

1. 初始磁导率 μ_i

初始磁导率是磁性材料的磁导率 (B/H)在磁化曲线始端的极限值, 即

$$\mu_i = \frac{1}{\mu_0} \lim_{H \rightarrow 0} \frac{B}{H}$$

式中 μ_0 为真空磁导率($4\pi \times 10^{-7}$ H/m)

H 为磁场强度(A/m)

B 为磁通密度(T)

2. 有效磁导率 μ_e

在闭合磁路中, 如果漏磁可忽略, 可以用有效磁导率来表征磁芯的性能。

$$\mu_e = \frac{L}{\mu_0 N^2} \cdot \frac{l_e}{A_e}$$

式中 L 为装有磁芯的线圈的电感量(H)

N 为线圈匝数

l_e 为有效磁路长度(m)

A_e 为有效截面积 (m^2)

3. 饱和磁通密度 B_s (T)

磁化到饱和状态的磁通密度。见图 1。

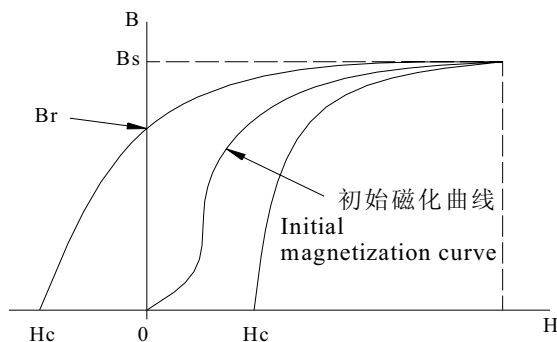


图 1 (Fig 1)

4. 剩余磁通密度 B_r (T)

从饱和状态去除磁场后, 剩余的磁通密度。见图 1。

1. Initial permeability, μ_i

The initial permeability μ_i is the limit value at the initial magnetization curve's origin point and is given by the following formula:

$$\mu_i = \frac{1}{\mu_0} \lim_{H \rightarrow 0} \frac{B}{H}$$

Where

μ_0 : Permeability of vacuum ($4\pi \times 10^{-7}$ H / m)

H: Magnetic field strength (A / m)

B: Magnetic flux density (T)

2. Effective permeability, μ_e

This is usually defined as the permeability of a core forming a closed circuit where leakage flux is negligibly small.

$$\mu_e = \frac{L}{\mu_0 N^2} \cdot \frac{l_e}{A_e}$$

Where

L: self-inductance of core with coil (H)

N: number of turns

l_e : effective magnetic path length (m)

A_e : effective cross-sectional area (m^2)

3. Saturation magnetic flux density, B_s (T)

The magnetic flux density at a magnetic field where H is up to an approximate saturation magnetic field value. (Fig. 1)

4. Residual magnetic flux density, B_r (T)

The value of flux density retained by the core when the magnetic field is reduced from the state of the effective saturation magnetic flux density to zero. (Fig. 1)

1、术语及定义

5. 矫顽力 H_c (A/m)

从饱和状态去除磁场后，磁芯继续被反向磁场磁化，直至磁通密度减为零，此时的磁场强称为矫顽力。见图 1。

6. 损耗因数 $\tan \delta$

损耗因数是磁滞损耗、涡流损耗和剩余损耗三者之和

$$\tan \delta = \tan \delta h + \tan \delta e + \tan \delta r$$

式中 $\tan \delta h$ 为磁滞损耗因数

$\tan \delta e$ 为涡流损耗因数

$\tan \delta r$ 为剩余损耗因数

7. 相对损耗因数 $\tan \delta / \mu$

相对损耗因数是损耗因数与磁导率之比：

$\tan \delta / \mu_i$ (适用于材料)

$\tan \delta / \mu_e$ (适用于磁路中含有气隙的磁芯)

8. 品质因数 Q

品质因数为损耗因数的倒数：

$$Q = 1 / \tan \delta$$

9. 温度系数 α_μ (1/K)

温度系数为温度在 T_1 和 T_2 范围内变化时，每变化 1K 相应的磁导率的相对变化量：

$$\alpha_\mu = \frac{\mu_2 - \mu_1}{\mu_1} \cdot \frac{1}{T_2 - T_1} \quad (T_2 > T_1)$$

式中 μ_1 为温度为 T_1 时的磁导率

μ_2 为温度为 T_2 时的磁导率

10. 相对温度系数 $\alpha_{\mu r}$ (1/K)

温度系数和磁导率之比，即

$$\alpha_{\mu r} = \frac{\mu_2 - \mu_1}{\mu_2^2} \cdot \frac{1}{T_2 - T_1} \quad (T_2 > T_1)$$

11. 居里温度 T_c (°C)

在该温度下材料由铁磁性(或亚铁磁性)转变成顺磁性。见图 2。

5. Coercivity, H_c (A/m)

The value of magnetic field strength whereby the flux density becomes zero under the intensification, in the opposite direction, of the magnetic field. (Fig.1)

6. Loss factor, $\tan \delta$

This is the sum of the hysteresis loss factor, eddy current loss factor and residual loss factor.

$$\tan \delta = \tan \delta h + \tan \delta e + \tan \delta r$$

Where $\tan \delta h$ is the hysteresis loss factor

$\tan \delta e$ is the eddy current loss factor

$\tan \delta r$ is the residual loss factor

7. Relative loss factor, $\tan \delta / \mu$

This is the ratio of loss factor to permeability.

$\tan \delta / \mu_i$ (for materials)

$\tan \delta / \mu_e$ (for cores with gaps in the magnetic circuit)

8. Quality factor, Q

This is the reciprocal of the loss factor and is given by

$$Q = 1 / \tan \delta .$$

9. Temperature coefficient, α_μ (1/K)

This is the fractional difference of permeability per 1K in a temperature range of from T_1 to T_2 .

$$\alpha_\mu = \frac{\mu_2 - \mu_1}{\mu_1} \cdot \frac{1}{T_2 - T_1} \quad (T_2 > T_1)$$

Where μ_1 : permeability at temperature T_1

μ_2 : permeability at temperature T_2

10. Relative temperature coefficient, $\alpha_{\mu r}$ (1/K)

This is the temperature coefficient per unit permeability and is given by the following equation:

$$\alpha_{\mu r} = \frac{\mu_2 - \mu_1}{\mu_2^2} \cdot \frac{1}{T_2 - T_1} \quad (T_2 > T_1)$$

11. Curie temperature, T_c

It is the critical temperature level at which the ferromagnetic state of the material changes to paramagnetic state. (Fig. 2)

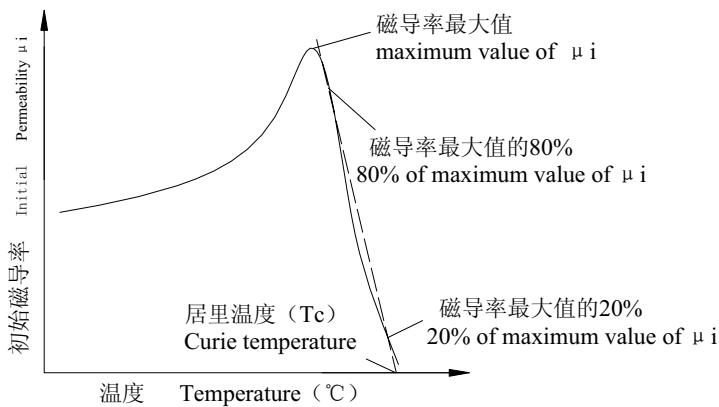


图 2 (Fig 2)

12. 减落因数 D_F

在恒温条件下，完全退磁的磁芯的磁导率随时间的衰减变化，即

$$D_F = \frac{\mu_1 - \mu_2}{\log \frac{T_2}{T_1}} \cdot \frac{1}{\mu_1} \quad (T_2 > T_1)$$

式中 μ_1 为退磁后 t_1 分钟的磁导率
 μ_2 为退磁后 t_2 分钟的磁导率

13. 电阻率 ρ (Ω/m)

具有单位截面积和单位长度的磁性材料的电阻。

14. 密度 d (kg/m^3)

单位体积材料的重量，即

$$d = W/V$$

式中 W 为磁芯的重量 (kg)
 V 为磁芯的体积 (m^3)

15. 功率损耗 P_c (kW/m^3 、 W/kg)

磁芯在高磁通密度下的单位体积损耗或单位重量损耗。该磁通密度可表示为

$$B_m = \frac{E}{4.44 f N A_e}$$

式中 E 为施加在线圈上的电压有效值 (V)
 B_m 为磁通密度的峰值 (T)

12. Disaccommodation factor, D_F

This is the factor representing the variation of permeability through time after a complete demagnetization of the core at a constant temperature.

$$D_F = \frac{\mu_1 - \mu_2}{\log \frac{T_2}{T_1}} \cdot \frac{1}{\mu_1} \quad (T_2 > T_1)$$

Where

μ_1 : permeability t_1 minutes after complete demagnetization.

μ_2 : permeability t_2 minutes after complete demagnetization.

13. Electrical resistivity, ρ (Ω/m)

This is the electrical resistance per unit length and cross-sectional area of a magnetic core.

14. Density, d (kg/m^3)

This is the weight per unit volume of a magnetic core as expressed below:

$$d = W/V$$

Where W : weight of magnetic body (kg)

V : volume of magnetic body (m^3)

15. Power loss P_c (kW/m^3 、 W/kg)

Power loss denotes the loss by an electrical transformer, such as a switching power supply, under a magnetization condition featuring a high frequency and large amplitude. Operating magnetic flux density is given by the following equation.

1、术语及定义

f 为频率 (Hz)

N 为线圈匝数

Ae 为有效截面积 (m²)

$$B_m = \frac{E}{4.44 f N A_e}$$

Where

E: voltage effective value applied to coil

B_m: peak value of magnetic flux density

f: frequency (Hz)

N: number of coil turns

A_e: effective cross-sectional area (m²)

16. 电感因数 A_L (nH / N²)

电感因数定义为具有一定形状和尺寸的磁芯上每一匝线圈产生的电感量, 即

$$A_L = L / N^2$$

式中 L 为装有磁芯的线圈的电感量 (H)

N 为线圈匝数

16. Inductance factor A_L (nH / N²)

This is the inductance per turn of the coil wound around the ferrite cores with definite shape and dimension.

$$A_L = L / N^2$$

Where

L: inductance of the coil with ferrite core.

N: turns of the coil

2、材料特性参数

● Mn-Zn 铁氧体 Mn-Zn Ferrites

开关电源变压器用功率铁氧体材料 Power ferrite materials for SMPS

特性 Characteristics	符号 Symbol	单位 Unit	JP2	JP3	JP4A	JP4B	JP5	
初始磁导率 Initial permeability	μ_i		3000±25%	2500±25%	2300±25%	2400±25%	1400±25%	
相对损耗因数 Relative loss factor	$\tan\delta/\mu_i$	$\times 10^{-6}$			4			
饱和磁通密度 Saturation flux density	Bs	mT	25°C	480	510	510	510	485
			100°C		400	390	390	
				(800A/m)	(1194A/m)	(1194A/m)	(1194A/m)	(1600A/m)
剩磁 Remanence	Br	mT	120	117		110	190	
矫顽力 Coercivity	Hc	A/m	16	12		13	35	
功率损耗 Power loss (f=16kHz,B=150mT)	Pc	kW/m ³	25°C	$\leq 12^*$				
			60°C	$\leq 11^*$				
			80°C					
			100°C	$\leq 12^*$				
功率损耗 Power loss (f=25kHz,B=200mT)	Pc	kW/m ³	25°C			130		
			60°C			90		
			80°C					
			100°C			100		
功率损耗 Power loss (f=100kHz,B=200mT)	Pc	kW/m ³	25°C		700	650	600	
			60°C		500	500	400	
			80°C			430		
			100°C		600	400	300	
			120°C				380	
功率损耗 Power loss (f=500kHz,B=50mT)	Pc	kW/m ³	25°C				130	
			60°C				80	
			80°C					
			100°C				80	
居里温度 Curie temperature	Tc	°C	>200	>230	>235	>230	>240	
电阻 Resistivity	ρ	$\Omega \cdot m$	1	10	3	6.5		
密度 Density	d	kg/m ³ × 10 ³	4.8	4.8	4.8	4.8	4.8	

注 Note: 1) * 单位 Unit W/kg

2) 如无说明, 各项数值均系用环型磁芯在室温下测得。

The values were obtained with toroidal cores at room temperature unless otherwise shown.

2、材料特性参数

● Mn-Zn 铁氧体 Mn-Zn Ferrites

回扫变压器用功率铁氧体材料 Power ferrite materials for FBT

特性 Characteristics	符号 Symbol	单位 Unit	JV2A		JV4
初始磁导率 Initial permeability	μ_i		2000±25%		2300±25%
相对损耗因数 Relative loss factor	$\tan\delta/\mu_i$	$\times 10^{-6}$			4
饱和磁通密度 Saturation flux density (H=1194A/m)	Bs	mT	25°C	520	500
			100°C	410	380
剩磁 Remanence	Br	mT			130
矫顽力 Coercivity	Hc	A/m			14
功率损耗 Power loss (f=16kHz,B=150mT)	Pc	W/kg	25°C	9.0	
			60°C	5.5	
			80°C	4.2	
			100°C	3.5	3
功率损耗 Power loss (f=64kHz,B=200mT)	Pc	W/kg	25°C		
			60°C		
			80°C		
			100°C		40
功率损耗 Power loss (f=100kHz,B=200mT)	Pc	W/kg	25°C	165	
			60°C	120	
			80°C	100	
			100°C	100	90
居里温度 Curie temperature	Tc	°C	>245		>215
电阻率 Resistivity	ρ	$\Omega \cdot m$	3		3
密度 Density	d	$kg/m^3 \times 10^3$	4.8		4.8

注：如无说明，各项数值均系用环型磁芯在室温下测得。

Note: The values were obtained with toroidal cores at room temperature unless otherwise shown.

● Mn-Zn 铁氧体 Mn-Zn Ferrites

高磁导率、高饱和磁通密度铁氧体材料 High μ i and high Bs ferrite material

特性 Characteristics	符号 Symbol	单位 Unit	JH5B	
初始磁导率 Initial permeability	μ i		5000±20%	
相对损耗因数 Relative loss factor	$\tan\delta/\mu$ i	$\times 10^{-6}$	≤15 (100kHz)	
饱和磁通密度 Saturation flux density	Bs	mT	23℃	480
			100℃	350
剩磁 Remanence	Br	mT	23℃	130
			100℃	100
矫顽力 Coercivity	Hc	A/m	12	
功率损耗 Power loss (f=100kHz,B=200mT)	Pc	kW/m ³	23℃	750
			60℃	600
			100℃	900
居里温度 Curie temperature	Tc	℃	>180	
密度 Density	d	kg/m ³ ×10 ³	4.8	

注：如无说明，各项数值均系用环型磁芯在室温下测得。

Note: The values were obtained with toroidal cores at room temperature unless otherwise shown.

2、材料特性参数

● Mn-Zn 铁氧体 Mn-Zn Ferrites

高磁导率铁氧体材料 High μ i ferrite materials

特性 Characteristics	符号 Symbol	单位 Unit	JH5	JH5A	JH7	JH7A
初始磁导率 Initial permeability	μ i		5500±25%	5300±25%	7000±25%	7500±25% 2000 min. (500kHz)
相对损耗因数 Relative loss factor	$\tan\delta/\mu$ i	$\times 10^{-6}$	≤ 15 (100kHz)	≤ 12 (100kHz) ≤ 180 (500kHz)	≤ 7 (10kHz)	≤ 30 (100kHz)
相对温度系数 Relative temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$ 1/K	0~1.5 (20~60°C)	-0.5~1.5 (20~70°C)	0~1.5 (-30~20°C) 0~2 (20~55°C)	
饱和磁通密度 Saturation flux density	Bs	mT	420 (800A/m)	410 (1194A/m)	400 (800A/m)	410 (1194A/m)
剩磁 Remanence	Br	mT	150	130	90	80
矫顽力 Coercivity	Hc	A/m	8	8	10.4	6
减落因数 Disaccommodation factor	D _F	$\times 10^{-6}$	≤ 3	≤ 3	≤ 3	
居里温度 Curie temperature	Tc	°C	>140	>140	>125	>130
电阻率 Resistivity	ρ	$\Omega \cdot m$	0.3	1	0.3	0.2
密度 Density	d	$kg/m^3 \times 10^3$	4.9	4.9	4.9	4.9

特性 Characteristics	符号 Symbol	单位 Unit	JH8A	JH10	JH10A	JH15
初始磁导率 Initial permeability	μ i		8000±20%	10000±30%	10000±25% 3500 min (500kHz)	15000±30%
相对损耗因数 Relative loss factor	$\tan\delta/\mu$ i	$\times 10^{-6}$	≤ 30 (100kHz)	≤ 7 (10kHz)	≤ 25 (100kHz)	≤ 7 (10kHz)
相对温度系数 Relative temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$ 1/K		-0.5~1.5 (-30~20°C) -0.5~1.5 (20~70°C)		
饱和磁通密度 Saturation flux density	Bs	mT	410 (1194A/m)	400 (1194A/m)	380 (1194A/m)	360 (1194A/m)
剩磁 Remanence	Br	mT	80	90	120	100
矫顽力 Coercivity	Hc	A/m	6	7.2	5	4.4
减落因数 Disaccommodation factor	D _F	$\times 10^{-6}$		≤ 2		
居里温度 Curie temperature	Tc	°C	>125	>120	>120	>100
电阻率 Resistivity	ρ	$\Omega \cdot m$	0.2	0.05	0.2	0.15
密度 Density	d	$kg/m^3 \times 10^3$	4.9	4.9	4.9	4.95

注：如无说明，各项数值均系用环型磁芯在室温下测得。

Note: The values were obtained with toroidal cores at room temperature unless otherwise shown.

● Mn-Zn 铁氧体 Mn-Zn Ferrites

高稳定性铁氧体材料 High stability ferrite materials

特性 Characteristics	符号 Symbol	单位 Unit	JL1	JL1A	JL2
初始磁导率 Initial permeability	μ_i		600±25%	600±25%	2000±20%
相对损耗因数 Relative loss factor	$\tan\delta/\mu_i$	$\times 10^{-6}$	≤ 25 (0.7MHz)	≤ 12 (1MHz)	≤ 5 (100kHz)
相对温度系数 Relative temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$ 1/K	0~3 (20~60°C)	0~2 (5~45°C)	-0.25~1.5 (20~60°C)
饱和磁通密度 Saturation flux Density	B _s	mT	350 (800A/m)	400 (800A/m)	350 (800A/m)
矫顽力 Coercivity	H _c	A/m	80	80	20
减落因数 Disaccommodation factor	D _F	$\times 10^{-6}$	≤ 50	≤ 15	≤ 8
居里温度 Curie temperature	T _c	°C	>200	>200	>180
电阻率 Resistivity	ρ	$\Omega \cdot m$	5	5	1
密度 Density	d	$kg/m^3 \times 10^3$	4.6	4.6	4.7

注：如无说明，各项数值均系用环型磁芯在室温下测得。

Note: The values were obtained with toroidal cores at room temperature unless otherwise shown.

2、材料特性参数

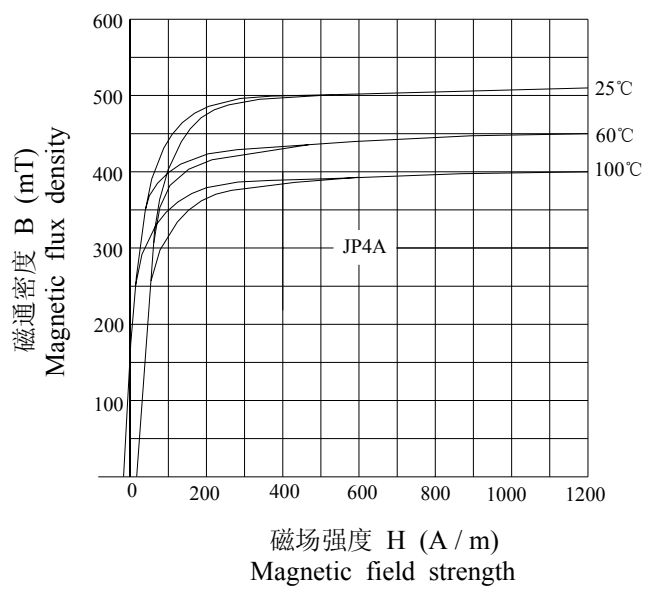
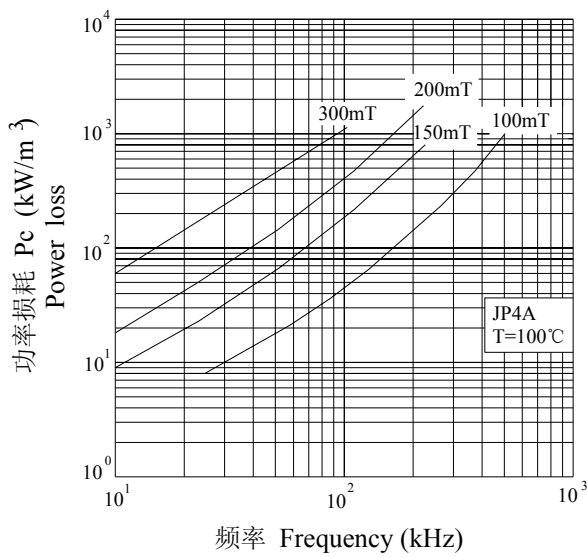
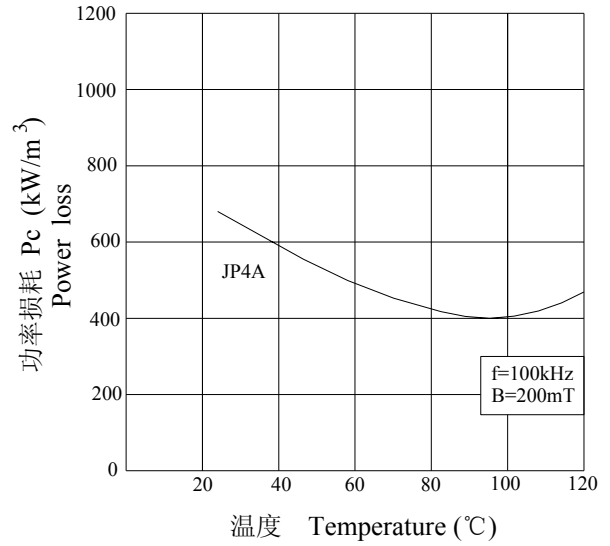
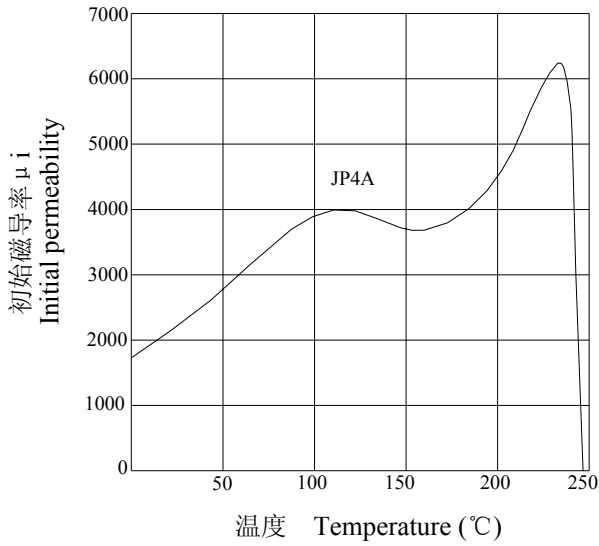
● Ni-Zn 铁氧体 Ni-Zn Ferrites

特性 Characteristics	符号 Symbol	单位 Unit	JR10	JR20	JR40	JR40A	JR100	JR100A
使用频率范围 Operation Frequency range		MHz	<150	<60	<60	<35	<35	<10
初始磁导率 Initial permeability	μ_i		10±20%	20±20%	40±20%	45±20%	100±20%	100±20%
相对损耗因数 Relative loss factor	$\tan\delta/\mu_i$	$\times 10^{-6}$	≤ 600 (7.95MHz)	≤ 330 (2.52MHz)	≤ 80 (2.52MHz)	≤ 100 (2.52MHz)	≤ 80 (2.52MHz)	≤ 55 (2.52MHz)
相对温度系数 Relative temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$ 1/K	≤ 150 (20~60°C)	≤ 15 (20~60°C)	≤ 25 (20~60°C)	≤ 8 (-5~45°C)	≤ 10 (20~60°C)	≤ 4.5 (-5~45°C)
饱和磁通密度 Saturation flux density	Bs	mT		270 (4000A/m)	300 (4000A/m)	300 (4000A/m)	350 (4000A/m)	300 (4000A/m)
居里温度 Curie temperature	Tc	°C	>460	>400	>350	>400	>350	>300
电阻率 Resistivity	ρ	$\Omega \cdot m$	10^5	10^4	10^4	10^4	10^4	10^4
密度 Density	d	$kg/m^3 \times 10^3$	4.5	4.5	4.5	4.5	4.5	4.5

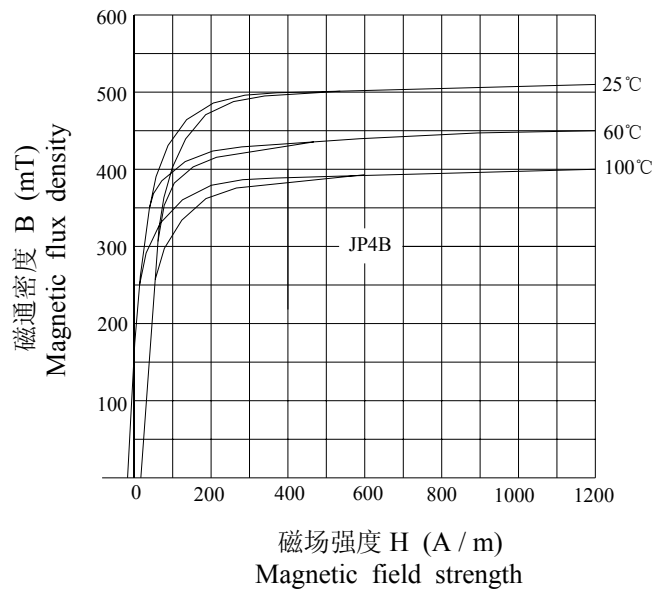
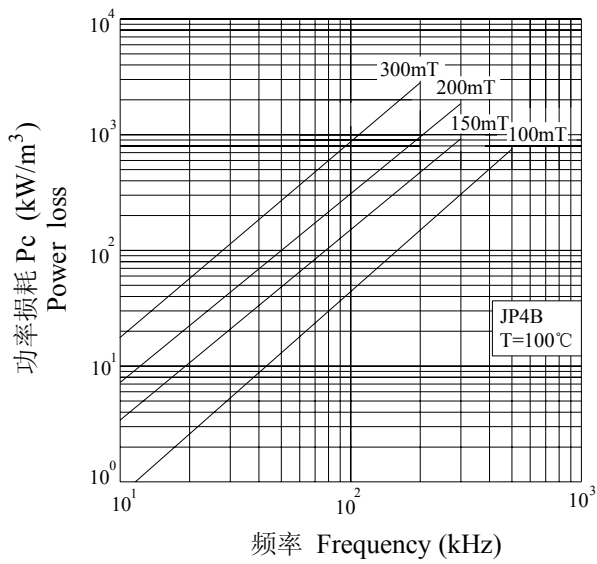
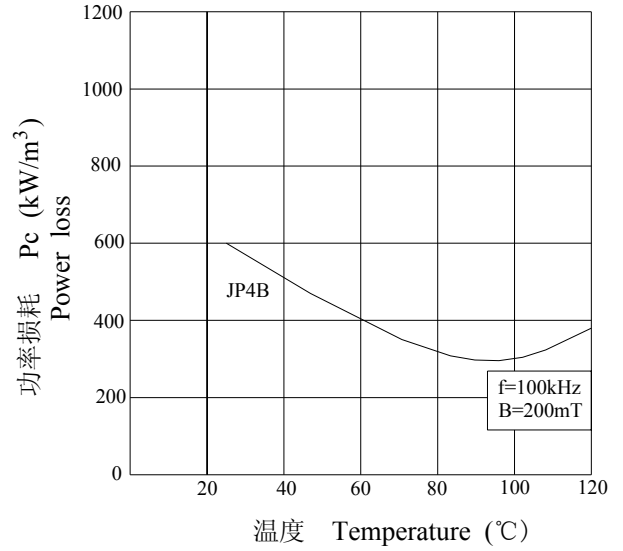
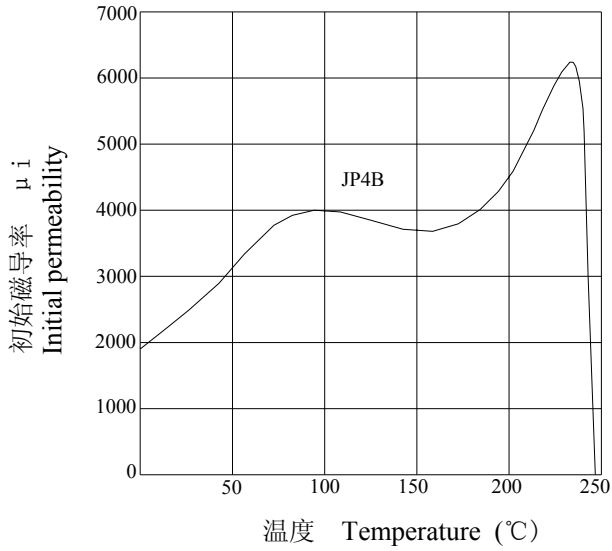
特性 Characteristics	符号 Symbol	单位 Unit	JR250	JR500	JR750	JR1K	JR1.5K
使用频率范围 Operation Frequency range		MHz	<10	<2	<1.5	<1.5	<1.0
初始磁导率 Initial permeability	μ_i		250 ±20%	500 ±20%	750 ±20%	1000 ±20%	1500 ±20%
相对损耗因数 Relative loss factor	$\tan\delta/\mu_i$	$\times 10^{-6}$	≤ 40 (0.795MHz)	≤ 30 (100kHz)	≤ 25 (100kHz)	≤ 40 (100kHz)	≤ 30 (100kHz)
相对温度系数 Relative temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$ 1/K	≤ 6 (20~60°C)	≤ 8 (20~60°C)	≤ 4 (20~60°C)	≤ 5 (20~60°C)	≤ 4 (20~60°C)
饱和磁通密度 Saturation flux density	Bs	mT	370 (1600A/m)	300 (1600A/m)	310 (1600A/m)	350 (4000A/m)	280 (1600A/m)
居里温度 Curie temperature	Tc	°C	>250	>150	>150	>150	>100
电阻率 Resistivity	ρ	$\Omega \cdot m$	10^4	10^5	10^5	10^5	10^5
密度 Density	d	$kg/m^3 \times 10^3$	4.6	5.0	5.0	5.0	4.8

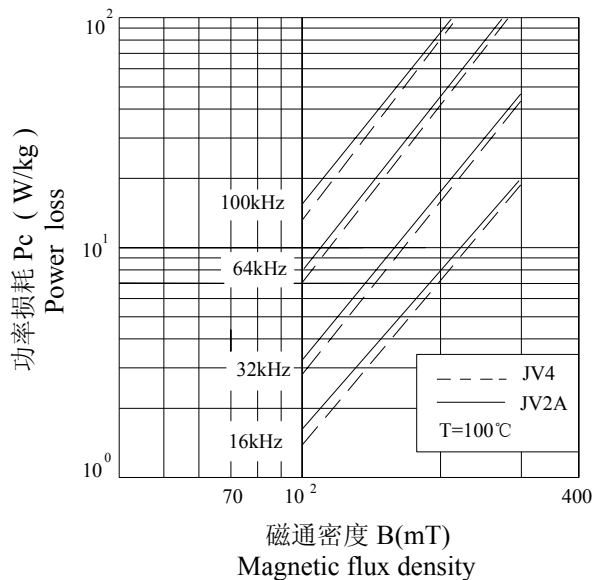
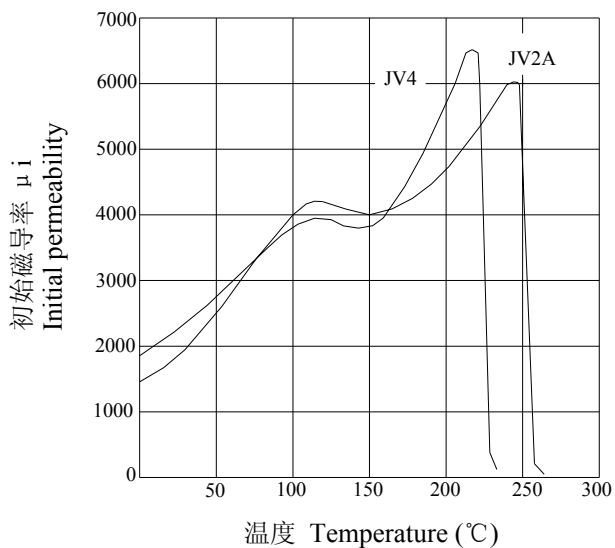
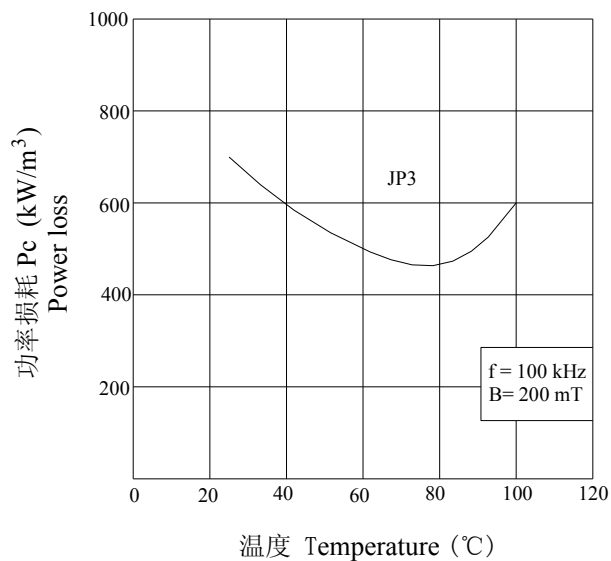
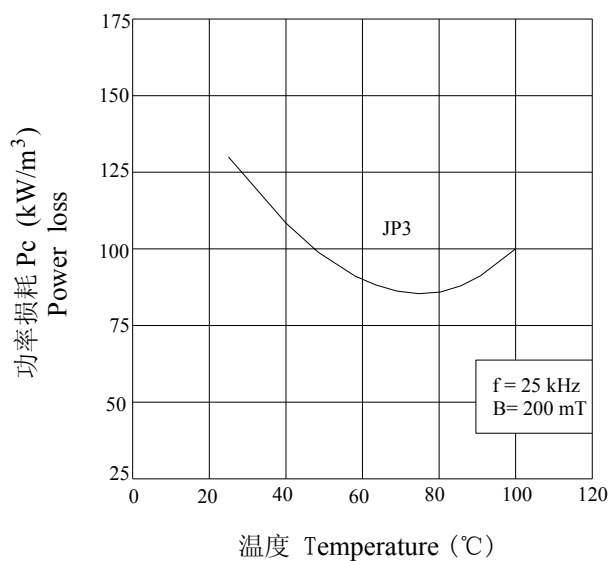
注：如无说明，各项数值均系用环型磁芯在室温下测得。

Note: The values were obtained with toroidal cores at room temperature unless otherwise shown.

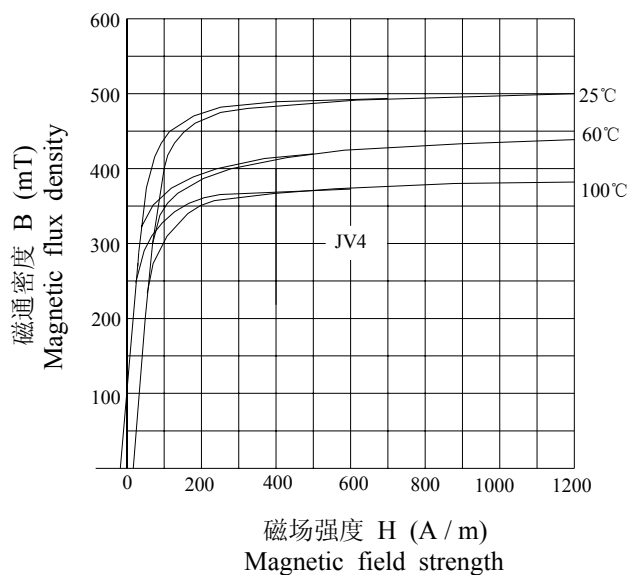
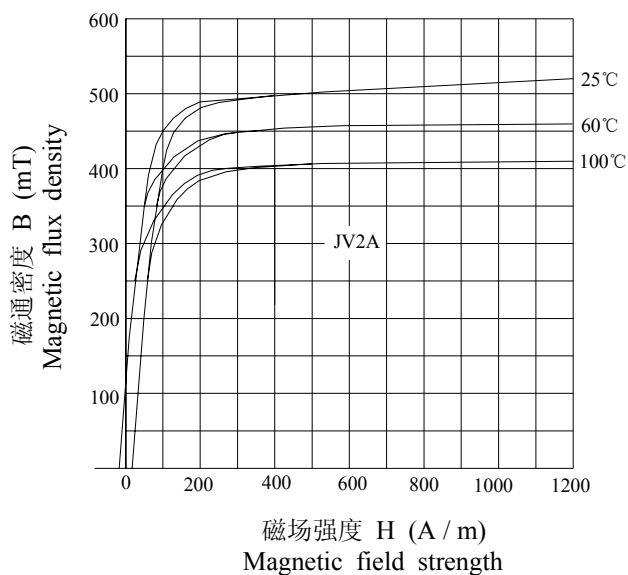
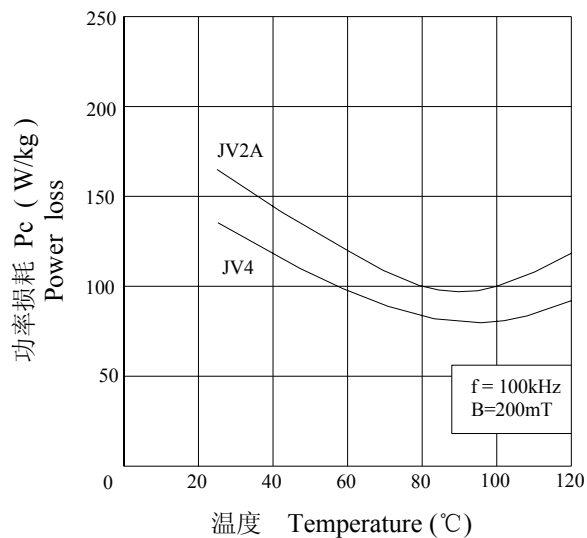
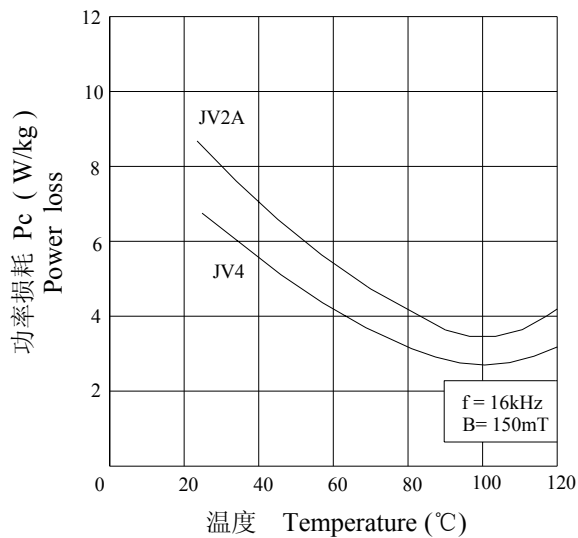


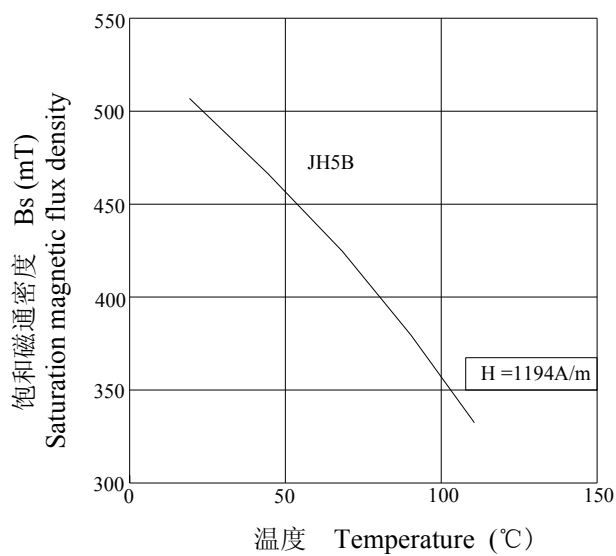
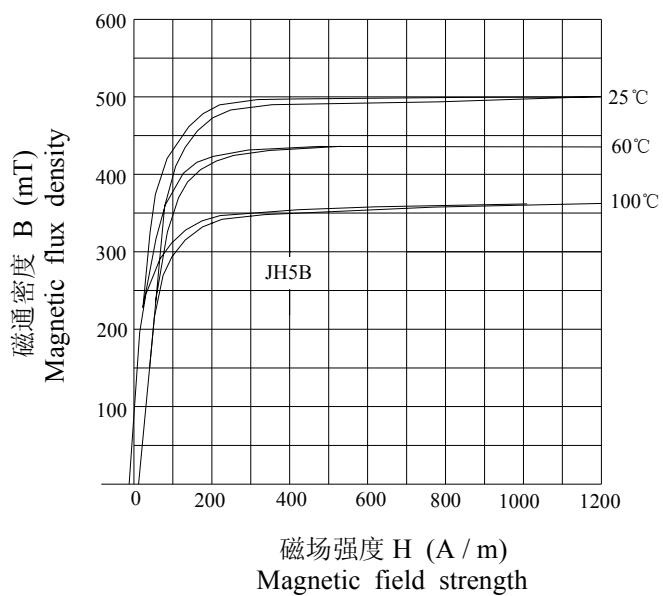
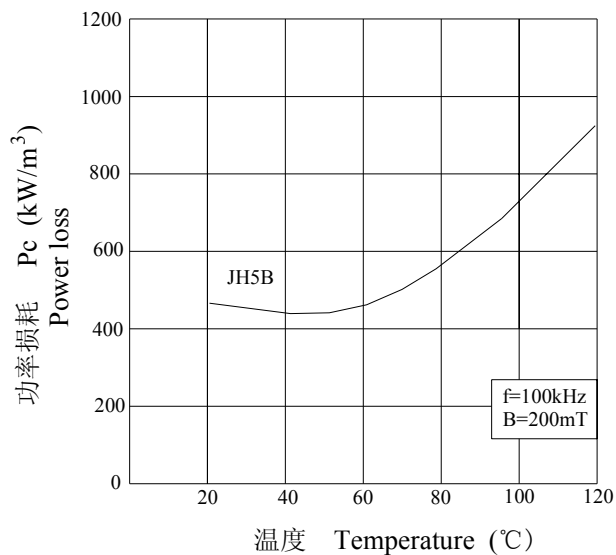
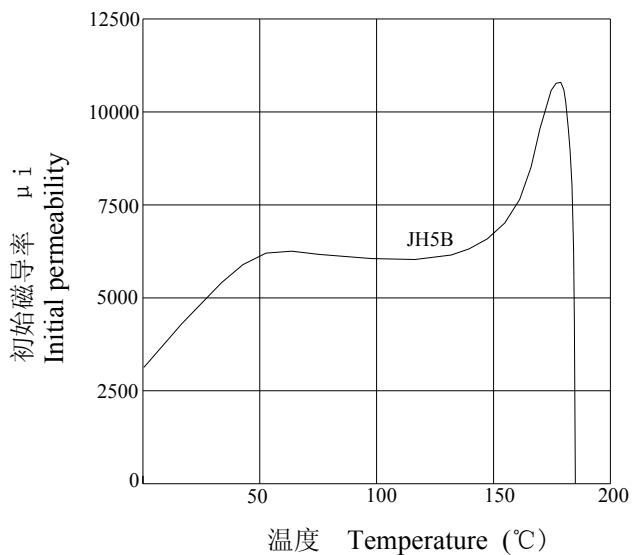
3、材料特性



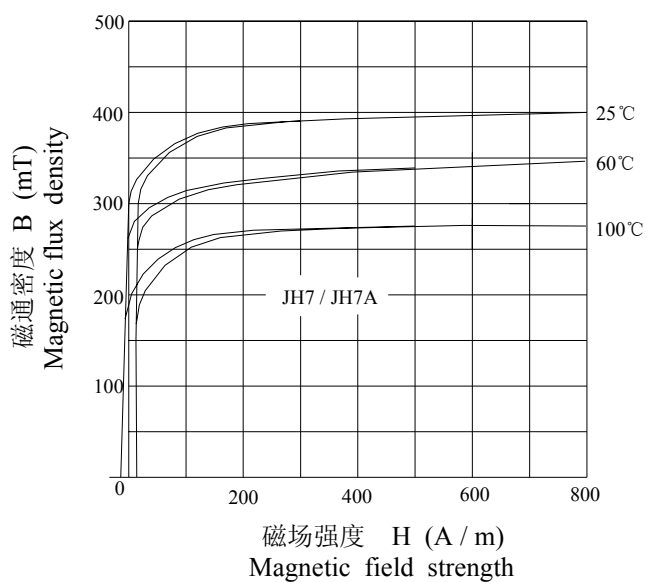
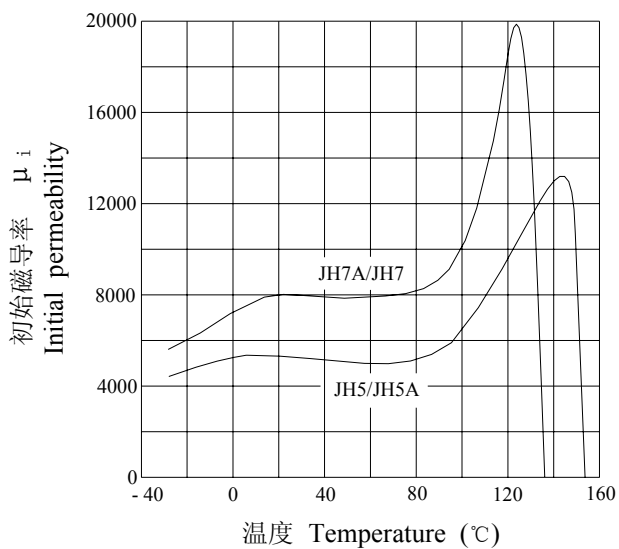
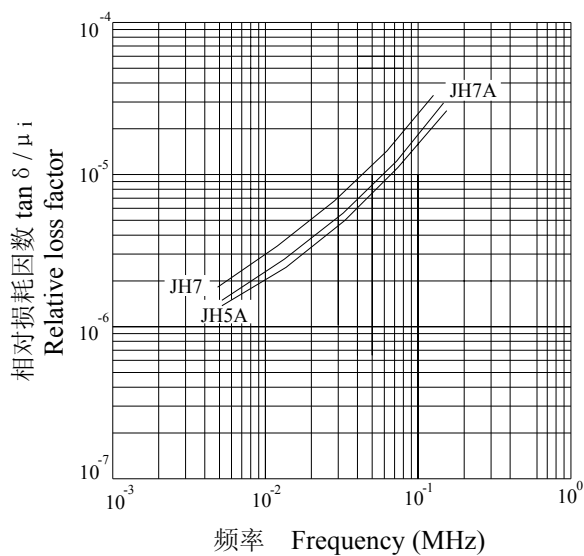
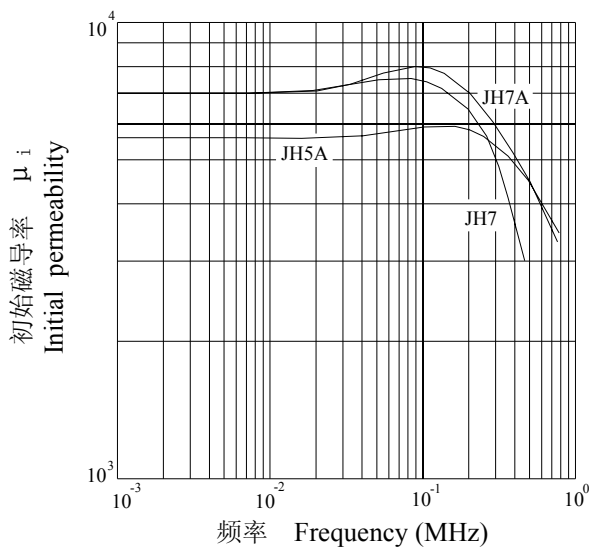


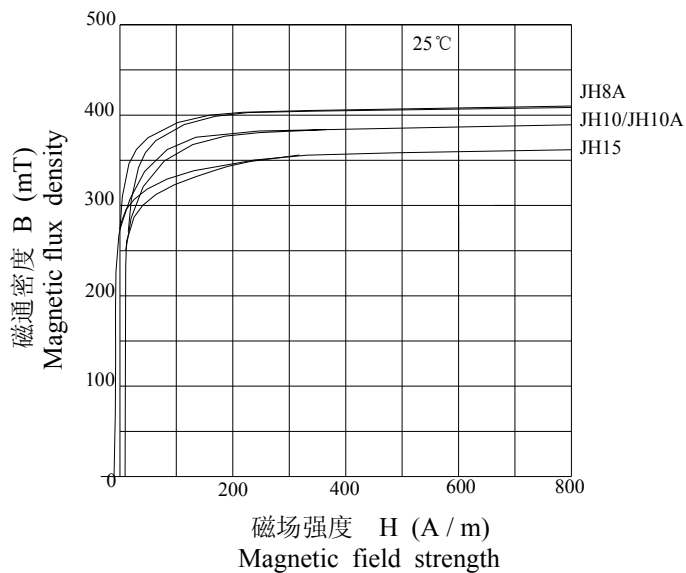
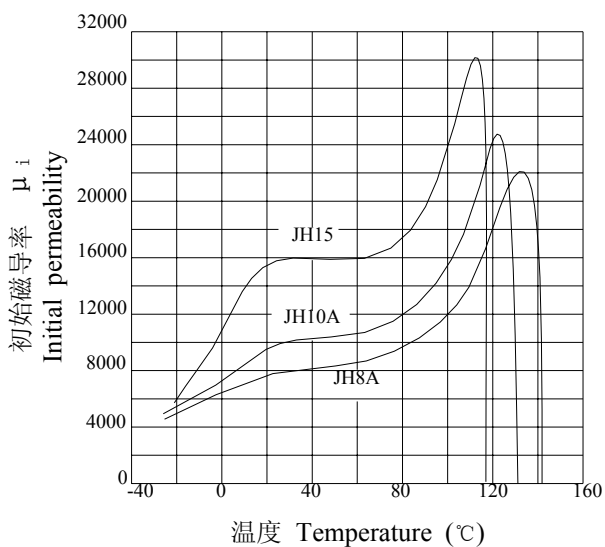
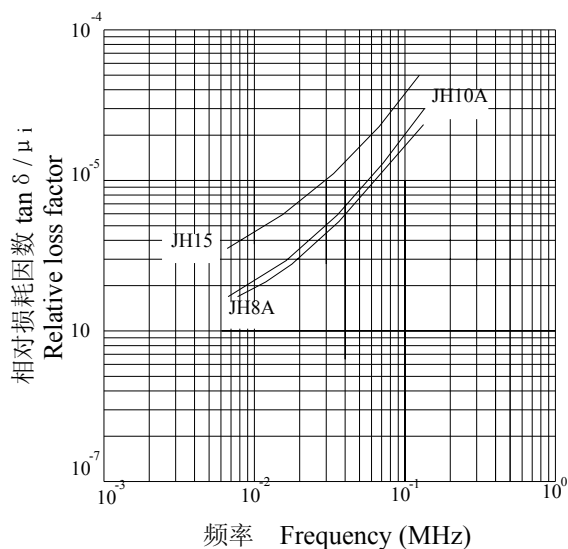
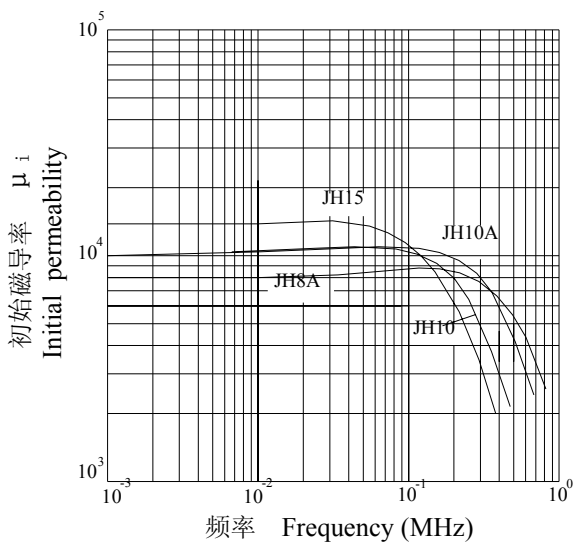
3、材料特性





3、材料特性





4、材料牌号对照表

与我公司 JP、JV 和 JH 材料系列性能和用途相对应的国外主要厂商材料牌号参见下表。

Shown below are the material brands of main international manufacturers, which characteristics and application scopes correspond to those of our JP, JV and JH material series.

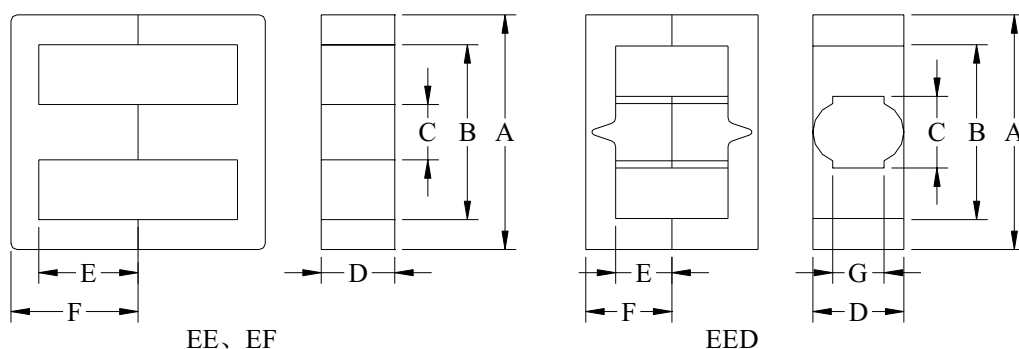
JSM	TDK	FDK	TOKIN	TOMITA	FERROXCUBE	EPCOS
JP3	PC30	6H10	2500B		3C85	N27
JP4A	PC40	6H20	BH2	2G8	3C90/3C94	N67/N87
JP4B	PC44	6H40	BH1		3C96	
JP5	PC50	7H10/7H20	B40		3F35	N49
JV2A	HV22	5H20			3C15	N62/N53
JV4	HV45	5H40			3C30	
JH5B	DN50		5000B	2G4		
JH5/JH5A	HS52	2H06	5H	2H4A	3E4	T35
JH7/JH7A	H5B2/HS72	2H07	7H	2G1	3E25/3E27	T37/T44
JH10	H5C2/HS10	2H10	10H	2E2B	3E5	T38/T42
JH15	H5C3	2H15	15H	2H1	3E7	T46

JSM	HITACHI	NICERA	KAWATETSU	SAMWHA	MMG	TPC
JP3		2M		PL-5	F44	B1
JP4A	ML24D	NC-2H	MB3	PL-7	F45	B2/F1
JP4B	ML25D	2HM5/2HM4	MB4	PL-9		F2
JP5	ML12D	5M				F4
JV2A				SM-19B		B3/B5
JV4				SM-19C		B7
JH5B	MQ53D				F9C	
JH5/JH5A		NC-5Y	MA055	SM-50	F10	A4/A5
JH7/JH7A	MP70D	NC-7	MA07A	SM-70S		A3
JH10	MP10T/MQ10T	NC-10H	MA100	SM-100/SM-100S	F39	A2
JH15	MP15T	15H		SM-150		

4、材料牌号对照表

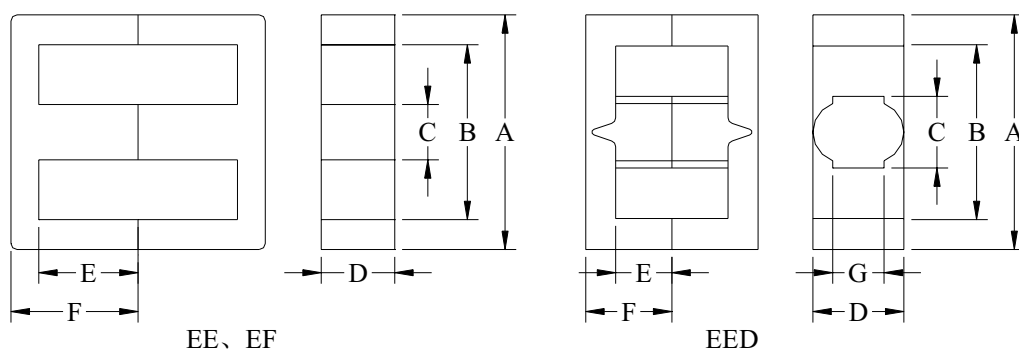
JSM	MAGNETICS	ACME	KASCHKE	ISKRA	VOGT	ISU
JP3	F	P5	K2006	15G	Fi322	PM2/PM2A
JP4A	P/R	P4	K2008	45G	Fi324	PM5/PM7
JP4B		P41				
JP5			K2001	75G		
JV2A						
JV4						
JH5B						
JH5/JH5A		A05	K5000			
JH7/JH7A	J	A07	K6000	22G	Fi360	HM3/HM3A
JH10	W	A10	K10000	12G	Fi410	HM5A
JH15			K15000	52G		

5、EE/EF/EED型磁芯尺寸



型号 Type	尺寸 Dimensions (mm)							重量(克/付) W(g/set)
	A	B	C	D	E	F	G	
EE5/3	5.25±0.1	3.8min	1.35±0.1	1.95±0.1	2.0±0.075	2.65±0.075		0.16
EE6/4	6.25±0.15	4.7 ^{+0.3} ₀	1.2±0.15	1.2±0.15	3.3±0.15	4.2±0.15		0.18
EE10/5.5	10.2±0.3	7.6min	2.4±0.15	9.8±0.2	4.3±0.15	5.5±0.15		3.0
EE13/6	13.0±0.3	10.0min	2.7±0.2	6.1±0.2	4.75±0.25	6.2±0.2		2.6
EF16/6	16.1±0.6	11.3min	4.5±0.2	7.2±0.2	3.75±0.15	6.25±0.15		4.8
EF16/6/5	16.1±0.6	11.3 ^{+0.6} ₀	4.7 ⁰ _{-0.3}	4.7±0.2	3.6 ^{+0.3} ₀	6.1 ^{+0.3} ₀		3.2
EE16/7	16.0±0.3	11.7min	4.0±0.2	4.9±0.2	5.3±0.2	7.3±0.2		3.5
EE16/7/12	16.0±0.3	9.0±0.3	7.0±0.2	11.7±0.3	3.5±0.15	6.9±0.1		11
EE16/7/18	16.0±0.3	9.0±0.3	7.0±0.2	17.7±0.3	3.5±0.15	6.9±0.1		16.8
EF16/8	16.1±0.6	11.3min	4.55±0.15	4.5±0.2	6.0±0.2	8.15±0.15		3.8
EE16/12	16.0±0.3	11.7min	4.0±0.2	4.75±0.25	10.25±0.25	12.25±0.2		5.0
EE19/8/5	19.15±0.5	14.2min	4.65±0.25	5.0±0.25	5.7 ^{+0.25} _{-0.15}	8.05±0.25		4.6
EE19/8/5A	19.1±0.3	14.1min	4.85±0.25	4.85±0.25	5.75±0.15	8.0±0.2		4.5
EE19/14	19.0±0.3	13.7min	4.85±0.25	4.85±0.25	11.3±0.3	13.55±0.3		7.4
EE19.5/14	19.5±0.4	14.3min	4.85±0.25	4.85±0.25	11.3±0.3	13.55±0.3		7.3
EF20/9/6	20.15±0.65	14.1min	5.7±0.2	5.65±0.25	6.4±0.2	9.2±0.2		6.7
EF20/9/11	20.15±0.65	14.1min	5.7±0.2	10.75±0.25	6.4±0.2	9.2±0.2		13.2
EF20/10	20.05±0.55	14.1min	5.7±0.2	5.65±0.25	7.05±0.15	9.85±0.15		7.5
EE20/11	20.5±0.7	13.5min	5.0±0.35	7.0±0.3	7.0±0.2	10.7±0.3		10
EE22/9	22.0±0.4	16.0min	5.75±0.25	5.75±0.25	5.65±0.2	9.65±0.25		8
EE22/15	22.0±0.6	16.2min	5.7±0.3	5.7±0.3	11.3±0.2	15.3±0.2		11
EE24/8	24.0±0.5	17.1min	6.55±0.2	7.65±0.2	4.75±0.2	8.0±0.2		10
EE24/11	24.0±0.6	17.1min	6.6±0.3	7.7±0.6	7.8±0.3	11.1±0.3		13

5、EE/EF/EED型磁芯尺寸



型号 Type	尺寸 Dimensions (mm)							重量(克/付) W(g/set)
	A	B	C	D	E	F	G	
EE25/10	25.3±0.5	19.0min	6.25±0.2	6.2±0.25	6.75±0.25	9.9±0.25		9.4
EE25/10B	25.6±0.5	18.8min	6.5±0.2	6.4±0.2	6.65min	9.9±0.25		10.2
EF25/13	25.1±0.8	17.5min	7.25±0.25	7.2±0.3	9.0±0.3	12.6±0.3		15
EE25/16	25.4±0.4	18.7min	6.35±0.3	6.35±0.3	12.7±0.3	15.85±0.3		15
EE26/10/6	25.9±0.4	19.0min	6.5±0.2	6.45±0.25	6.55±0.25	9.9±0.3		10
EE26/10/11	26.1±0.4	18.6min	7.25±0.25	10.7±0.3	6.45±0.15	10.2±0.25		19
EE26.5/17	26.5±0.5	18.5min	7.0±0.3	8.0±0.3	13.5±0.3	17.3±0.3		23
EE27/9	27.25±0.5	18.45min	8.4±0.2	9.75±0.2	4.75±0.2	8.85±0.15		17
EE28/11/10	28.0±0.5	18.6min	7.25±0.25	10.7±0.3	6.3±0.2	10.5±0.3		22
EE28/11/11	28.0±0.75	18.55min	7.7±0.25	11.15±0.25	5.7±0.3	10.5±0.3		23
EE30/14	29.8±0.5	20.9min	8.1±0.2	10.65±0.2	9.9±0.2	13.9±0.2		29
EE30/15	30.0±0.7	19.5min	6.95±0.25	7.05±0.25	10.0±0.3	15.0±0.2		19.4
EE31/13	30.65±0.65	21.8min	9.4±0.25	9.4±0.3	8.75±0.25	13.2±0.2		25
EF32/16	32.1±0.8	22.7min	9.2±0.3	9.15±0.35	11.6±0.3	16.1±0.3		30
EF35/14	35.0±0.5	24.5min	10.0±0.3	9.53±0.25	9.68±0.25	14.43±0.25		32
EE36/22	36.0±0.7	23.3min	10.2±0.5	12.0±0.6	15.75±0.6	21.75±0.4		64
EE40/22	40.0±0.7	26.8min	11.75±0.3	11.75±0.3	15.25±0.3	22.25±0.3		74
EE41/17	41.3±0.8	28.0min	12.7±0.25	12.7±0.25	10.5±0.3	16.85±0.3		69
EE42/21/12	42.15±0.85	29.5min	11.85±0.35	11.85±0.35	15.1±0.3	21.2±0.4		69
EE42/21/15	42.15±0.85	29.5min	11.85±0.35	14.85±0.35	15.1±0.3	21.2±0.4		86
EE42/21/20	42.15±0.85	29.5min	11.85±0.35	19.85±0.35	15.1±0.3	21.2±0.4		115
EE55/28/17	55.15±1.05	37.5min	16.95±0.25	16.75±0.25	18.9±0.4	27.5±0.3		174
EE55/28/21	55.15±1.05	37.5min	16.95±0.25	20.75±0.55	18.9±0.4	27.5±0.3		219
EED28/10	27.9±0.5	20.5min	8.5±0.2	11.9±0.2	6.65±0.2	10.2±0.2	7.2±0.2	23
EED29/15	29.3±0.3	21.6min	8.4±0.2	11.6±0.2	11.0±0.2	14.6±0.2	7.0±0.2	31

5、EE/EF/EED型磁芯尺寸

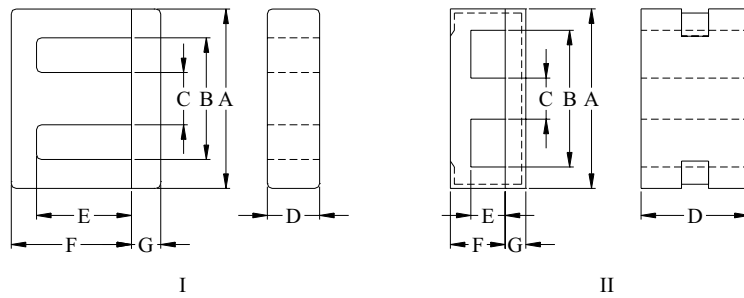
电感因数 A_L -value(nH/N²±25%): 1kHz, 100Ts, 25℃

型号 Type	等效参数 Effective Parameter				A_L		
	$C_1(\text{mm}^{-1})$	le(mm)	Ae(mm ²)	Ve(mm ³)	JP3	JP4A	JH7
EE5/3	4.85	12.6	2.6	32.9		300	
EE6/4	11.5	18.9	1.64	31.1		185	
EE10/5.5	1.14	26.4	23.1	621		1460	
EE13/6	1.84	31.0	16.8	521	900min		
EF16/6	0.873	29.5	33.6	991	2000		
EF16/6/5	1.34	29.5	22.0	649	1300		
EE16/7	1.81	35.5	19.6	695	850min		2000
EE16/7/12	0.335	26.8	79.9	2144		5600	
EE16/7/18	0.218	26.8	123	3298		8000min	
EF16/8	1.89	38.0	20.1	762	1160		
EE16/12	2.91	55.3	19.0	1050	600min		1800
EE19/8/4.8	1.79	39.5	22.1	872	900min		3600
EE19/8/4.9	1.75	39.8	22.7	903	900min		2400
EE19/14	2.64	61.7	23.4	1440	670min	850	2000
EE19.5/14	2.68	62.3	23.2	1445		850	
EF20/9/6	1.35	43.2	32.0	1384	1500		
EF20/9/11	0.709	432	60.9	2634	3125		
EF20/10	1.44	45.8	31.8	1458	1380		
EE20/11	1.12	46.4	41.5	1927	1900		5800
EE22/9	1.17	43.1	37	1590	1600min		
EE22/15	1.93	65.6	34.0	2232	1250		
EE24/8	0.811	40.2	49.6	2000	2090		
EE24/11	1.05	52.5	50.0	2630	2100		

5、EE/EF/EED型磁芯尺寸

电感因数 A_L -value($nH/N^2 \pm 25\%$): 1kHz, 100Ts, 25°C

型号 Type	等效参数 Effective Parameter				A_L			
	$C_1(mm^{-1})$	le(mm)	Ae(mm^2)	Ve(mm^3)	JP3	JP4A	JH7	JH15
EE25/10	1.32	49.9	37.9	1890			4000	
EE25/10B	1.22	49.8	40.7	2026				8300min
EF25/13	1.18	58.1	49.4	2870	2140			
EE25/16	1.83	73.5	40.1	2950			3160	
EE26/10/6	1.19	49.5	41.5	2054	2000		3500	
EE26/10/11	0.640	49.0	76.6	3760	3500			
EE26.5/17	1.36	77.6	57.1	4430		1150		
EE27/9	0.535	42.5	79.5	3382	3700	2900		
EE28/11/10	0.582	49.7	85.4	4240	3900	3100		
EE28/11/11	0.506	48.1	94.9	4560	3000			
EE30/14	0.766	65.6	85.8	5620		3000		
EE30/15	1.13	65.9	58.2	3840		2000		
EE31/13	0.761	61.7	81.1	5000		3060		
EF32/16	0.932	74.7	80.2	5990	2500			
EF35/14	0.747	69.0	92.3	6370	2800			
EE36/22	0.710	94.4	133	12600	2650			
EE40/22	0.664	96.9	146	14100	3810			
EE41/17	0.490	78.0	159	12400	4680	4200		
EE42/21/12	0.698	97.7	140	13700	3700			
EE42/21/15	0.555	97.7	176	17200	4100			
EE42/21/20	0.415	97.8	235	23000	5500			
EE55/28/17	0.440	124	282	34900	5300			
EE55/28/21	0.355	124	349	43200	6600			
EED28/10	0.559	50.3	90.0	4530	4000	3800		
EED29/15	0.769	69.2	90.0	6230	2900	2750		

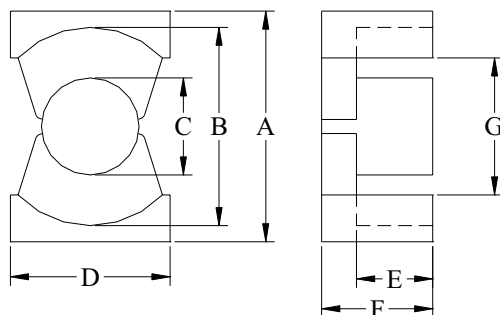


型号 Type	形状 Shape	尺寸 Dimensions (mm)							重量(克/付) W(g/set)
		A	B	C	D	E	F	G	
EI22B	I	22.0±0.6	16.2min	5.7±0.3	5.7±0.3	11.4±0.2	15.4±0.3	4.0±0.2	7
EI25.4	I	25.3±0.5	18.7min	6.35±0.3	6.75±0.3	12.4±0.3	15.6±0.3	3.2±0.3	10
EI26	I	26.5±0.5	18.5min	7.0±0.3	8.0±0.3	13.5±0.3	17.3±0.3	3.75±0.25	15
EI28	I	28.0±0.5	18.6min	7.2±0.3	10.7±0.3	12.5±0.3	17.0±0.3	3.5±0.2	20
EI30	I	30.0±0.6	19.5min	10.7±0.3	10.7±0.3	16.25±0.25	21.25±0.25	5.5±0.3	33
EI33	I	33.0±0.6	23.6min	9.7±0.3	12.7±0.3	19.25±0.3	23.75±0.25	5.0±0.3	40
EI35	I	35.0±0.5	24.5min	10.0±0.3	11.4±0.3	18.35±0.15	24.35±0.15	4.7±0.2	39
EI40	I	40.0±0.7	26.8min	11.65±0.35	11.65±0.35	21.15±0.35	26.8±0.5	6.5±0.3	54
EIF14	II	14.0±0.3	10.7min	3.0±0.2	5.0±0.2	2.0±0.2	3.5±0.15	1.5±0.15	1.2
EIF18	II	18.0±0.4	13.6min	4.0±0.2	10.0±0.25	2.0±0.2	4.0±0.2	2.0±0.15	4
EIF22	II	21.8±0.4	16.4min	5.0±0.25	15.8±0.3	3.2±0.3	5.7±0.3	2.5±0.25	10
EIF32	I	31.75±0.6	24.4min	6.35±0.25	20.32±0.5	3.18±0.4	6.35±0.3	3.18±0.3	23
EIF38	I	38.1±0.7	29.4min	7.6±0.3	25.4±0.5	4.45±0.3	8.26±0.3	3.8±0.3	42
EIF64	I	63.8±1.5	52.3min	10.2±0.3	50.3±1.0	5.1±0.3	10.2±0.3	5.1±0.3	178

6、EI/EIF型磁芯

电感因数 A_L -value($nH/N^2 \pm 25\%$): 1kHz, 100Ts, 25°C

型号 Type	等效参数 Effective Parameter				A_L		
	$C_1(\text{mm}^{-1})$	$l_e(\text{mm})$	$A_e(\text{mm}^2)$	$V_e(\text{mm}^3)$	JP2	JP3	JP4A
EI22B	1.27	43.3	34.0	1471	1800	1750	
EI25.4	1.13	47.6	41.9	1990		2100	
EI26	0.869	50.6	58.2	2940		2200	
EI28	0.585	48.9	83.6	4090	4300	3970	
EI30	0.526	58.1	110.5	6423		4132	
EI33	0.575	67.6	118	7940	5000	3800	
EI35	0.587	67.7	115	7800		3400	
EI40	0.551	77.0	140	10800	6200	4000	
EIF14	1.15	16.7	14.5	242			1300
EIF18	0.514	20.3	39.5	801			3000
EIF22	0.332	26.1	78.5	2050			5000
EIF32	0.271	35.1	130	4560			7000
EIF38	0.224	43.5	194	8450			8600
EIF64	0.136	69.7	511	35700			15000

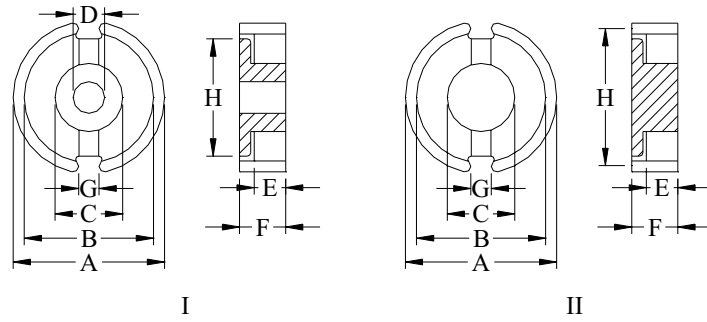


型号 Type	尺寸 Dimensions (mm)							重量(克/付) W(g/set)
	A	B	C	D	E	F	G	
PQ 20/16	20.5±0.4	18.0±0.4	9.0 ⁺⁰ _{-0.4}	14.0±0.4	5.0 ^{+0.3} ₋₀	8.2 ⁺⁰ _{-0.2}	12.0min	13
PQ 20/20	20.5±0.4	18.0±0.4	9.0 ⁺⁰ _{-0.4}	14.0±0.4	7.0 ^{+0.3} ₋₀	10.2 ⁺⁰ _{-0.2}	12.0min	15
PQ 26/20	26.5±0.45	22.5±0.45	12.2 ⁺⁰ _{-0.4}	19.0±0.45	5.6 ^{+0.3} ₋₀	10.2 ⁺⁰ _{-0.25}	15.5min	31
PQ 26/25	26.5±0.45	22.5±0.45	12.2 ⁺⁰ _{-0.5}	19.0±0.45	7.9 ^{+0.3} ₋₀	12.5 ⁺⁰ _{-0.25}	15.5min	36
PQ 32/20	32.0±0.5	27.5±0.5	13.7 ⁺⁰ _{-0.5}	22.0±0.5	5.6 ^{+0.2} ₋₀	10.4 ⁺⁰ _{-0.25}	19.0min	42
PQ 32/30	32.0±0.5	27.5±0.5	13.7 ⁺⁰ _{-0.5}	22.0±0.5	10.5 ^{+0.3} ₋₀	15.3 ⁺⁰ _{-0.25}	19.0min	55
PQ 35/35	35.0±0.5	32.0±0.5	14.6 ⁺⁰ _{-0.5}	26.0±0.5	12.35 ^{+0.3} ₋₀	17.5 ⁺⁰ _{-0.25}	23.5min	73
PQ 40/40	40.0 ^{+1.4} _{-0.4}	37.0±0.6	15.2 ⁺⁰ _{-0.6}	28.0±0.5	14.6 ^{+0.3} ₋₀	20.0 ⁺⁰ _{-0.25}	27.5min	95

电感因数 A_L -value(nH/N²±25%): 1kHz, 100Ts, 25℃

型号 Type	等效参数 Effective Parameter				A_L	
	C_1 (mm ⁻¹)	le(mm)	Ae(mm ²)	Ve(mm ³)	JP3	JP4A
PQ 20/16	0.605	37.4	62.0	2310	3880	
PQ 20/20	0.738	45.4	62.0	2790	3310	2900
PQ 26/20	0.391	46.3	119	5490	6170	
PQ 26/25	0.471	55.5	118	6530	5250	4650
PQ 32/20	0.326	55.5	170	9420	7310	
PQ 32/30	0.464	74.6	161	12000	5140	4500
PQ 35/35	0.448	87.9	196	17300	4860	5000
PQ 40/40	0.580	102	201	20500	4300	

8、罐型磁芯



型号 Type	形状 Shape	尺寸 Dimensions (mm)							
		A	B	C	D	E	F	G	H
G14/8	I	14.4 ⁰ _{-0.9}	11.4 ^{+0.8} ₀	6.2 ⁰ _{-0.6}	2.9 ^{+0.3} ₀	2.8 ^{+0.3} ₀	4.3 ⁰ _{-0.2}	2.3 ^{+1.8} ₀	10.4
		14.3 ⁰ _{-0.5}	11.6 ^{+0.4} ₀	6.0 ⁰ _{-0.6}	3.0 ^{+0.2} ₀	2.8 ^{+0.2} ₀	4.25 ⁰ _{-0.15}	2.3 ^{+1.8} ₀	10.4
G18/11	I	18.6 ⁰ _{-1.2}	14.6 ^{+0.9} ₀	7.8 ⁰ _{-0.6}	2.9 ^{+0.3} ₀	3.6 ^{+0.3} ₀	5.5 ⁰ _{-0.2}	2.7 ^{+1.7} ₀	14.0
		18.4 ⁰ _{-0.8}	14.9 ^{+0.5} ₀	7.6 ⁰ _{-0.3}	3.0 ^{+0.2} ₀	3.6 ^{+0.2} ₀	5.35 ⁰ _{-0.15}	2.7 ^{+1.7} ₀	14.0
G18/11	II	18.6 ⁰ _{-1.2}	14.6 ^{+0.9} ₀	7.8 ⁰ _{-0.6}		3.6 ^{+0.3} ₀	5.5 ⁰ _{-0.2}	5.7	15.5
G22/13	I	22.2 ⁰ _{-1.2}	17.6 ^{+1.2} ₀	9.5 ⁰ _{-0.6}	4.2 ^{+0.5} ₀	4.6 ^{+0.3} ₀	6.9 ⁰ _{-0.2}	3.0 ^{+1.4} ₀	16.5
		22.2 ⁰ _{-0.8}	17.9 ^{+0.6} ₀	9.4 ⁰ _{-0.3}	4.4 ^{+0.3} ₀	4.6 ^{+0.2} ₀	6.8 ⁰ _{-0.2}	3.0 ^{+1.4} ₀	16.5
G22/13	II	22.2 ⁰ _{-1.2}	17.6 ^{+1.2} ₀	9.5 ⁰ _{-0.6}		4.6 ^{+0.3} ₀	6.9 ⁰ _{-0.2}	6.2	19.0
G26/16	I	26.2 ⁰ _{-1.5}	21.0 ^{+1.2} ₀	11.7 ⁰ _{-0.8}	5.2 ^{+0.5} ₀	5.5 ^{+0.4} ₀	8.2 ⁰ _{-0.2}	3.0 ^{+1.4} ₀	20.0
		26.0 ⁰ _{-1.0}	21.2 ^{+0.8} ₀	11.5 ⁰ _{-0.4}	5.4 ^{+0.4} ₀	5.5 ^{+0.2} ₀	8.15 ⁰ _{-0.2}	3.0 ^{+1.4} ₀	20.0
G30/19	I	30.8 ⁰ _{-1.6}	24.6 ^{+1.5} ₀	13.7 ⁰ _{-0.9}	5.2 ^{+0.5} ₀	6.5 ^{+0.4} ₀	9.7 ⁰ _{-0.3}	3.5 ^{+1.8} ₀	23.0
		30.5 ⁰ _{-1.0}	25.0 ^{+0.8} ₀	13.5 ⁰ _{-0.4}	5.4 ^{+0.3} ₀	6.5 ^{+0.2} ₀	9.5 ⁰ _{-0.2}	3.5 ^{+1.8} ₀	23.0
G36/22	I	36.5 ⁰ _{-1.9}	29.5 ^{+1.8} ₀	16.3 ⁰ _{-0.9}	5.2 ^{+0.5} ₀	7.3 ^{+0.4} ₀	11.1 ⁰ _{-0.3}	4.0 ^{+1.6} ₀	27.2
		36.2 ⁰ _{-1.2}	29.9 ^{+1.0} ₀	16.2 ⁰ _{-0.6}	5.4 ^{+0.3} ₀	7.3 ^{+0.2} ₀	11.0 ⁰ _{-0.3}	4.0 ^{+1.6} ₀	27.2

电感因数 A_L -value(nH/N²): 1kHz,100Ts,25℃

型号 Type	形状 Shape	等效参数 Effective Parameter				A_L			重量(克/付) W(g/set)
		C_1 (mm ⁻¹)	le(mm)	Ae(mm ²)	Ve(mm ³)	JP3	JL2	JH7	
G14/8	I	0.800	20.0	25.0	500	2250±25%	1680 min	6000 min	3
G18/11	I	0.587	25.8	43.3	1120	3450±25%	2370 min	7000 min	5.5
G18/11	II	0.587	27.1	46.2	1250	2500 min	2370 min	7000 min	7
G22/13	I	0.482	31.8	63.2	1990	4200±25%	2900 min	8000 min	10
G22/13	II	0.482	33.8	70.0	2367	3000 min	2900 min	8000 min	13.5
G26/16	I	0.40	37.6	93.9	3460	5300±25%		10000 min	20
G30/19	I	0.330	45.0	136	6100	6800 min	4200 min	15000 min	30
G36/22	I	0.260	52.0	202	10600	8900±25%		20000 min	53

9、线号、截面、阻值对照表 (计算变压器、电感导线功耗)

线号、截面、阻值对照表

AWG 线号	公称直径 (mm)	截面积 (mm ²)	20 时阻值 (/cm)	100 时阻值 (/cm)
16	1.29/1.39	1.5207	0.000132	0.000176
17	1.15/1.24	1.2164	0.000166	0.000222
18	1.02/1.11	0.9735	0.000209	0.000280
19	0.91/1.00	0.7794	0.000264	0.000353
20	0.81/0.89	0.6244	0.000333	0.000445
21	0.72/0.80	0.5004	0.000420	0.000561
22	0.64/0.71	0.4013	0.000530	0.000708
23	0.57/0.64	0.3221	0.000668	0.000892
24	0.51/0.57	0.2586	0.000842	0.001125
25	0.45/0.51	0.2078	0.001062	0.001419
26	0.40/0.46	0.1671	0.001339	0.001789
27	0.36/0.41	0.1344	0.001689	0.002256
28	0.32/0.37	0.1083	0.002129	0.002845
29	0.29/0.33	0.0872	0.002685	0.003587
30	0.25/0.30	0.0704	0.003386	0.004523

10、与磁元件相关的小知识

输出滤波电感计算：

$$\text{传统方法：} L = \frac{(V_i - V_o)T_{on}}{\Delta I} \text{ 因变压器计算时已确定 } V_i = \frac{V_o}{D} = \frac{V_o}{\frac{T_{on}}{T_{on} + T_{off}}} = \frac{V_o T_{on} + V_o T_{off}}{T_{on}}$$

$$\text{由此推出：} L = \frac{(V_i - V_o)T_{on}}{\Delta I} = \frac{V_i T_{on} - V_o T_{on}}{\Delta I} = \frac{(V_o T_{on} + V_o T_{off}) - V_o T_{on}}{\Delta I} = \frac{V_o T_{off}}{\Delta I}$$

前者是计算电感电流在 T_{on} 阶段上升即电感储能过程，而后者 $L = \frac{V_o T_{off}}{\Delta I}$ 则是计算电感电流在 T_{off} 阶段下

降即电感释放能量过程，由变压器副边设计与占空比的关系可推出两者相等，而事实上每个周期的储能和释能也必然是相等的，因此电感计算公式可简化为

$$L = \frac{V_o T_{off}}{\Delta I} = \frac{V_o T_{off}}{(0.1 \sim 0.2)I_o} = (5 \sim 10)R_{OMAX} T_{off}$$

式中 5 ~ 10 对应电流脉动成份为 0.2 ~ 0.1 倍的输出电流，此数值可根据具体情况适当调整。 R_{OMAX} 是最大功率输出时的负载电阻， T_{off} 即死去时间。单位：亨（欧秒）

磁芯是否饱和计算： $H = F/l = IN/l$ （单位 A/m 或 Oe， $1A/mm = 4 \text{ Oe}$ ）可计算出实际 H 值。

式中 I 、 N 、 l 分别为电流、匝数和磁路长度。根据 B/H 曲线（标准磁化曲线）可查出对应 H 值时 B 应不接近非线性区域。此计算适合于磁环类完全闭合的磁路。对于 E 型或 PQ 型等开气隙的磁芯可根据 TDK 资料查出对应气隙下的 AL 值，再根据 AL 值对应的安匝(AT)数除以输出电流便得出最大不饱和匝数。

变压器漏感的估算：每匝产生约相当于 1/5 匝电感量的漏感（路东文于 2001 年 10 月口头指教）

电路板上走线电感：电路板上走线 20nH/英寸 (25.4mm)， $di/dt = 200A/us$ （路东文于 2001 年 10 月口头指教）

每一个通孔会增加走线的电感值大约 1 至 3nH（网上：嵌入者之家论坛）

详细计算按下式：

铜箔电感 = $0.2 * L * [\ln(2 * L / (W + H)) + 0.2235 * (W + H) / L + 0.5]$ nH 单位：mm, nH

其中：L-铜箔长度、W-铜箔宽度、H-铜箔厚度

过孔电感 = $5.08 * h * [\ln(4 * h / d) + 1]$ 单位：in, nH, $h = 0.062$

其中：h-过孔的长度、d-中心钻孔的直径

过孔电容 = $1.41 \text{ TD}1 / (D2 - D1)$ 单位：in, pf,

其中：-板基材介电常数（通常取 4.4）、T-PCB 板的厚度、

D1-过孔焊盘的直径、D2-过孔在铺地层上的隔离孔直径

变压器标示的功率：TDK 对每款磁芯标示的功率是指正激变换器的功率，全桥/半桥/推挽等平衡式变换器可出 3 倍于正激的功率。（路东文经验数据于 2001 年 10 月口头指教）

11、电磁学基本概念标示、定义、单位换算及相互关系)

电磁学基本概念标示、定义、单位换算及相互关系

概念	单位			相互关系
	国际单位制 (SI)	高斯单位制 (CGS)	换算关系	
磁感应强度 (磁通密度)	T (特斯拉)	Gs (高斯)	1T=10 ⁴ Gs	$\phi = BA$ (A 为截面积) 1Wb=1T × 1m ² 1Mx=1Gs × 1cm ²
磁通	Wb (韦伯)	Mx (麦克斯韦)	1Wb=10 ⁸ Mx	$\psi = N \phi$
磁链	Wb (韦伯)	Mx (麦克斯韦)	1Wb=1Vs (1 韦伯=1 伏秒)	$e = -d \psi / dt$
感应电动势	V (伏)	静电伏特	1V=1/300startvol	
介质磁导率	H/m (亨/米)	Gs/Oe (高/奥)	H/m=10 ⁷ Gs/4 π Oe	
真空磁导率	H/m (亨/米)	Gs/Oe (高/奥)	真空磁导率为: 1Gs/Oe	
相对磁导率	—	—	相对单位的倍数 关系: $\mu_r = \mu / \mu_0$	
磁场强度	A/m (安/米)	Oe (奥斯特)	1A/m=0.4 π × 10 ⁻³ Oe 1A/cm=0.4 π Oe	$F = IN$ $F = \phi R_m$ $F = HI$ l: 磁路长度
磁势 (磁动势)	AT (安匝)	静电单位/秒	1A=3 × 10 ⁹ esu/s	磁场体积 V=A1 $W_m = BHV/2$ $W_e = LI^2/2$ L=ψ / i $e = -d \psi / dt$ $e = -L di / dt$
磁能量	J (焦耳)	Erg (尔格)	1J=1 × 10 ⁷ Erg	
电感量	H 或 Ω·s 亨利或欧秒	s ² /cm 平方秒/厘米	1H=1.113 × 10 ⁻¹² s ² /cm	