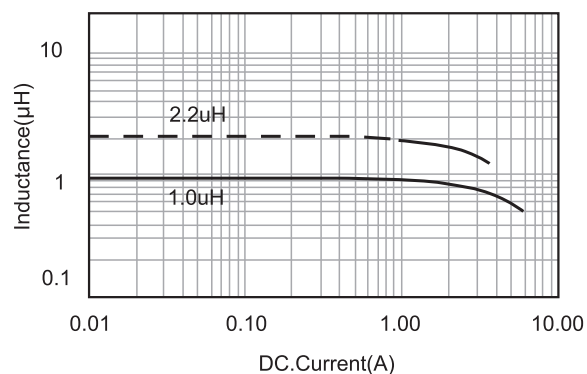


**FHD252012S Series**

Temperature vs. DC Current Characteristics

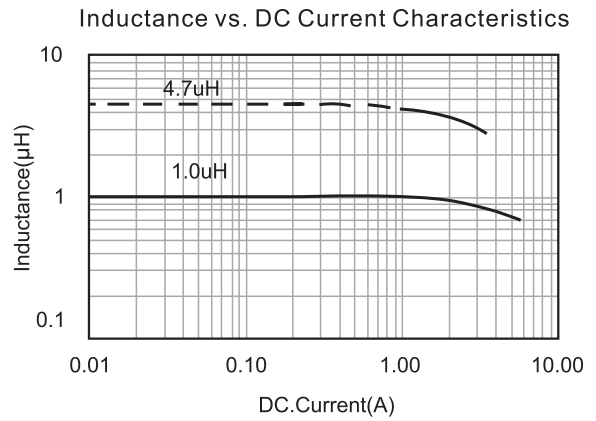


Inductance vs. DC Current Characteristics

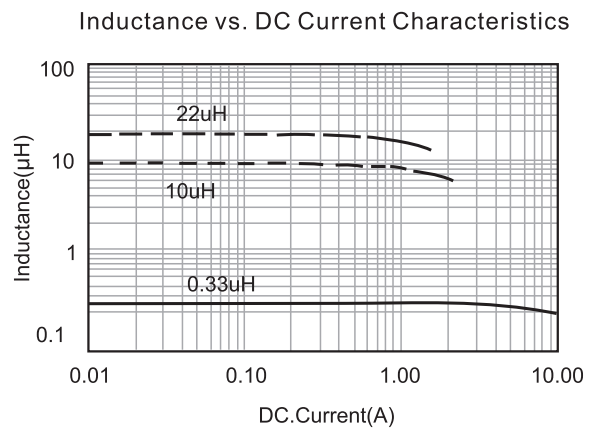


**TYPICAL ELECTRICAL CHARACTERISTICS**

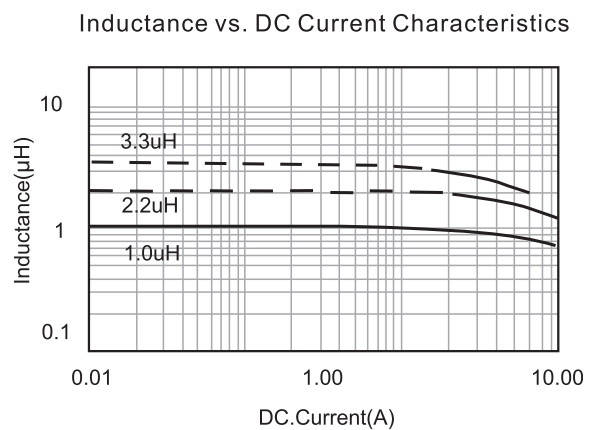
**FHD3012S Series**



**FHD4012S Series**



**FHD4020S Series**





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