

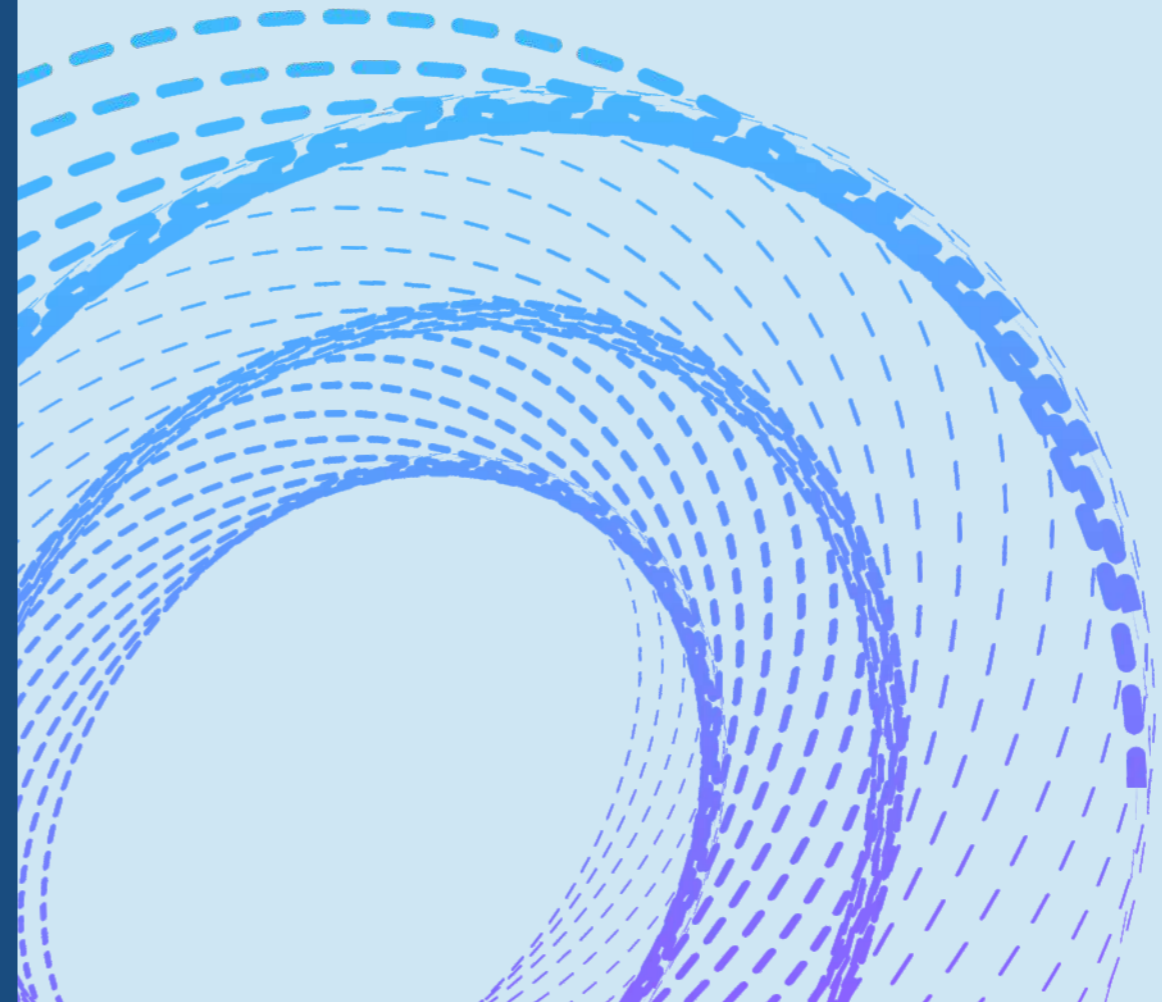


东睦科达 NBTM KEDA MAGNETIC POWDER CORES

Sendust Plus Cores / KPH
High Flux Plus Cores / KH-H
Sendust Cores / KS

Si-Fe[®] Cores / KSF
High Flux Cores / KH
MPP Cores / KM

Super Sendust Cores / KS-HF
Neu Flux[®] Cores / KNF
Nanodust[®] Cores / KAM



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Issue N 2022

OUR COMPANY 我们的公司



浙江东睦科达磁电有限公司（KDM）创建于2000年，现为东睦新材料集团股份有限公司（股票代码：600114）的全资子公司。东睦科达是全球屈指可数覆盖从铁粉芯到高性能铁镍磁粉芯等全系列金属磁粉芯的行业领先厂商。公司产品广泛应用于高效率开关电源，不间断电源，光伏逆变器，新能源汽车，充电桩，高端家用电器，电能质量，5G通信等领域。

自2002年以来，东睦科达先后通过ISO9001:2015，ISO14001:2015和IATF16949:2016管理体系认证。通过多年的不断发展，公司具备先进的软磁金属磁粉芯自动化生产线和专业磁材料研发体系，将始终以最高的质量标准为客户提供优质的服务和先进的产品解决方案。

MAIN APPLICATION FIELDS 主要应用领域



光伏
PV



新能源汽车
NEV



不间断电源
UPS



充电桩
Charging Pile



服务器电源
Server Power



5G通信
5G Communication

Founded in 2000, Zhejiang NBTM KeDa Magnetoelectricity Co., Ltd. (KDM) now is a wholly-owned subsidiary of NBTM New Material Group Co., Ltd. (Stock Code: 600114). KDM is one of the world's leading manufacturers covering a full range of magnetic powder cores, from iron powder cores to high-performance iron-nickel magnetic powder cores. Our products are widely used in high-efficiency switching mode power supply, uninterruptible power supply, photovoltaic inverter, new energy vehicle, charging pile, high-end household appliances, power quality, 5G communication and other fields.

Since 2002, we have got the certifications of ISO9001:2015, ISO14001:2015 and IATF 16949:2016. With years of sustainable development, equipped with advanced automatic manufacturing facilities and R&D center, KDM is dedicated to providing competitive products with the highest quality.

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Neu Flux® Cores / KNF038-045

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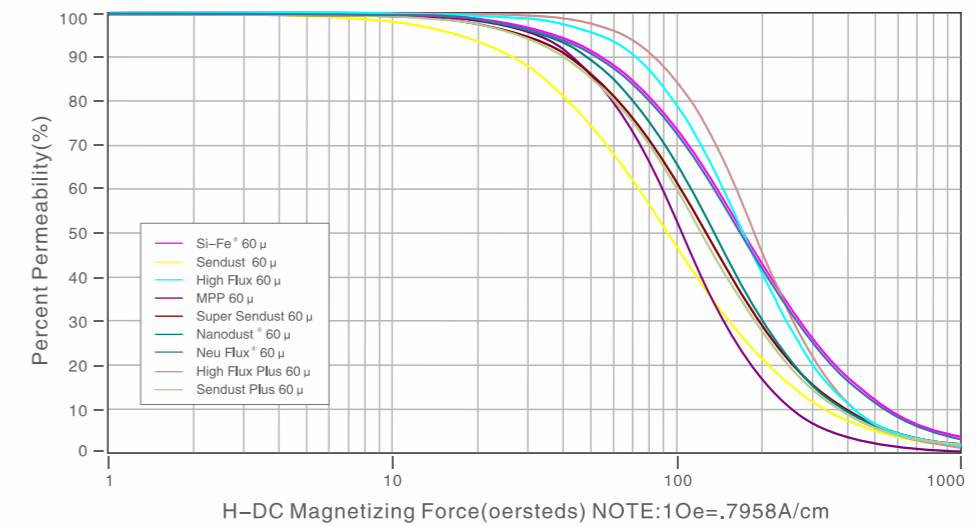
基本资料 General Information

一般性能对照表 General Information

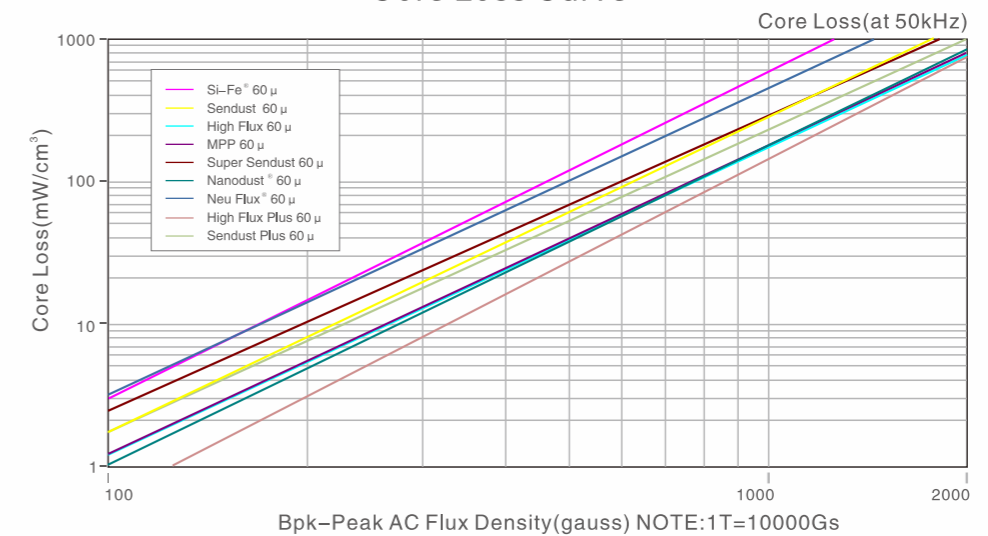
Core Materials	Core Loss	Perm.vs DC Bias	Frequency Range	Curie Temp.	Flux Density (Sat.)	Temp. Stability
Sendust Plus	Low	Better	1MHz	500°C	12,000G	Best
High Flux Plus	Low	Best	1MHz	600°C	15,000G	Best
Sendust	Low	Good	2MHz	600°C	10,500G	Good
Si-Fe®	Medium	Best	1MHz	700°C	16,000G	Best
High Flux	Low	Best	1MHz	500°C	15,000G	Best
MPP	Lowest	Good	1MHz	400°C	7,500G	Best
Super Sendust	Low	Better	1MHz	650°C	12,000G	Good
Neu Flux®	Low	Best	1MHz	650°C	16,000G	Better
Nanodust® -KAM	Lowest	Better	1MHz	550°C	13,000G	Better
Iron Powder Cores	High	Good	2MHz	750°C	12,000G	Good
*Amorphous Powder Cores	Low	Better	1MHz	400°C	14,000G	Poor
*Ferrite(gapped)	Lowest	Poor	1MHz	200°C	4,500G	Poor

※每种测试材料均采用相同的磁导率60μ。All test results are based on permeability of 60μ。
 ※Amorphous Powder Cores和Ferrite我公司未生产，仅供参考。Amorphous Powder Cores and Ferrite are not available in KDM, above related data is for reference only.

Percent Change of Permeability vs.DC Magnetizing Force



Core Loss Curve



新材料

New Materials

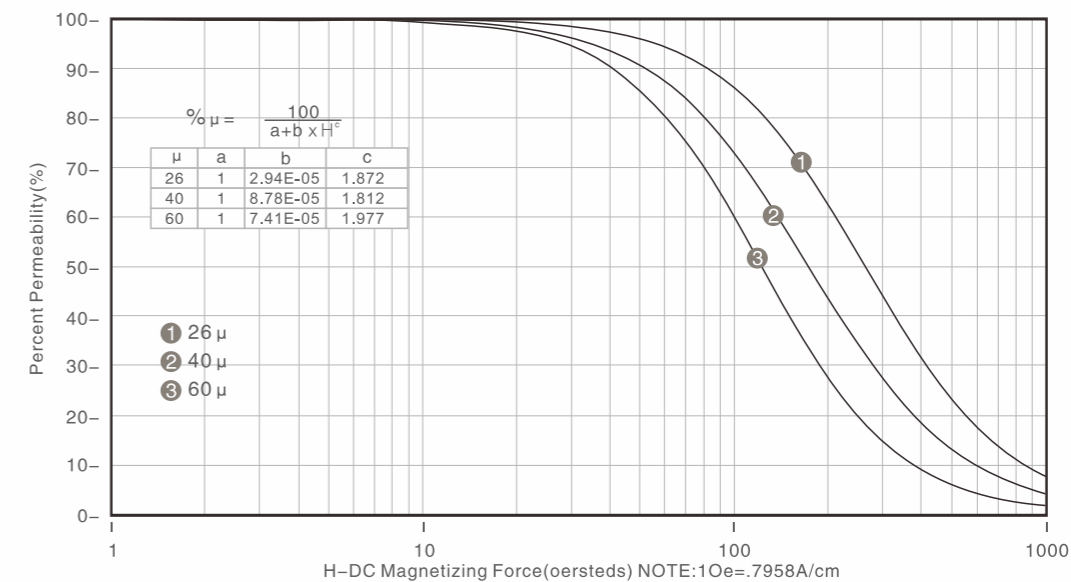
Sendust Plus Cores / KPH

High Flux Plus Cores / KH-H

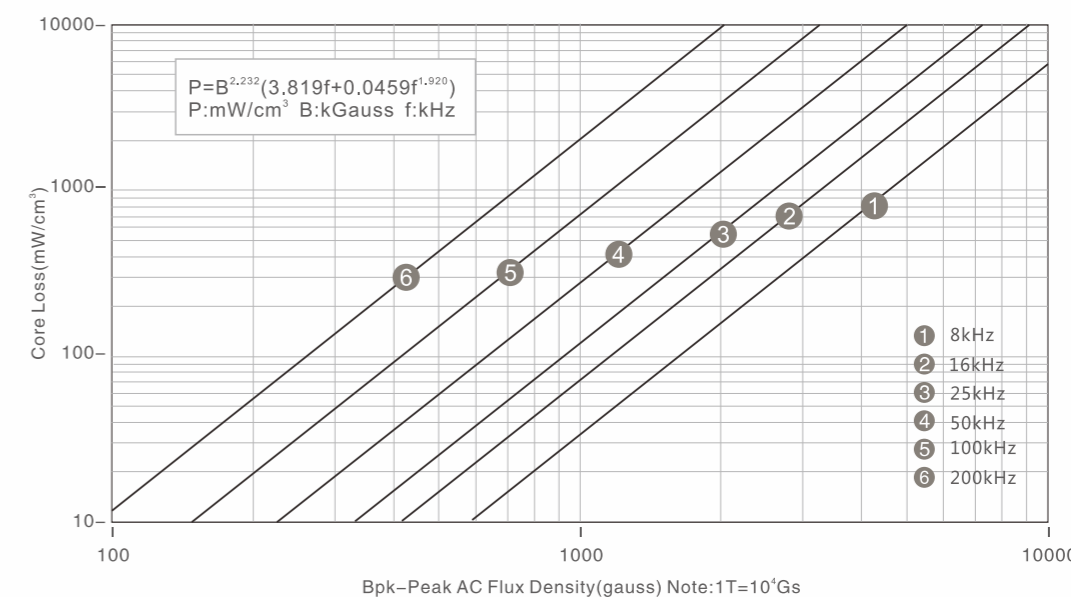




Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



Typical Core Loss Curves (26 μ , 40 μ)
典型磁粉芯损耗曲线 (26 μ , 40 μ)



01 二代超级铁硅铝磁粉芯

Sendust Plus Cores (KPH)

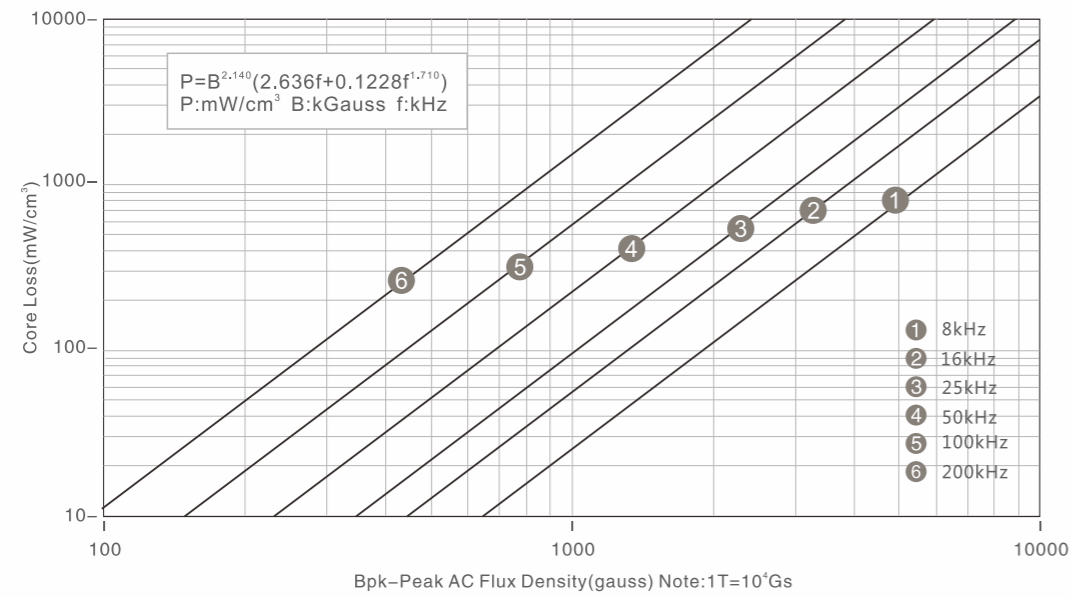
主要特征 MAIN FEATURES

- 比超级铁硅铝更低的损耗 Lower Core Losses than Super Sendust Cores
- 良好的直流偏置能力 Good DC-bias Characteristics
- 稳定的温度及频率特性 Good Temperature Stability and Frequency Characteristics

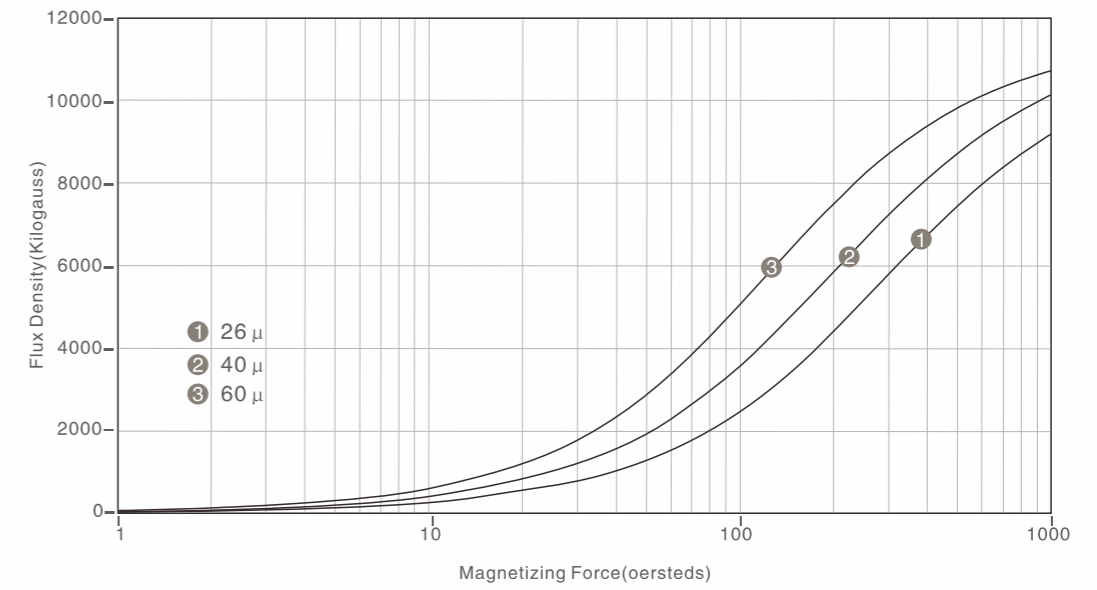
主要应用 MAIN APPLICATIONS

- 充电桩 Charging Pile
- 光伏逆变器 PV Inverter
- 不间断电源 Uninterruptible Power Supply

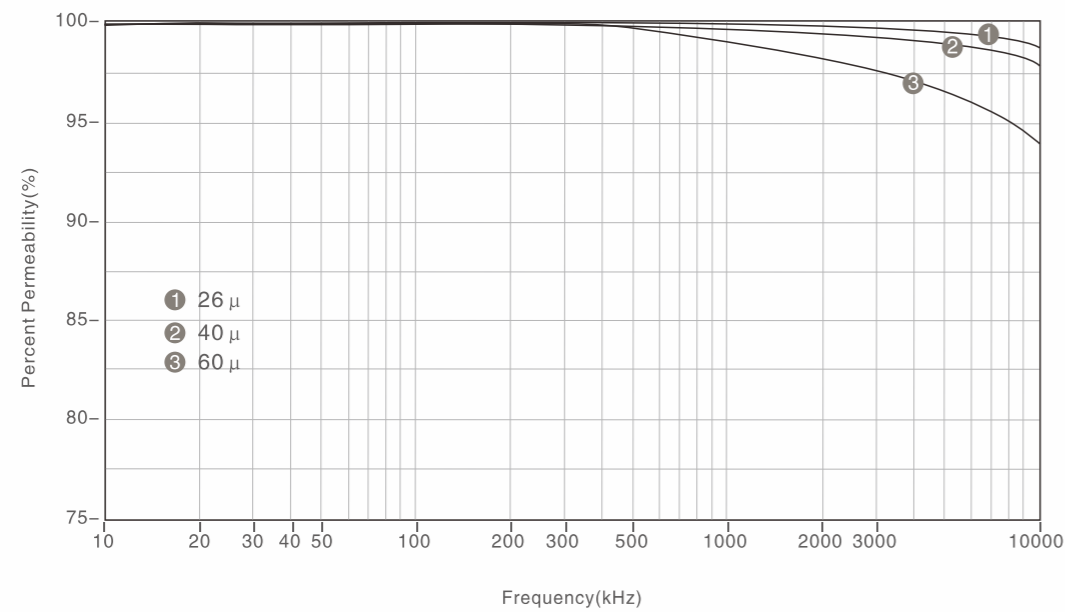
● Typical Core Loss Curves(60 μ)
典型磁粉芯损耗值曲线(60 μ)



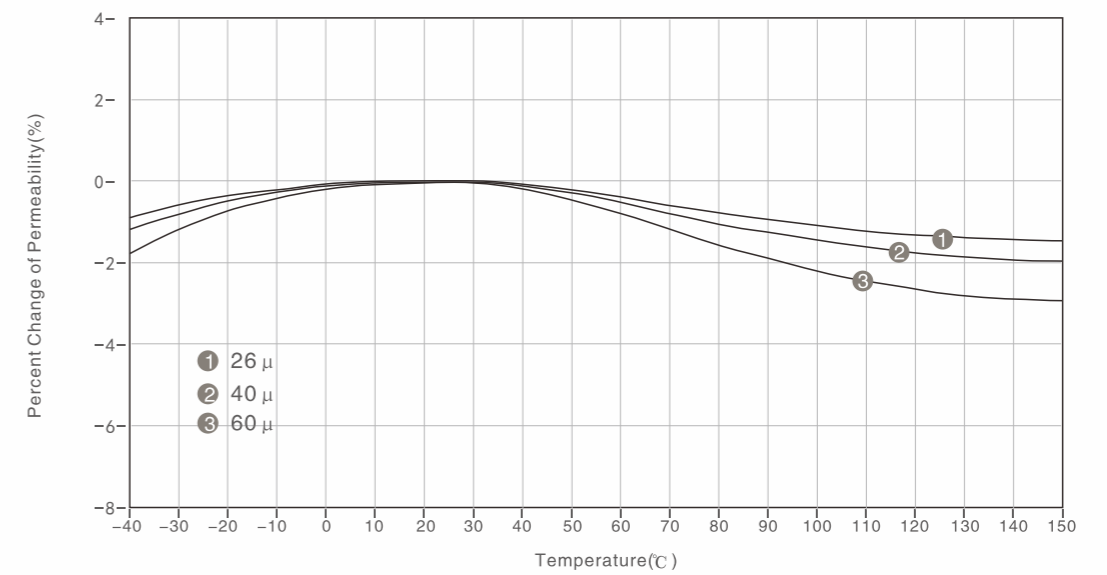
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● Permeability vs. Frequency
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● Temperature Stability
磁导率百分率与温度关系曲线

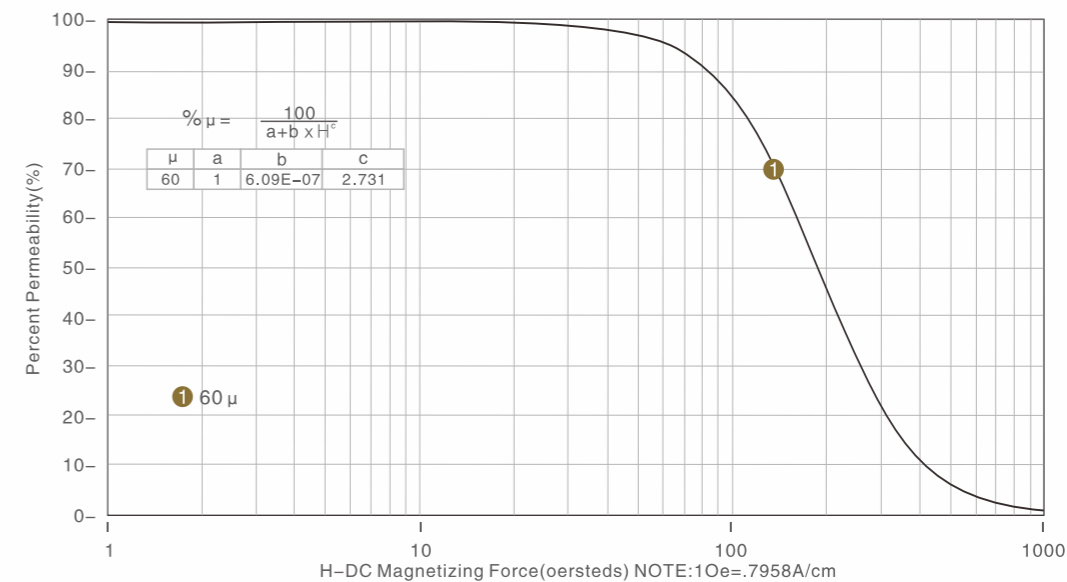


Part Number	Perm. (μ)	AL $\pm 8\%$	ℓ_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KPH050-026A	26	12						
KPH050-040A	40	18	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KPH050-060A	60	27						
KPH065-026A	26	15						
KPH065-040A	40	23	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KPH065-060A	60	35						
KPH068-026A	26	19						
KPH068-040A	40	28	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KPH068-060A	60	43						
KPH080-026A	26	14						
KPH080-040A	40	21	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KPH080-060A	60	32						
KPH090-026A	26	19						
KPH090-040A	40	28	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KPH090-060A	60	43						
KPH092-026A	26	22						
KPH092-040A	40	34	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KPH092-060A	60	51						
KPH106-026A	26	32						
KPH106-040A	40	50	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KPH106-060A	60	75						
KPH107-026A	26	22						
KPH107-040A	40	39	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KPH107-060A	60	59						
KPH130-026A	26	28						
KPH130-040A	40	40	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KPH130-060A	60	61						
KPH131-026A	26	22						
KPH131-040A	40	34	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KPH131-060A	60	51						
KPH132-026A	26	28						
KPH132-040A	40	43	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KPH132-060A	60	65						
KPH135-026A	26	16						
KPH135-040A	40	25	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KPH135-060A	60	38						
KPH141-026A	26	24						
KPH141-040A	40	37	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KPH141-060A	60	56						

Part Number	Perm. (μ)	AL $\pm 8\%$	ℓ_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KPH157-026A	26	35						
KPH157-040A	40	54	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KPH157-060A	60	81						
KPH158-026A	26	53						
KPH158-040A	40	81	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KPH158-060A	60	122						
KPH168-026A	26	47						
KPH168-040A	40	72	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16
KPH168-060A	60	108						
KPH184-026A	26	59						
KPH184-040A	40	90	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KPH184-060A	60	135						
KPH185-026A	26	37						
KPH185-040A	40	57	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KPH185-060A	60	86						
KPH200-026A	26	32						
KPH200-040A	40	48	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KPH200-060A	60	73						
KPH225-026A	26	33						
KPH225-040A	40	50	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KPH225-060A	60	75						
KPH226-026A	26	60						
KPH226-040A	40	92	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KPH226-060A	60	138						
KPH250-026A	26	83						
KPH250-040A	40	128	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KPH250-060A	60	192						
KPH268-026A	26	62						
KPH268-040A	40	95	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KPH268-060A	60	143						
KPH300-026A	26	30						
KPH300-040A	40	45	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KPH300-060A	60	68						
KPH301-026A	26	37						
KPH301-040A	40	56	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KPH301-060A	60	85						
KPH400-026A	26	48						
KPH400-040A	40	74	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KPH400-060A	60	112						



○ Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



02 二代低损耗铁镍磁粉芯

High Flux Plus Cores (KH-H)

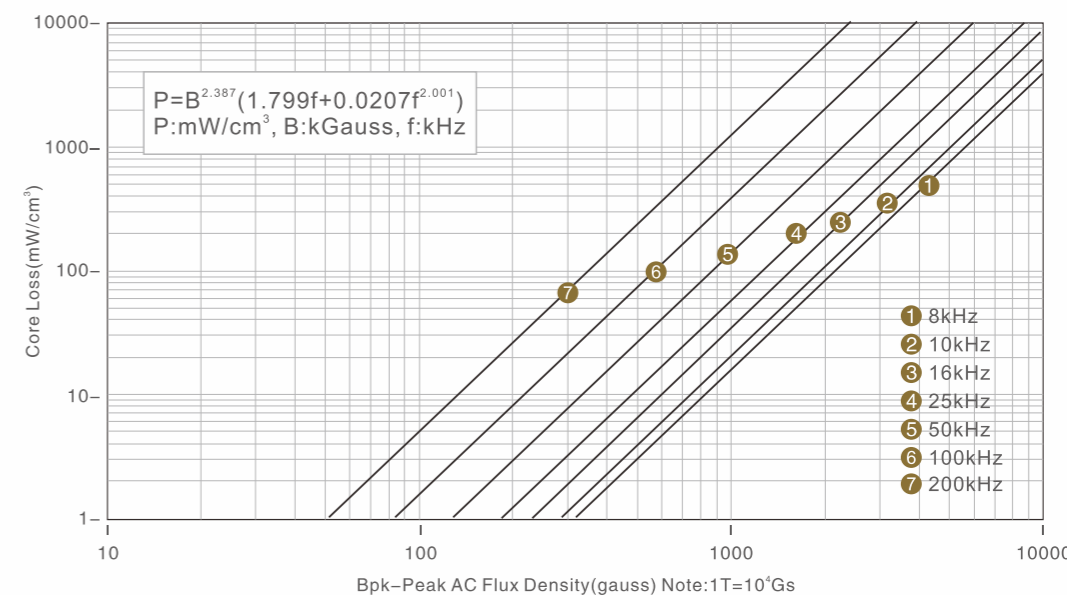
主要特征 MAIN FEATURES

- 比普通铁镍磁芯更低的损耗 Lower Core Losses than High Flux Cores
- 高直流偏置能力(%85 μ 0 @ 100Oe) Good DC-bias Characteristics (%85 μ 0 @ 100Oe)
- 高效率和高功率密度的最佳材料 The Best Material for High Efficiency and High Power Density

主要应用 MAIN APPLICATIONS

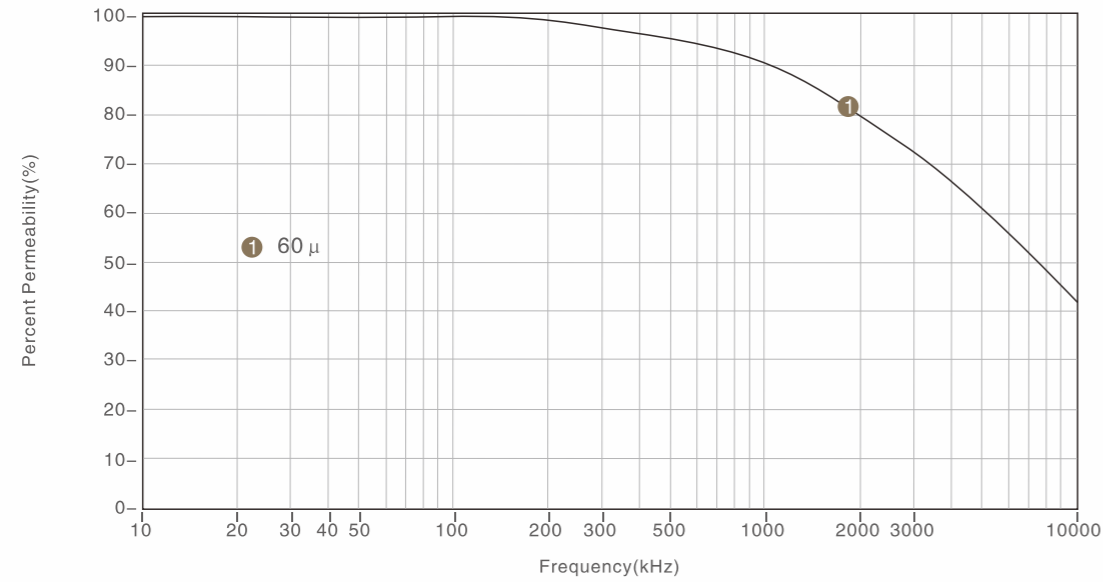
- 服务器电源 Sever Power Supply
- 通信电源 Communication Power Supply
- 新能源汽车车载充电机 Automotive OBC
- DC/DC 变换器 DC/DC Converter

○ Typical Core Loss Curves(60 μ)
典型磁粉芯损耗曲线(60 μ)



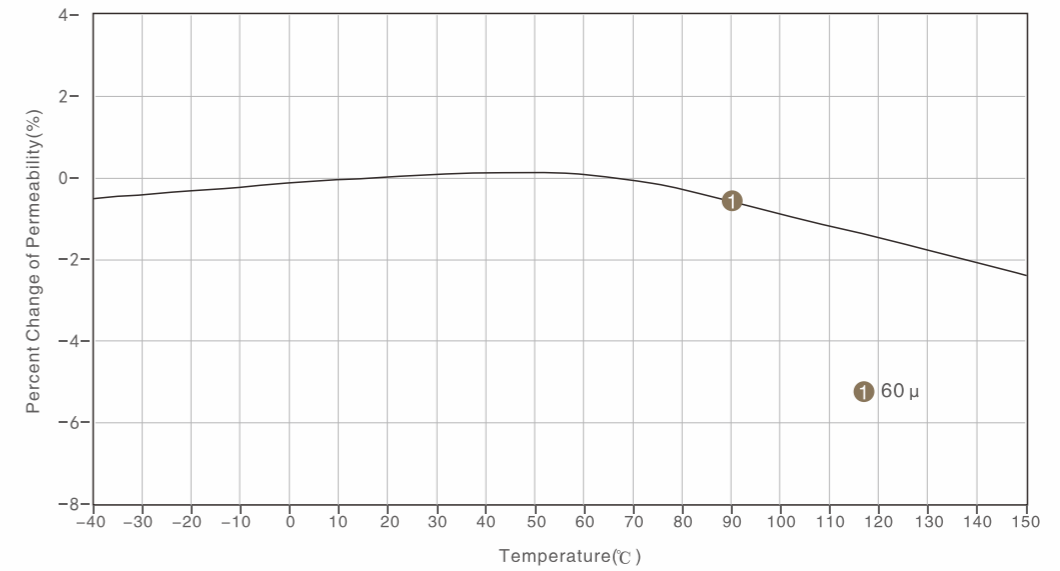
● Permeability vs. Frequency

磁导率与频率关系曲线



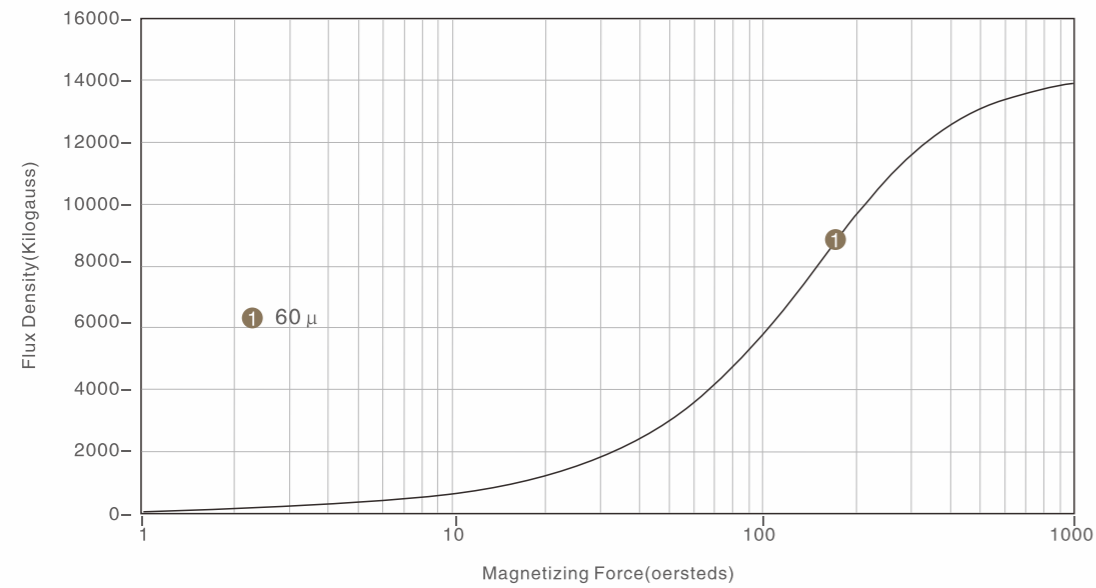
● Temperature Stability

磁导率百分率与温度关系曲线



● Normal Magnetization Curves

标准磁化曲线



Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max)×ID (min)×HT (max)	
							Before Coating	After Coating
KH050-060A-H	60	27	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KH065-060A-H	60	35	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KH068-060A-H	60	43	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KH080-060A-H	60	32	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KH090-060A-H	60	43	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KH092-060A-H	60	51	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KH106-060A-H	60	75	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KH107-060A-H	60	59	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KH130-060A-H	60	61	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KH131-060A-H	60	51	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KH132-060A-H	60	65	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KH135-060A-H	60	38	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KH141-060A-H	60	56	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KH157-060A-H	60	81	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KH158-060A-H	60	122	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KH168-060A-H	60	108	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max)×ID (min)×HT (max)	
							Before Coating	After Coating
KH184-060A-H	60	135	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KH185-060A-H	60	86	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KH200-060A-H	60	73	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KH225-060A-H	60	75	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KH226-060A-H	60	138	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KH250-060A-H	60	192	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KH268-060A-H	60	143	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KH300-060A-H	60	68	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KH301-060A-H	60	85	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KH400-060A-H	60	112	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78

环型磁粉芯

Standard Toroidal Cores

Nanodust[®] Cores / KAM

Super Sendust Cores / KS-HF

Neu Flux[®] Cores / KNF

Sendust Cores / KS

Si-Fe[®] Cores / KSF

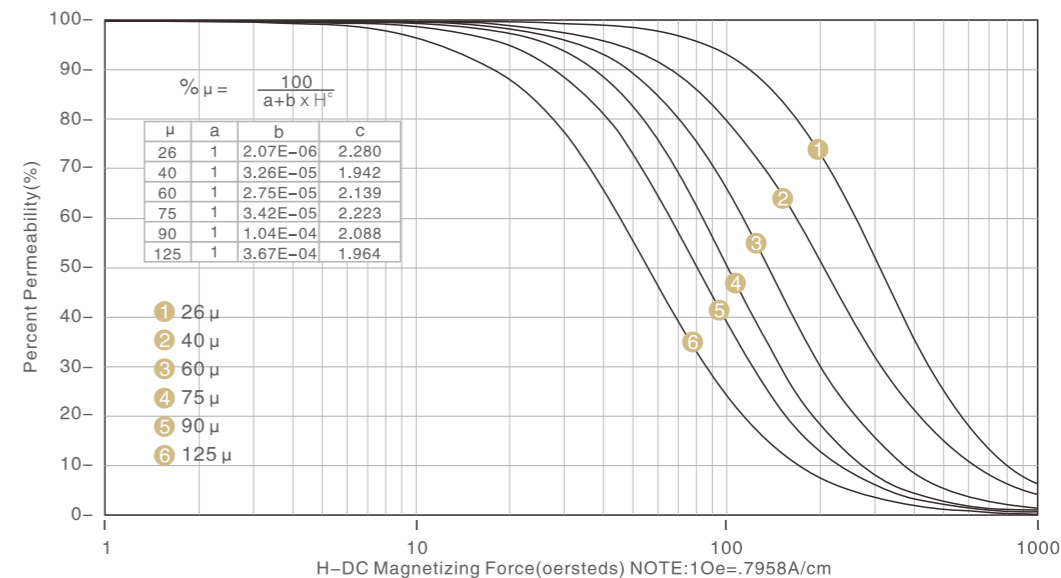
High Flux Cores / KH

MPP Cores / KM





● Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



03 纳米复合磁粉芯 Nanodust® Cores (KAM)

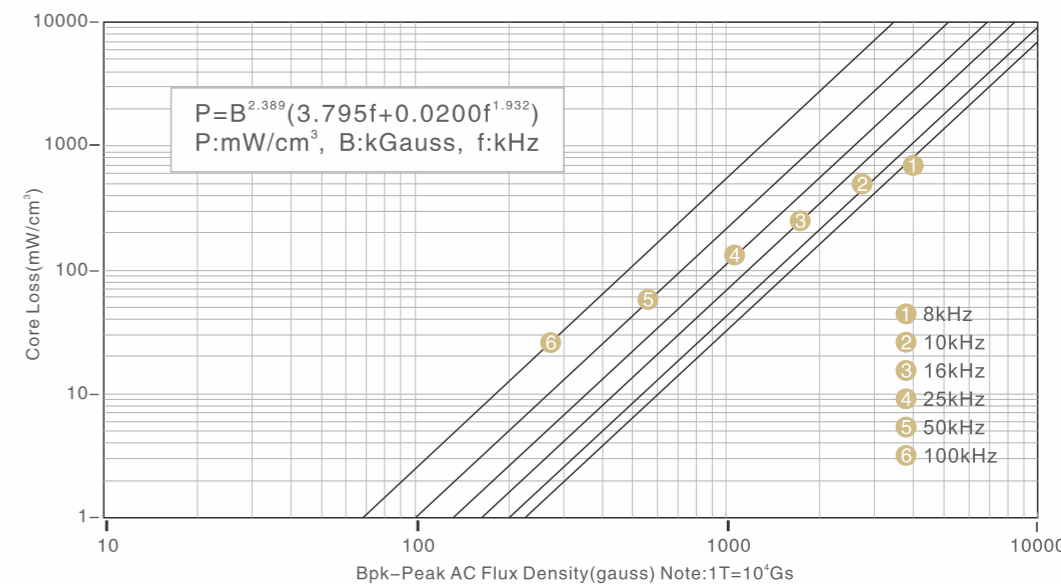
主要特征 MAIN FEATURES

- 高饱和磁通密度 (13000高斯) High Saturation Flux Density (13,000 Gauss)
- 良好的DC偏置能力 Good DC-bias Characteristics
- 无噪音 No Audible Noise
- 磁芯损耗与铁镍钼磁粉芯接近 Core Losses are Closer to MPP Cores

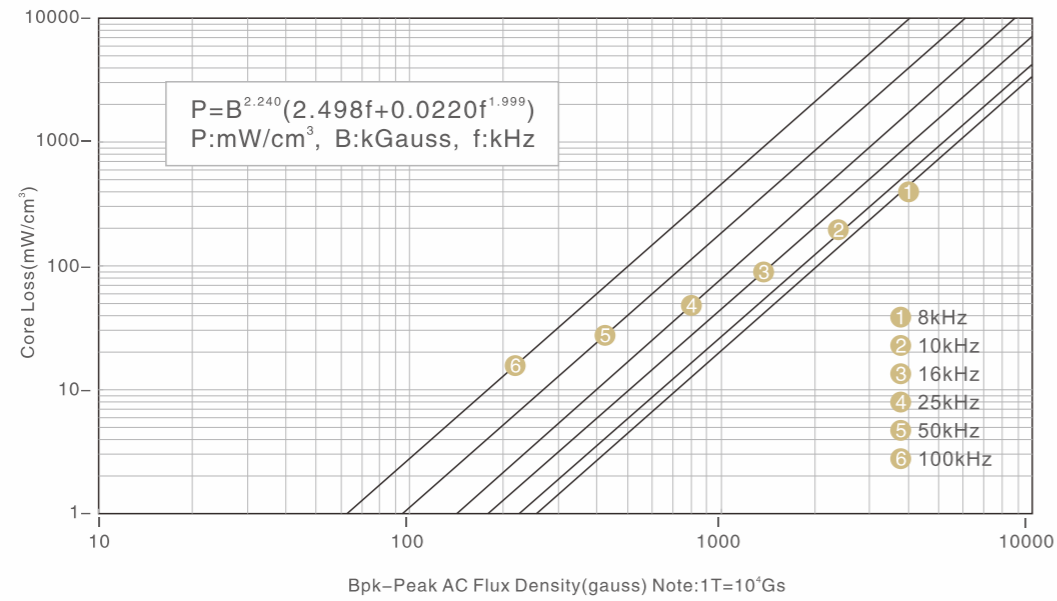
主要应用 MAIN APPLICATIONS

- 高效率服务器电源 High Efficiency Server Power Supply
- 通信电源 Communication Power Supply
- 新能源汽车车载充电机 Automotive OBC

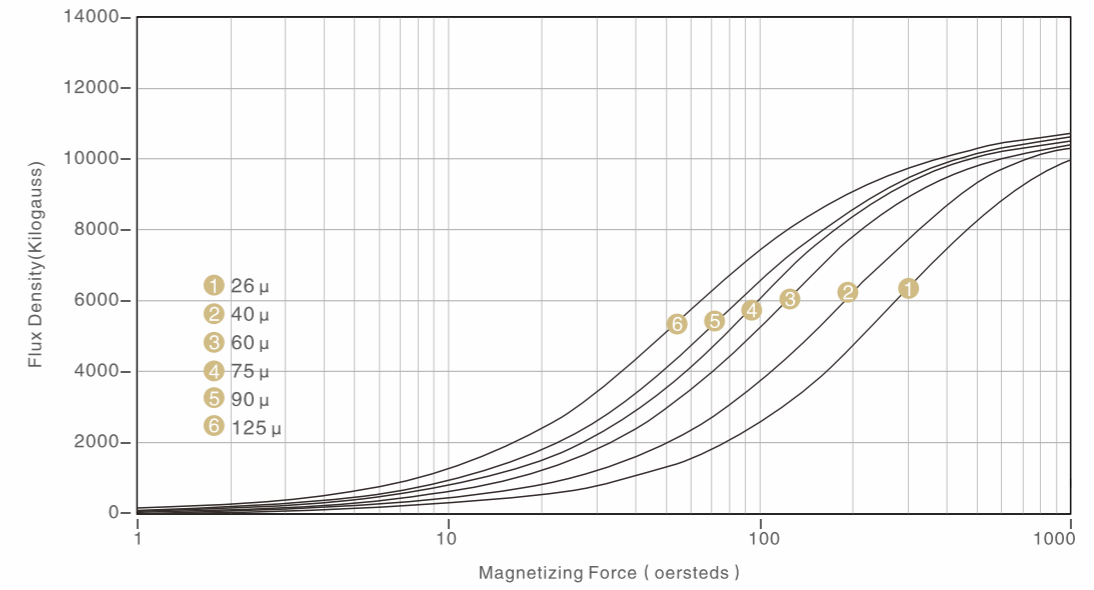
● Typical Core Loss Curves(26 μ , 40 μ)
典型磁粉芯损耗曲线(26 μ , 40 μ)



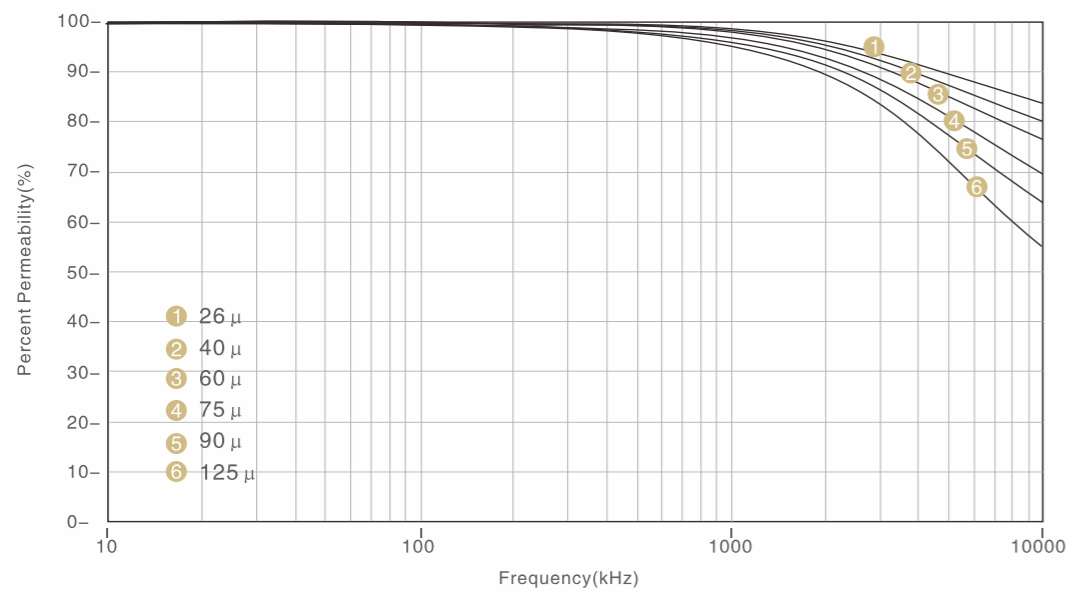
● Typical Core Loss Curves(60 μ ,75 μ ,90 μ ,125 μ)
典型磁粉芯损耗值曲线(60 μ ,75 μ ,90 μ ,125 μ)



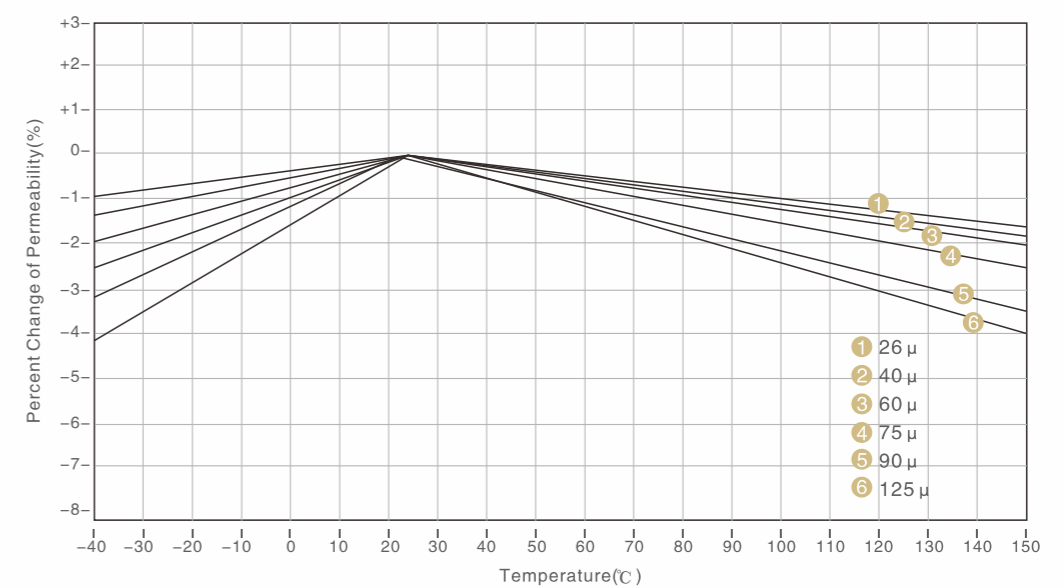
● Normal Magnetization Curves
标准磁化曲线



● Permeability vs. Frequency
磁导率与频率关系曲线



● Temperature Stability
磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KAM050-026A	26	12	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70 × 7.62 × 4.75	13.46 × 6.99 × 5.51
KAM050-060A	60	27						
KAM050-075A	75	34						
KAM050-090A	90	40						
KAM050-125A	125	56						
KAM065-026A	26	15	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50 × 10.20 × 6.35	17.40 × 9.53 × 7.11
KAM065-060A	60	35						
KAM065-075A	75	43						
KAM065-090A	90	52						
KAM065-125A	125	72						
KAM068-026A	26	19	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30 × 9.65 × 6.35	18.03 × 9.02 × 7.11
KAM068-060A	60	43						
KAM068-075A	75	53						
KAM068-090A	90	64						
KAM068-125A	125	89						
KAM080-026A	26	14	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30 × 12.70 × 6.35	21.10 × 12.07 × 7.11
KAM080-060A	60	32						
KAM080-075A	75	41						
KAM080-090A	90	49						
KAM080-125A	125	68						
KAM090-026A	26	19	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90 × 14.07 × 7.62	23.62 × 13.39 × 8.38
KAM090-060A	60	43						
KAM090-075A	75	54						
KAM090-090A	90	65						
KAM090-125A	125	90						
KAM092-026A	26	22	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60 × 14.40 × 8.89	24.30 × 13.77 × 9.70
KAM092-060A	60	51						
KAM092-075A	75	63						
KAM092-090A	90	76						
KAM092-125A	125	105						
KAM106-026A	26	32	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90 × 14.70 × 11.20	27.70 × 14.10 × 11.99
KAM106-060A	60	75						
KAM106-075A	75	94						
KAM106-090A	90	113						
KAM106-125A	125	157						
KAM107-026A	26	22	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90 × 14.70 × 8.64	27.70 × 14.10 × 9.45
KAM107-060A	60	59						
KAM107-075A	75	74						
KAM107-090A	90	89						
KAM107-125A	125	123						

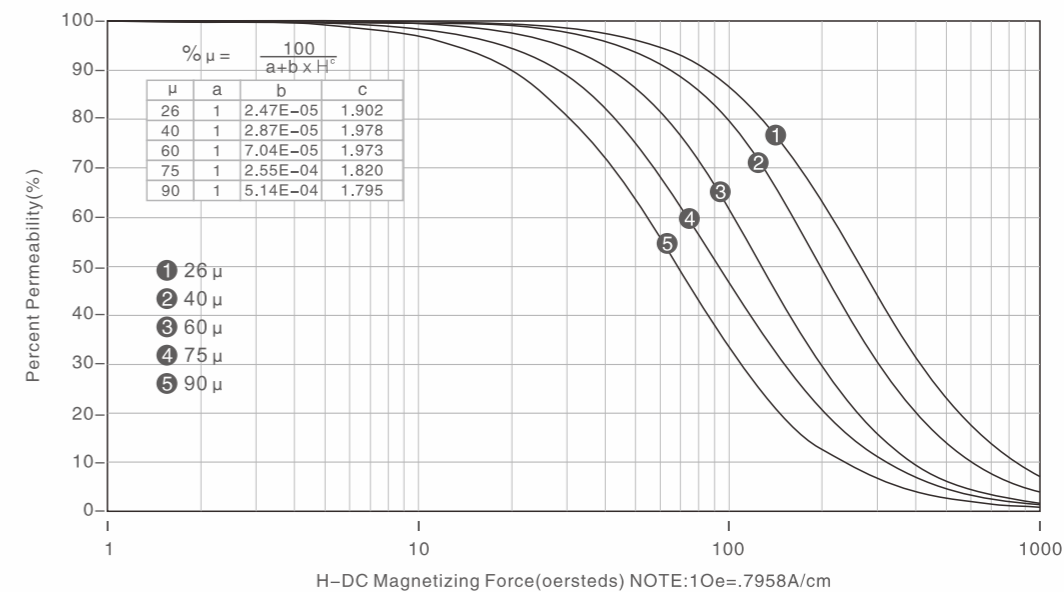
Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KAM130-026A	26	28	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00 × 19.90 × 10.70	33.83 × 19.30 × 11.61
KAM130-060A	60	61						
KAM130-075A	75	76						
KAM130-090A	90	91						
KAM130-125A	125	127						
KAM131-026A	26	22	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00 × 19.90 × 8.76	33.83 × 19.30 × 9.70
KAM131-060A	60	51						
KAM131-075A	75	64						
KAM131-090A	90	76.5						
KAM131-125A	125	109						
KAM132-026A	26	28	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00 × 19.90 × 11.18	33.83 × 19.30 × 11.99
KAM132-060A	60	65						
KAM132-075A	75	81						
KAM132-090A	90	97						
KAM132-125A	125	135						
KAM135-026A	26	16	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30 × 23.40 × 8.89	35.10 × 22.56 × 9.83
KAM135-060A	60	38						
KAM135-075A	75	47						
KAM135-090A	90	57						
KAM135-125A	125	79						
KAM141-026A	26	24	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80 × 22.40 × 10.50	36.63 × 21.54 × 11.28
KAM141-060A	60	56						
KAM141-075A	75	70						
KAM141-090A	90	84						
KAM141-125A	125	117						
KAM157-026A	26	35	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90 × 24.10 × 14.50	40.72 × 23.30 × 15.37
KAM157-060A	60	81						
KAM157-075A	75	101						
KAM157-090A	90	121						
KAM157-125A	125	168						
KAM158-026A	26	53	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13 × 22.08 × 17.00	40.94 × 21.27 × 17.89
KAM158-060A	60	122						
KAM158-075A	75	152						
KAM158-090A	90	183						
KAM158-125A	125	254						
KAM168-026A	26	47	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90 × 24.20 × 16.26	44.00 × 23.30 × 17.16
KAM168-060A	60	108						
KAM168-075A	75	135						
KAM168-090A	90	161						
KAM168-125A	125	224						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KAM184-026A	26	59	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KAM184-060A	60	135						
KAM184-075A	75	169						
KAM184-090A	90	202						
KAM184-125A	125	281						
KAM185-026A	26	37	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KAM185-060A	60	86						
KAM185-075A	75	107						
KAM185-090A	90	128						
KAM185-125A	125	178						
KAM200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KAM200-060A	60	73						
KAM200-075A	75	91						
KAM200-090A	90	109						
KAM200-125A	125	152						
KAM225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KAM225-060A	60	75						
KAM225-075A	75	94						
KAM225-090A	90	112						
KAM225-125A	125	156						
KAM226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KAM226-060A	60	138						
KAM226-075A	75	175						
KAM226-090A	90	207						
KAM226-125A	125	287						
KAM250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KAM250-060A	60	192						
KAM250-075A	75	240						
KAM250-090A	90	288						
KAM250-125A	125	400						
KAM268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KAM268-060A	60	143						
KAM268-075A	75	179						
KAM268-090A	90	215						
KAM268-125A	125	298						
KAM290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KAM290-060A	60	206						
KAM290-075A	75	257						
KAM290-090A	90	309						
KAM290-125A	125	429						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KAM300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KAM300-060A	60	68						
KAM300-075A	75	85						
KAM300-090A	90	102						
KAM300-125A	125	142						
KAM301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KAM301-060A	60	85						
KAM301-075A	75	107						
KAM301-090A	90	128						
KAM301-125A	125	178						
KAM400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KAM400-060A	60	112						
KAM400-075A	75	137						
KAM400-090A	90	164						
KAM400-125A	125	228						
KAM401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KAM401-060A	60	92						
KAM401-075A	75	115						
KAM401-090A	90	139						
KAM401-125A	125	192						
KAM520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KAM520-060A	60	124						
KAM520-075A	75	155						
KAM520-090A	90	187						
KAM520-125A	125	259						
KAM521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KAM521-060A	60	156						
KAM521-075A	75	195						
KAM521-090A	90	234						
KAM521-125A	125	325						
KAM650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KAM650-060A	60	368						
KAM651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KAM651-060A	60	180						



Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



04 超级铁硅铝磁粉芯

Super Sendust Cores (KS-HF)

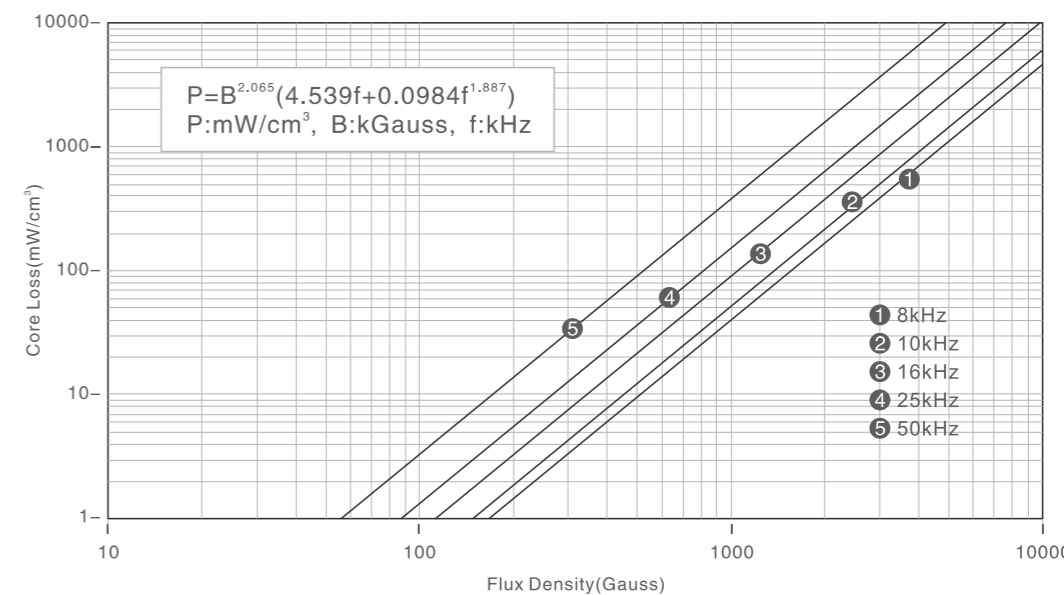
主要特征 MAIN FEATURES

- 良好的DC偏置能力 Good DC-bias Characteristics
- 高饱和磁通密度 (12000高斯) High Saturation Flux Density (12,000 Gauss)
- 较低的磁芯损耗 Low Core Losses

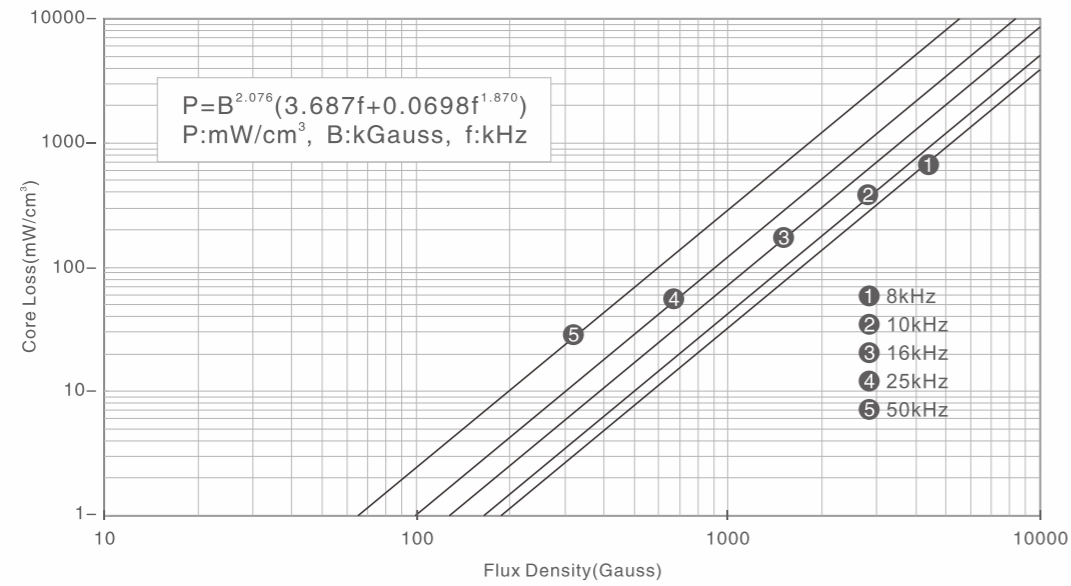
主要应用 MAIN APPLICATIONS

- 工业电源 Industrial Power
- 光伏逆变器 PV Inverter
- 不间断电源 Uninterruptible Power Supply

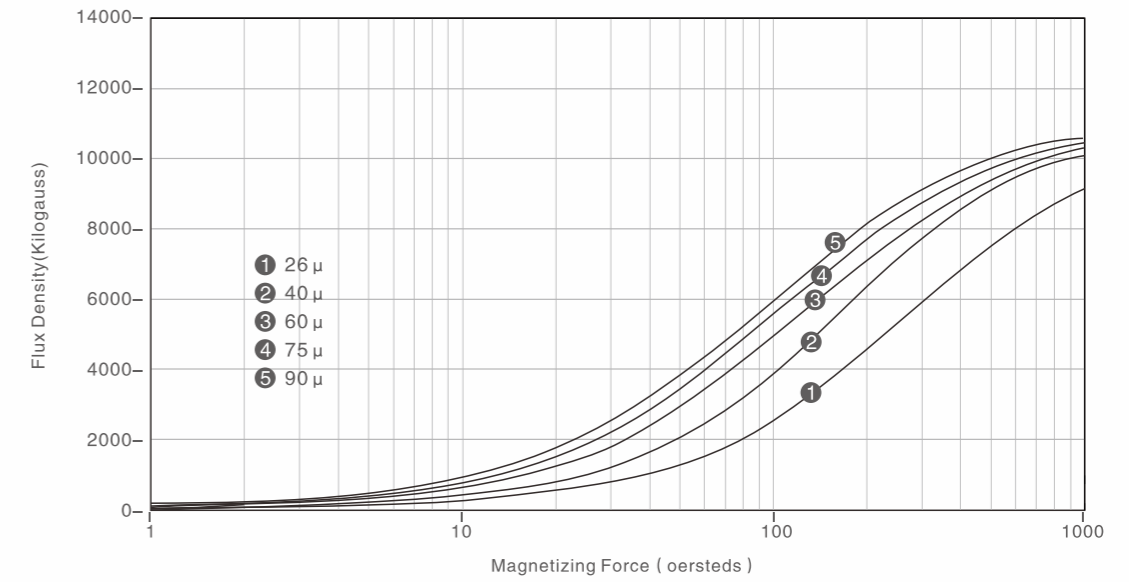
Typical Core Loss Curves(26 μ , 40 μ)
典型磁粉芯损耗曲线(26 μ , 40 μ)



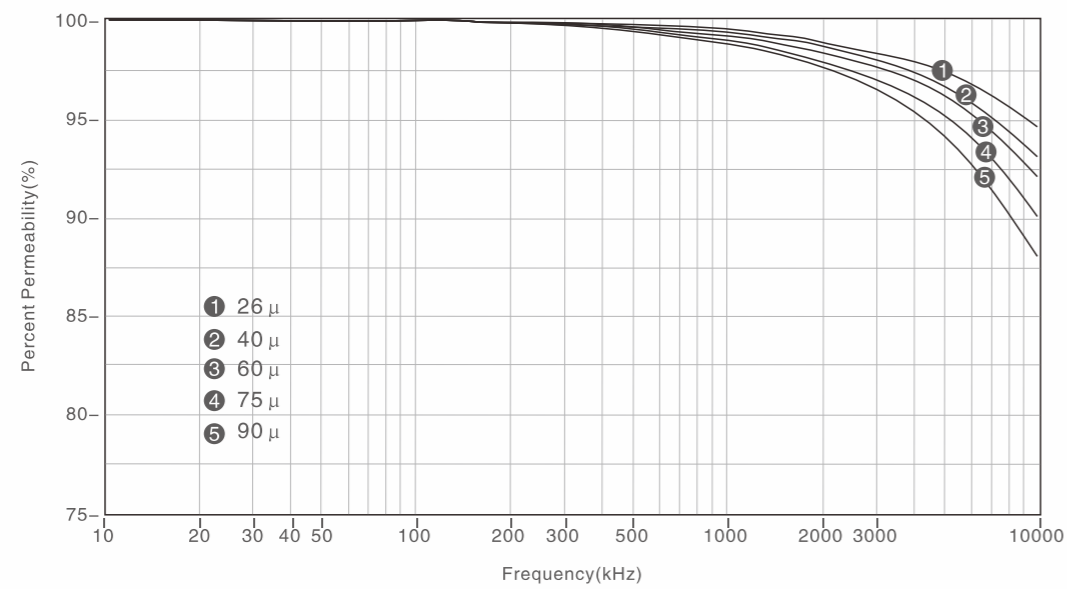
● Typical Core Loss Curves(60 μ ,75 μ ,90 μ)
典型磁粉芯损耗值曲线(60 μ ,75 μ ,90 μ)



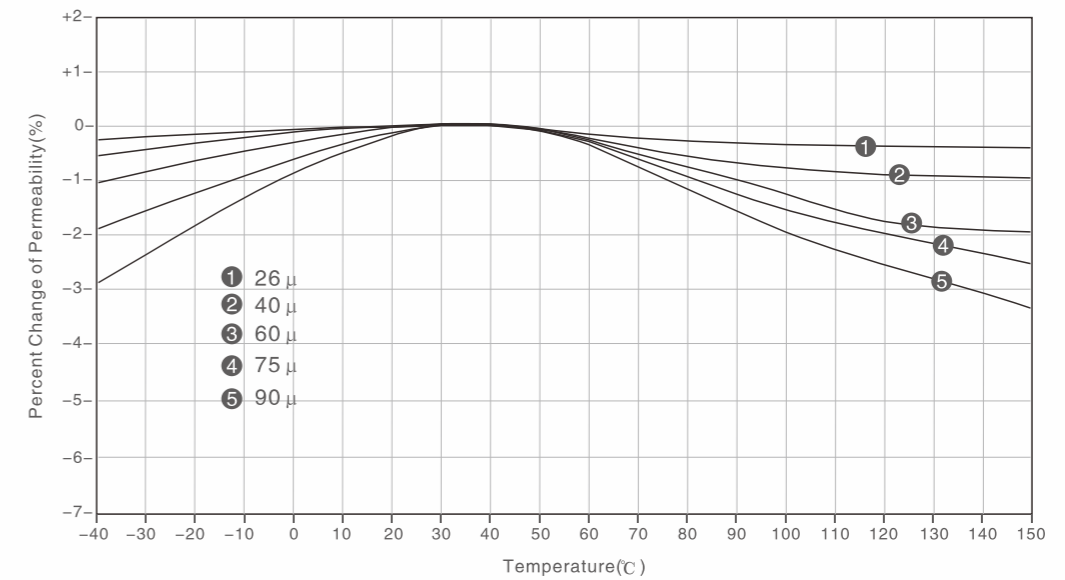
● Normal Magnetization Curves
标准磁化曲线



● Permeability vs. Frequency
磁导率与频率关系曲线



● Temperature Stability
磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS050-026A-HF	26	12	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KS050-060A-HF	60	27						
KS050-075A-HF	75	34						
KS050-090A-HF	90	40						
KS065-026A-HF	26	15	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KS065-060A-HF	60	35						
KS065-075A-HF	75	43						
KS065-090A-HF	90	52						
KS068-026A-HF	26	19	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KS068-060A-HF	60	43						
KS068-075A-HF	75	53						
KS068-090A-HF	90	64						
KS080-026A-HF	26	14	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KS080-060A-HF	60	32						
KS080-075A-HF	75	41						
KS080-090A-HF	90	49						
KS090-026A-HF	26	19	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KS090-060A-HF	60	43						
KS090-075A-HF	75	54						
KS090-090A-HF	90	65						
KS092-026A-HF	26	22	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KS092-060A-HF	60	51						
KS092-075A-HF	75	63						
KS092-090A-HF	90	76						
KS106-026A-HF	26	32	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KS106-060A-HF	60	75						
KS106-075A-HF	75	94						
KS106-090A-HF	90	113						
KS107-026A-HF	26	22	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KS107-060A-HF	60	59						
KS107-075A-HF	75	74						
KS107-090A-HF	90	89						

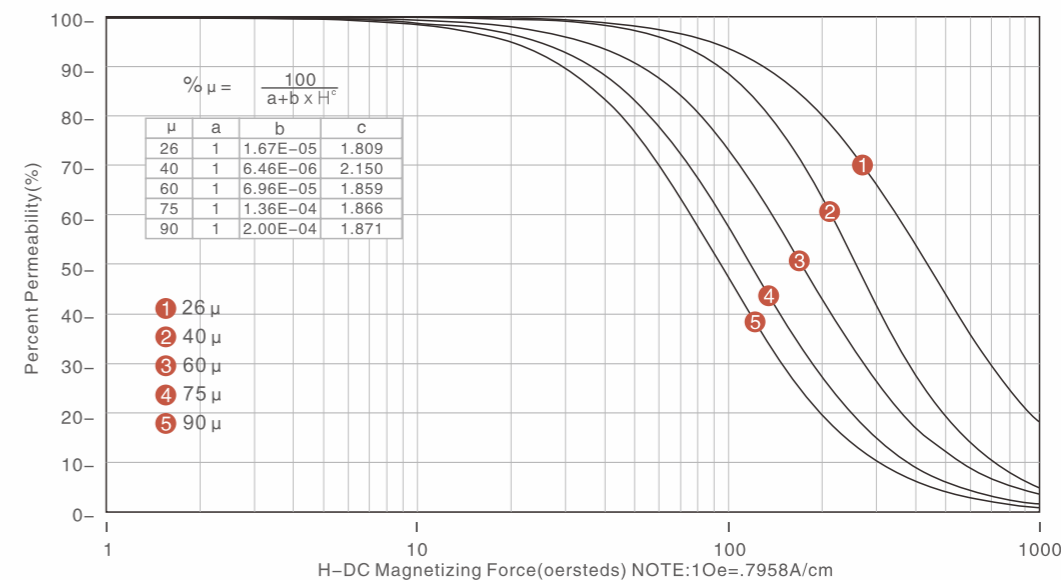
Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS130-026A-HF	26	28	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KS130-060A-HF	60	61						
KS130-075A-HF	75	76						
KS130-090A-HF	90	91						
KS131-026A-HF	26	22	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KS131-060A-HF	60	51						
KS131-075A-HF	75	64						
KS131-090A-HF	90	76.5						
KS132-026A-HF	26	28	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KS132-060A-HF	60	65						
KS132-075A-HF	75	81						
KS132-090A-HF	90	97						
KS135-026A-HF	26	16	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KS135-060A-HF	60	38						
KS135-075A-HF	75	47						
KS135-090A-HF	90	57						
KS141-026A-HF	26	24	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KS141-060A-HF	60	56						
KS141-075A-HF	75	70						
KS141-090A-HF	90	84						
KS157-026A-HF	26	35	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KS157-060A-HF	60	81						
KS157-075A-HF	75	101						
KS157-090A-HF	90	121						
KS158-026A-HF	26	53	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KS158-060A-HF	60	122						
KS158-075A-HF	75	152						
KS158-090A-HF	90	183						
KS168-026A-HF	26	47	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16
KS168-060A-HF	60	108						
KS168-075A-HF	75	135						
KS168-090A-HF	90	161						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS184-026A-HF	26	59	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KS184-060A-HF	60	135						
KS184-075A-HF	75	169						
KS184-090A-HF	90	202						
KS185-026A-HF	26	37	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KS185-060A-HF	60	86						
KS185-075A-HF	75	107						
KS185-090A-HF	90	128						
KS200-026A-HF	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KS200-060A-HF	60	73						
KS200-075A-HF	75	91						
KS200-090A-HF	90	109						
KS225-026A-HF	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KS225-060A-HF	60	75						
KS225-075A-HF	75	94						
KS225-090A-HF	90	112						
KS226-026A-HF	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KS226-060A-HF	60	138						
KS226-075A-HF	75	175						
KS226-090A-HF	90	207						
KS250-026A-HF	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KS250-060A-HF	60	192						
KS250-075A-HF	75	240						
KS250-090A-HF	90	288						
KS268-026A-HF	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KS268-060A-HF	60	143						
KS268-075A-HF	75	179						
KS268-090A-HF	90	215						
KS290-026A-HF	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KS290-060A-HF	60	206						
KS290-075A-HF	75	257						
KS290-090A-HF	90	309						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS300-026A-HF	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KS300-060A-HF	60	68						
KS300-075A-HF	75	85						
KS300-090A-HF	90	102						
KS301-026A-HF	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KS301-060A-HF	60	85						
KS301-075A-HF	75	107						
KS301-090A-HF	90	128						
KS400-026A-HF	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KS400-060A-HF	60	112						
KS400-075A-HF	75	137						
KS400-090A-HF	90	164						
KS401-026A-HF	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KS401-060A-HF	60	92						
KS401-075A-HF	75	115						
KS401-090A-HF	90	139						
KS520-026A-HF	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KS520-060A-HF	60	124						
KS520-075A-HF	75	155						
KS520-090A-HF	90	187						
KS521-026A-HF	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KS521-060A-HF	60	156						
KS521-075A-HF	75	195						
KS521-090A-HF	90	234						
KS650-026A-HF	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KS650-060A-HF	60	368						
KS651-026A-HF	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KS651-060A-HF	60	180						



● Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



05 铁硅镍磁粉芯

Neu Flux® Cores (KNF)

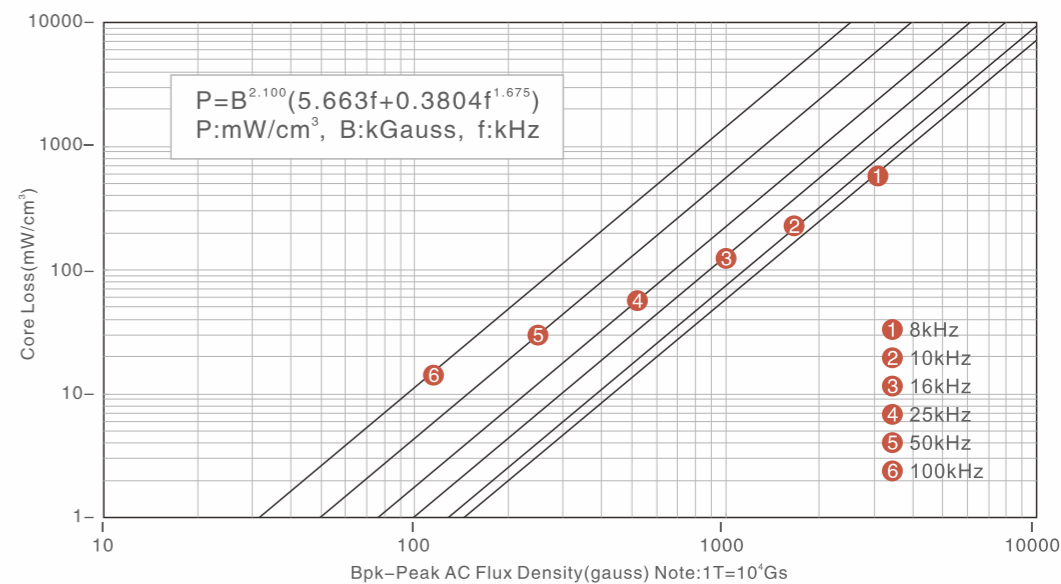
主要特征 MAIN FEATURES

- 比铁硅更低的磁芯损耗 Lower Core Losses than Si-Fe® Cores
- 高饱和磁通密度 (16000高斯) High Saturation Flux Density (16,000 Gauss)
- 优异的DC偏流特性 Excellent DC-bias Characteristics

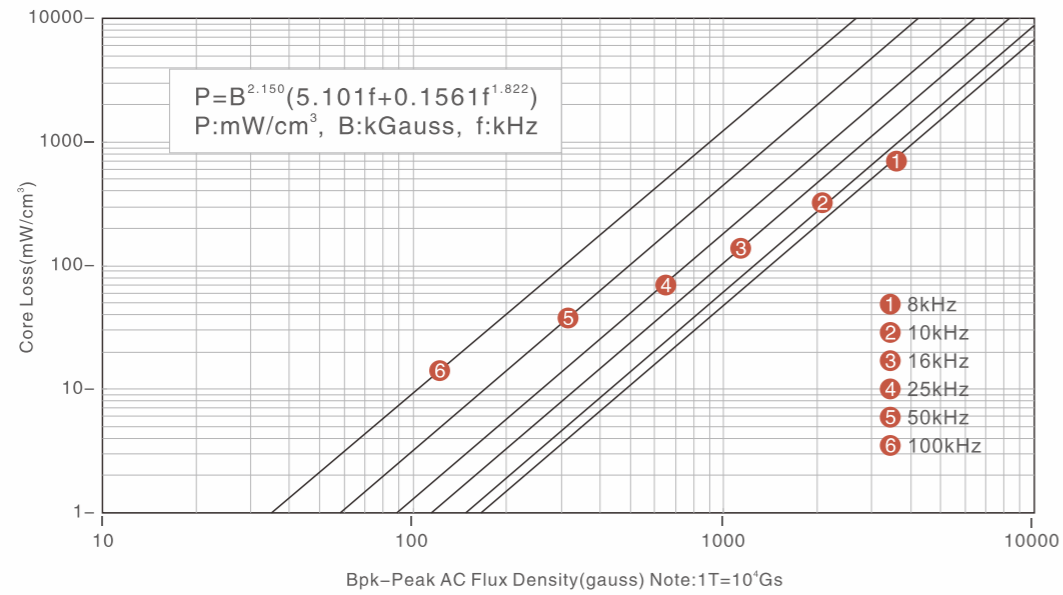
主要应用 MAIN APPLICATIONS

- 工业电源 Industrial Power
- 光伏逆变器 PV Inverter
- 不间断电源 Uninterruptible Power Supply

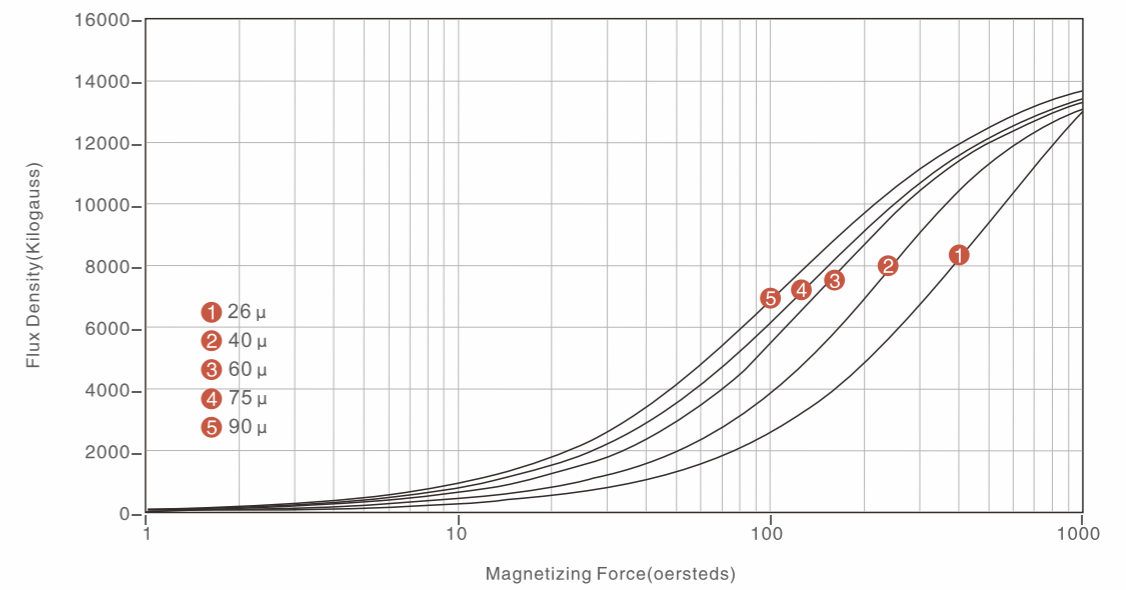
● Typical Core Loss Curves(26 μ ,40 μ)
典型磁粉芯损耗曲线(26 μ ,40 μ)



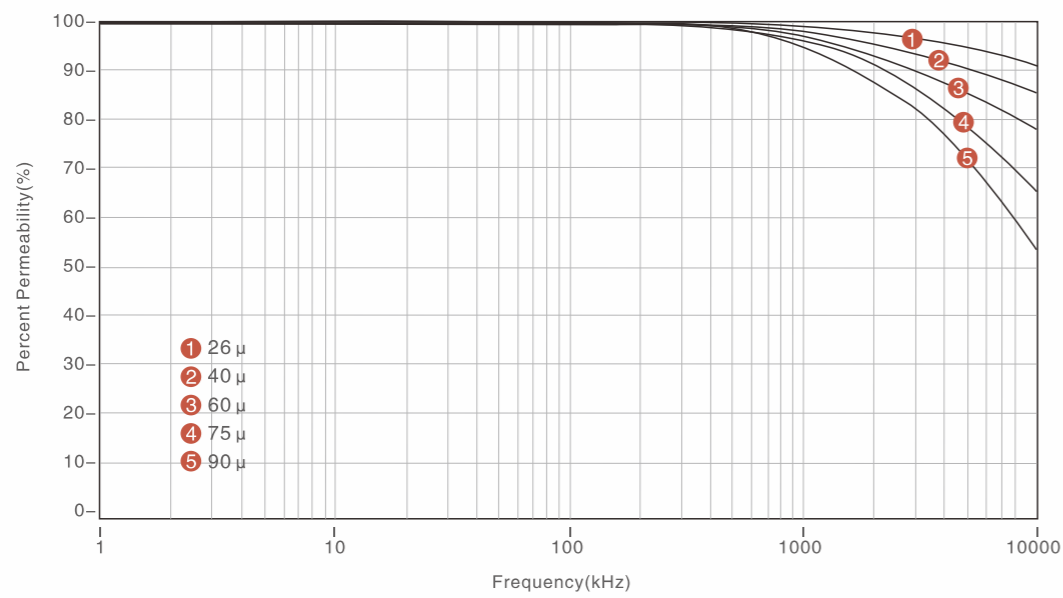
● Typical Core Loss Curves(60 μ ,75 μ ,90 μ)
 典型磁粉芯损耗值曲线(60 μ ,75 μ ,90 μ)



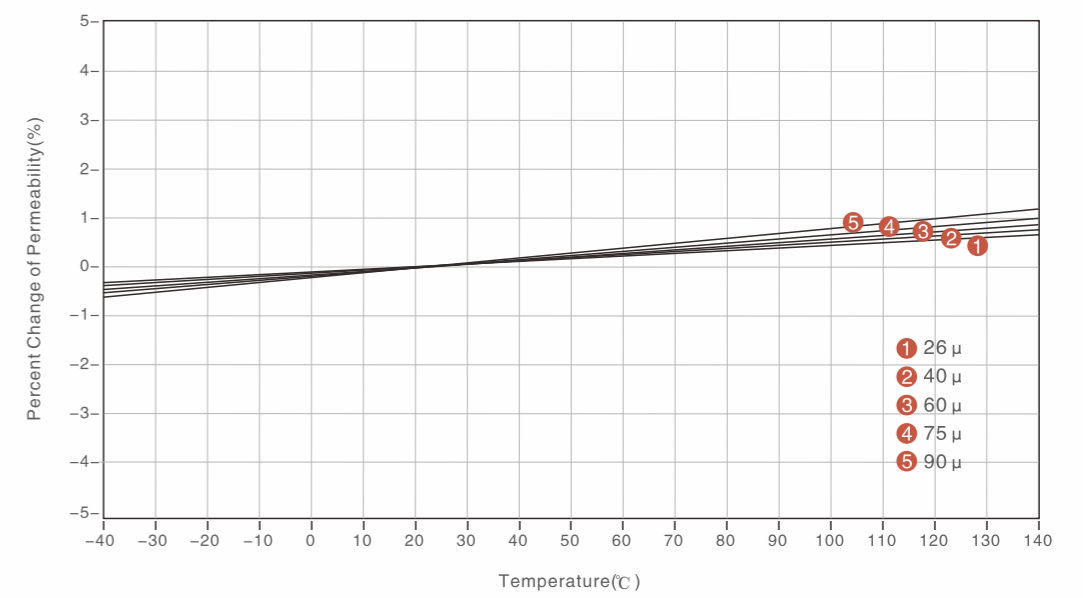
● Normal Magnetization Curves
 标准磁化曲线



● Permeability vs. Frequency
 磁导率与频率关系曲线



● Temperature Stability
 磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KNF050-026A	26	12						
KNF050-060A	60	27	1.229	0.0177	0.022	0.0594	12.70×7.62×4.75	13.46×6.99×5.51
KNF050-075A	75	34	/3.120	/0.114	/0.356	/0.383		
KNF050-090A	90	40						
KNF065-026A	26	15						
KNF065-060A	60	35	1.619	0.0298	0.048	0.1105	16.50×10.20×6.35	17.40×9.53×7.11
KNF065-075A	75	43	/4.110	/0.192	/0.789	/0.713		
KNF065-090A	90	52						
KNF068-026A	26	19						
KNF068-060A	60	43	1.630	0.0360	0.059	0.0990	17.30×9.65×6.35	18.03×9.02×7.11
KNF068-075A	75	53	/4.140	/0.232	/0.960	/0.638		
KNF068-090A	90	64						
KNF080-026A	26	14						
KNF080-060A	60	32	2.010	0.0350	0.070	0.1772	20.30×12.70×6.35	21.10×12.07×7.11
KNF080-075A	75	41	/5.090	/0.226	/1.150	/1.140		
KNF080-090A	90	49						
KNF090-026A	26	19						
KNF090-060A	60	43	2.230	0.0513	0.114	0.2181	22.90×14.07×7.62	23.62×13.39×8.38
KNF090-075A	75	54	/5.670	/0.331	/1.880	/1.410		
KNF090-090A	90	65						
KNF092-026A	26	22						
KNF092-060A	60	51	2.320	0.0610	0.142	0.2307	23.60×14.40×8.89	24.30×13.77×9.70
KNF092-075A	75	63	/5.880	/0.388	/2.280	/1.490		
KNF092-090A	90	76						
KNF106-026A	26	32						
KNF106-060A	60	75	2.500	0.1014	0.254	0.2419	26.90×14.70×11.20	27.70×14.10×11.99
KNF106-075A	75	94	/6.350	/0.654	/4.150	/1.560		
KNF106-090A	90	113						
KNF107-026A	26	22						
KNF107-060A	60	59	2.501	0.0770	0.198	0.2419	26.90×14.70×8.64	27.70×14.10×9.45
KNF107-075A	75	74	/6.352	/0.497	/3.155	/1.561		
KNF107-090A	90	89						
KNF130-026A	26	28						
KNF130-060A	60	61	3.210	0.1042	0.334	0.4537	33.00×19.90×10.70	33.83×19.30×11.61
KNF130-075A	75	76	/8.150	/0.672	/5.480	/2.930		
KNF130-090A	90	91						

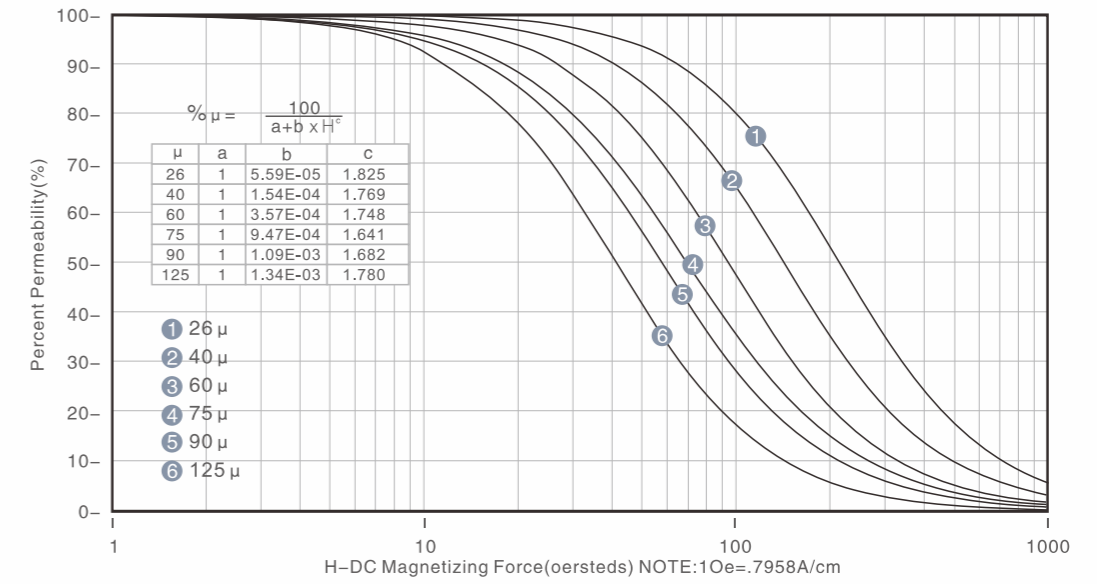
Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KNF131-026A	26	22						
KNF131-060A	60	51	3.207	0.0854	0.274	0.4537	33.00×19.90×8.76	33.83×19.30×9.70
KNF131-075A	75	64	/8.147	/0.551	/4.490	/2.927		
KNF131-090A	90	76.5						
KNF132-026A	26	28						
KNF132-060A	60	65	3.207	0.1082	0.347	0.4537	33.00×19.90×11.18	33.83×19.30×11.99
KNF132-075A	75	81	/8.147	/0.698	/5.687	/2.927		
KNF132-090A	90	97						
KNF135-026A	26	16						
KNF135-060A	60	38	3.530	0.0704	0.249	0.6193	34.30×23.40×8.89	35.10×22.56×9.83
KNF135-075A	75	47	/8.950	/0.454	/4.060	/4.010		
KNF135-090A	90	57						
KNF141-026A	26	24						
KNF141-060A	60	56	3.540	0.1051	0.372	0.5648	35.80×22.40×10.50	36.63×21.54×11.28
KNF141-075A	75	70	/8.980	/0.678	/6.088	/3.640		
KNF141-090A	90	84						
KNF157-026A	26	35						
KNF157-060A	60	81	3.880	0.1662	0.645	0.6619	39.90×24.10×14.50	40.72×23.30×15.37
KNF157-075A	75	101	/9.840	/1.072	/10.500	/4.270		
KNF157-090A	90	121						
KNF158-026A	26	53						
KNF158-060A	60	122	0.374	0.060	0.592	0.5500	40.13×22.08×17.00	40.94×21.27×17.89
KNF158-075A	75	152	/9.510	/1.537	/15.043	/3.550		
KNF158-090A	90	183						
KNF168-026A	26	47						
KNF168-060A	60	108	4.040	0.229	0.960	0.5648	42.90×24.20×16.26	44.00×23.30×17.16
KNF168-075A	75	135	/10.216	/1.475	/15.741	/3.644		
KNF168-090A	90	161						
KNF184-026A	26	59						
KNF184-060A	60	135	4.230	0.308	1.300	0.6619	46.70×24.10×18.00	47.63×23.32×18.92
KNF184-075A	75	169	/10.740	/1.990	/21.300	/4.270		
KNF184-090A	90	202						
KNF185-026A	26	37						
KNF185-060A	60	86	4.580	0.208	0.953	0.6469	46.70×28.70×15.20	47.63×27.89×16.13
KNF185-075A	75	107	/11.630	/1.340	/15.530	/6.110		
KNF185-090A	90	128						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KNF200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KNF200-060A	60	73						
KNF200-075A	75	91						
KNF200-090A	90	109						
KNF225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KNF225-060A	60	75						
KNF225-075A	75	94						
KNF225-090A	90	112						
KNF226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KNF226-060A	60	138						
KNF226-075A	75	175						
KNF226-090A	90	207						
KNF250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KNF250-060A	60	192						
KNF250-075A	75	240						
KNF250-090A	90	288						
KNF268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KNF268-060A	60	143						
KNF268-075A	75	179						
KNF268-090A	90	215						
KNF290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KNF290-060A	60	206						
KNF290-075A	75	257						
KNF290-090A	90	309						
KNF300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KNF300-060A	60	68						
KNF300-075A	75	85						
KNF300-090A	90	102						
KNF301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KNF301-060A	60	85						
KNF301-075A	75	107						
KNF301-090A	90	128						
KNF400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KNF400-060A	60	112						
KNF400-075A	75	137						
KNF400-090A	90	164						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KNF401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KNF401-060A	60	92						
KNF401-075A	75	115						
KNF401-090A	90	139						
KNF520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KNF520-060A	60	124						
KNF520-075A	75	155						
KNF520-090A	90	187						
KNF521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KNF521-060A	60	156						
KNF521-075A	75	195						
KNF521-090A	90	234						
KNF650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KNF650-060A	60	368						
KNF651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KNF651-060A	60	180						



○ Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



06 铁硅铝磁粉芯

Sendust Cores (KS)

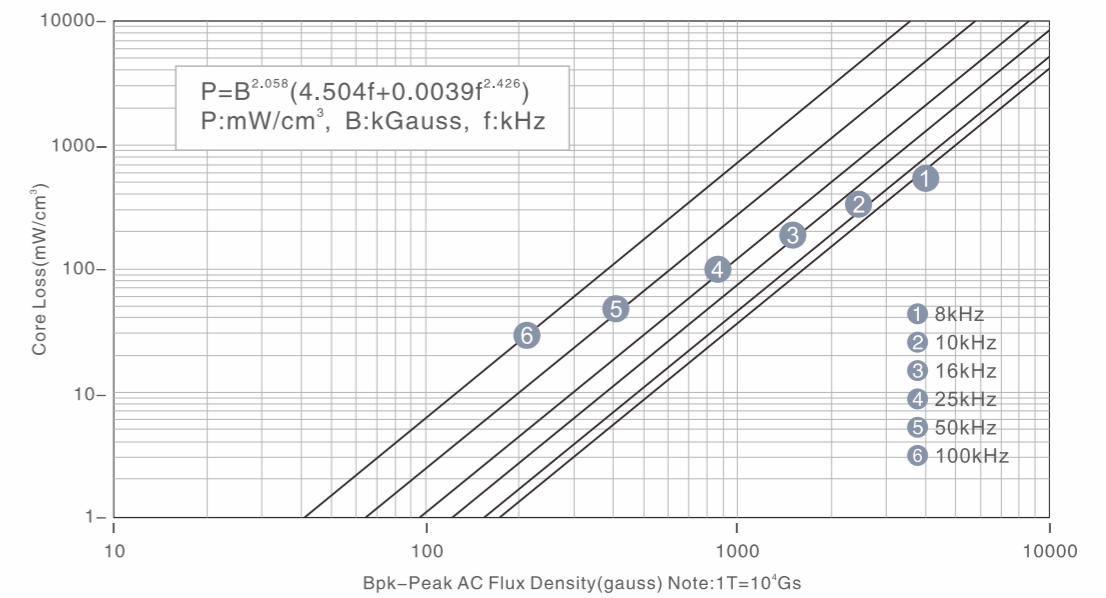
主要特征 MAIN FEATURES

- 比铁粉芯更低的损耗 Lower Core Losses than Iron Powder Cores
- 磁致伸缩接近零 Near Zero Magnetostriction
- 相对高的饱和磁感应强度 (10500高斯) Relatively High Saturation Flux Density (10,500 Gauss)

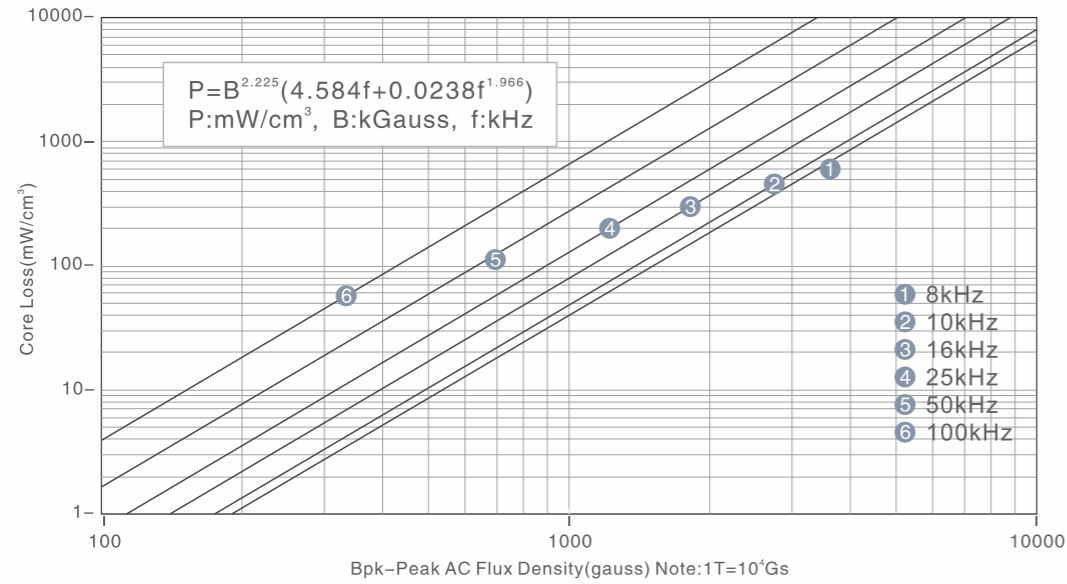
主要应用 MAIN APPLICATIONS

- PC 电源 PC Power Supply
- 电源适配器 Power Adapter
- 不间断电源 Uninterruptible Power Supply
- 有源滤波器/静态无功发生器 Active Power Filter/Static Var Generator

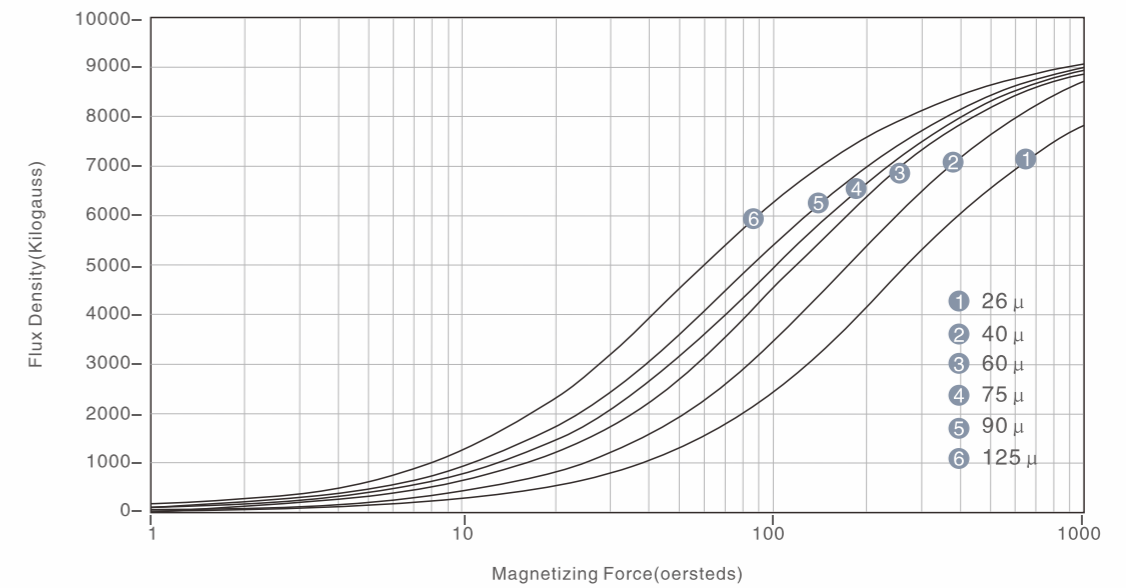
○ Typical Core Loss Curves(26 μ ,40 μ)
典型磁粉芯损耗曲线(26 μ ,40 μ)



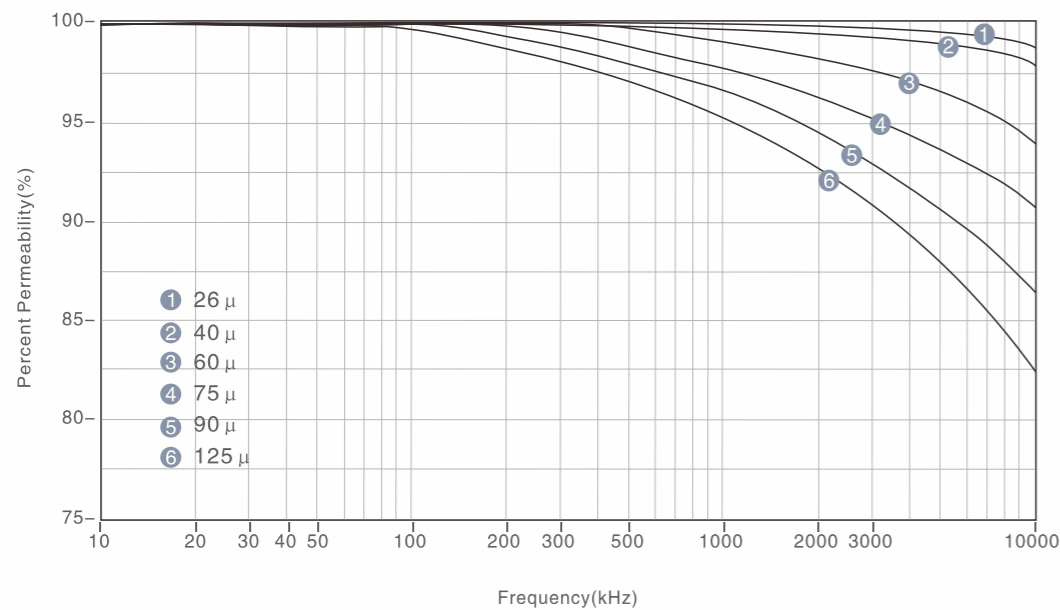
Typical Core Loss Curves(60 μ ,75 μ ,90 μ ,125 μ)
 典型磁粉芯损耗值曲线(60 μ ,75 μ ,90 μ ,125 μ)



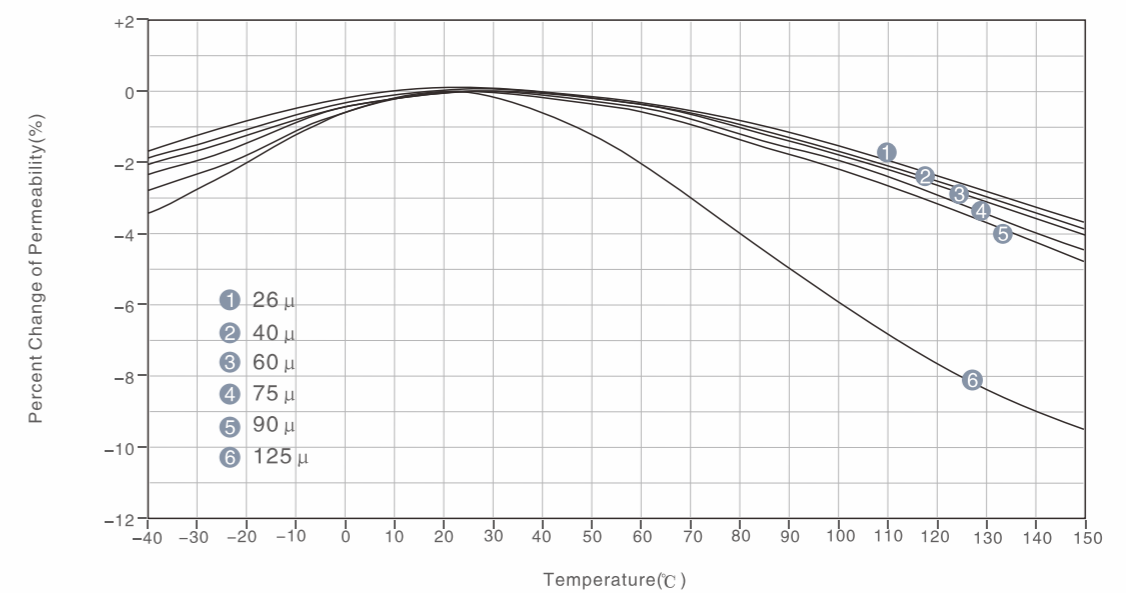
Normal Magnetization Curves
 标准磁化曲线



Permeability vs. Frequency
 磁导率与频率关系曲线



Temperature Stability
 磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS050-026A	26	12	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KS050-060A	60	27						
KS050-075A	75	34						
KS050-090A	90	40						
KS050-125A	125	56						
KS065-026A	26	15	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KS065-060A	60	35						
KS065-075A	75	43						
KS065-090A	90	52						
KS065-125A	125	72						
KS068-026A	26	19	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KS068-060A	60	43						
KS068-075A	75	53						
KS068-090A	90	64						
KS068-125A	125	89						
KS080-026A	26	14	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KS080-060A	60	32						
KS080-075A	75	41						
KS080-090A	90	49						
KS080-125A	125	68						
KS090-026A	26	19	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KS090-060A	60	43						
KS090-075A	75	54						
KS090-090A	90	65						
KS090-125A	125	90						
KS092-026A	26	22	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KS092-060A	60	51						
KS092-075A	75	63						
KS092-090A	90	76						
KS092-125A	125	105						
KS106-026A	26	32	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KS106-060A	60	75						
KS106-075A	75	94						
KS106-090A	90	113						
KS106-125A	125	157						
KS107-026A	26	22	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KS107-060A	60	59						
KS107-075A	75	74						
KS107-090A	90	89						
KS107-125A	125	123						

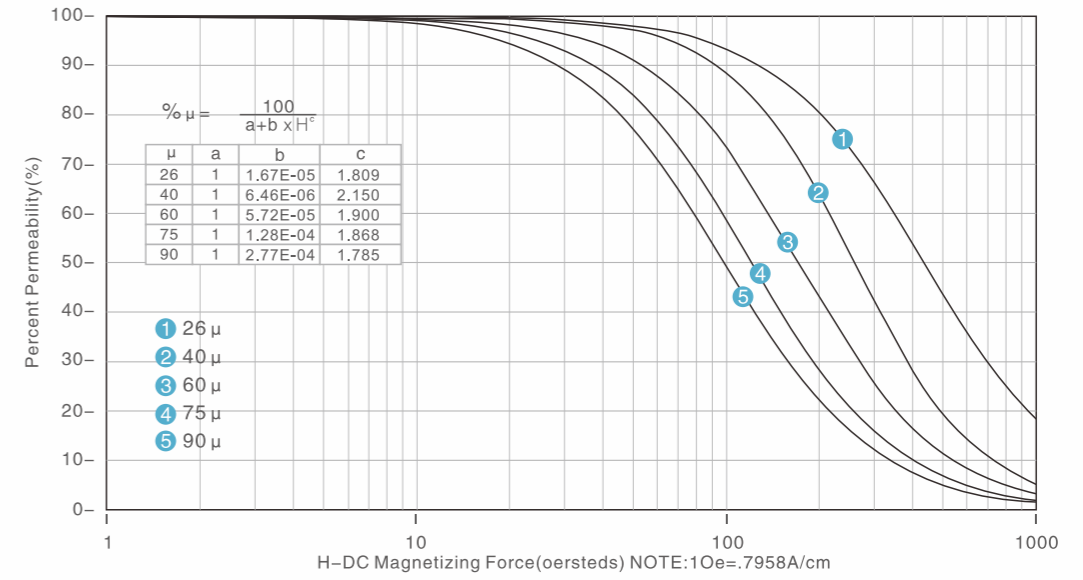
Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS130-026A	26	28	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KS130-060A	60	61						
KS130-075A	75	76						
KS130-090A	90	91						
KS130-125A	125	127						
KS131-026A	26	22	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KS131-060A	60	51						
KS131-075A	75	64						
KS131-090A	90	76.5						
KS131-125A	125	109						
KS132-026A	26	28	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KS132-060A	60	65						
KS132-075A	75	81						
KS132-090A	90	97						
KS132-125A	125	135						
KS135-026A	26	16	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KS135-060A	60	38						
KS135-075A	75	47						
KS135-090A	90	57						
KS135-125A	125	79						
KS141-026A	26	24	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KS141-060A	60	56						
KS141-075A	75	70						
KS141-090A	90	84						
KS141-125A	125	117						
KS157-026A	26	35	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KS157-060A	60	81						
KS157-075A	75	101						
KS157-090A	90	121						
KS157-125A	125	168						
KS158-026A	26	53	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KS158-060A	60	122						
KS158-075A	75	152						
KS158-090A	90	183						
KS158-125A	125	254						
KS168-026A	26	47	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16
KS168-060A	60	108						
KS168-075A	75	135						
KS168-090A	90	161						
KS168-125A	125	224						

Part Number	Perm. (μ)	AL $\pm 8\%$	ℓ_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS184-026A	26	59	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KS184-060A	60	135						
KS184-075A	75	169						
KS184-090A	90	202						
KS184-125A	125	281						
KS185-026A	26	37	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KS185-060A	60	86						
KS185-075A	75	107						
KS185-090A	90	128						
KS185-125A	125	178						
KS200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KS200-060A	60	73						
KS200-075A	75	91						
KS200-090A	90	109						
KS200-125A	125	152						
KS225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KS225-060A	60	75						
KS225-075A	75	94						
KS225-090A	90	112						
KS225-125A	125	156						
KS226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KS226-060A	60	138						
KS226-075A	75	175						
KS226-090A	90	207						
KS226-125A	125	287						
KS250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KS250-060A	60	192						
KS250-075A	75	240						
KS250-090A	90	288						
KS250-125A	125	400						
KS268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KS268-060A	60	143						
KS268-075A	75	179						
KS268-090A	90	215						
KS268-125A	125	298						
KS290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KS290-060A	60	206						
KS290-075A	75	257						
KS290-090A	90	309						
KS290-125A	125	429						

Part Number	Perm. (μ)	AL $\pm 8\%$	ℓ_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KS300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KS300-060A	60	68						
KS300-075A	75	85						
KS300-090A	90	102						
KS300-125A	125	142						
KS301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KS301-060A	60	85						
KS301-075A	75	107						
KS301-090A	90	128						
KS301-125A	125	178						
KS400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KS400-060A	60	112						
KS400-075A	75	137						
KS400-090A	90	164						
KS400-125A	125	228						
KS401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KS401-060A	60	92						
KS401-075A	75	115						
KS401-090A	90	139						
KS401-125A	125	192						
KS520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KS520-060A	60	124						
KS520-075A	75	155						
KS520-090A	90	187						
KS520-125A	125	259						
KS521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KS521-060A	60	156						
KS521-075A	75	195						
KS521-090A	90	234						
KS521-125A	125	325						
KS650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KS650-060A	60	368						
KS650-075A	75	460						
KS650-090A	90	552						
KS651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KS651-060A	60	180						
KS651-075A	75	225						
KS651-090A	90	270						



● Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



07 硅铁磁粉芯

Si-Fe® Cores (KSF)

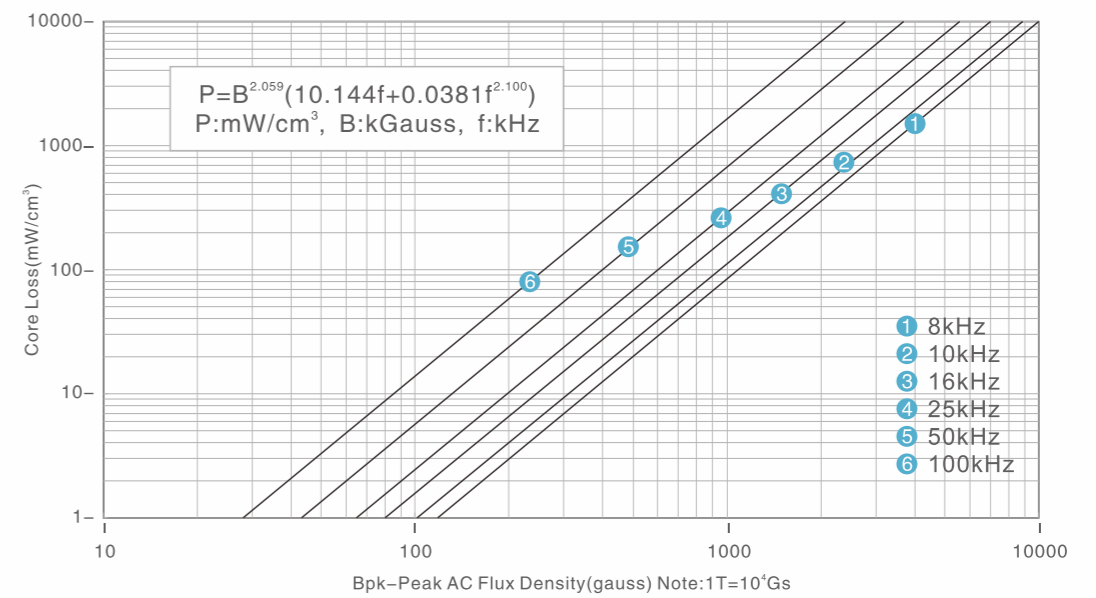
主要特征 MAIN FEATURES

- 高饱和磁通密度 (16000高斯) High Saturation Flux Density (16,000 Gauss)
- 优异的DC偏流特性 Excellent DC-bias Characteristics
- 无热老化的问题 Excellent Thermal Stability Without Aging Problem

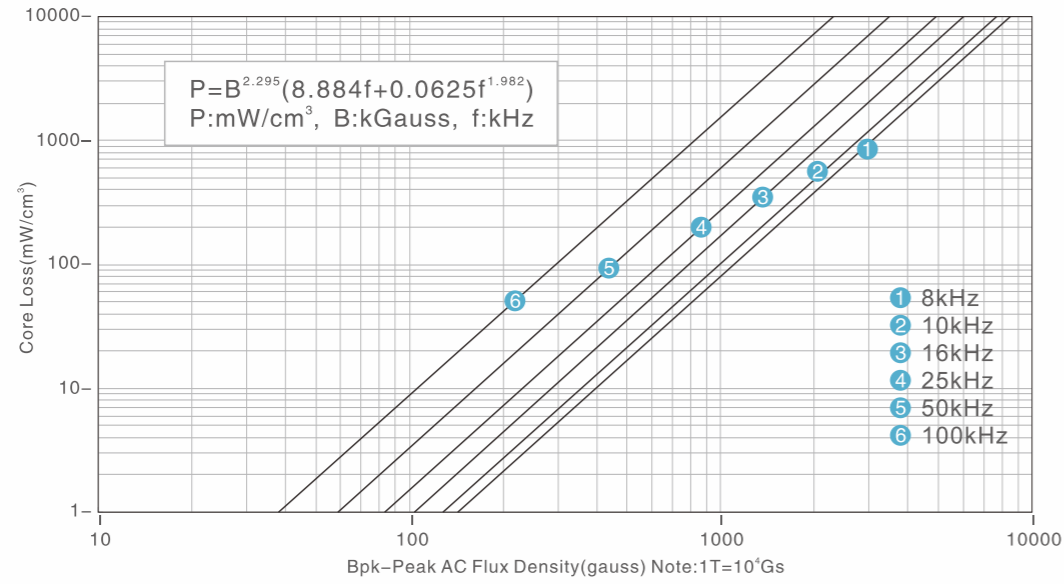
主要应用 MAIN APPLICATIONS

- 工业电源 Industrial Power Supply
- 光伏逆变器 PV Inverter
- 不间断电源 Uninterruptible Power Supply

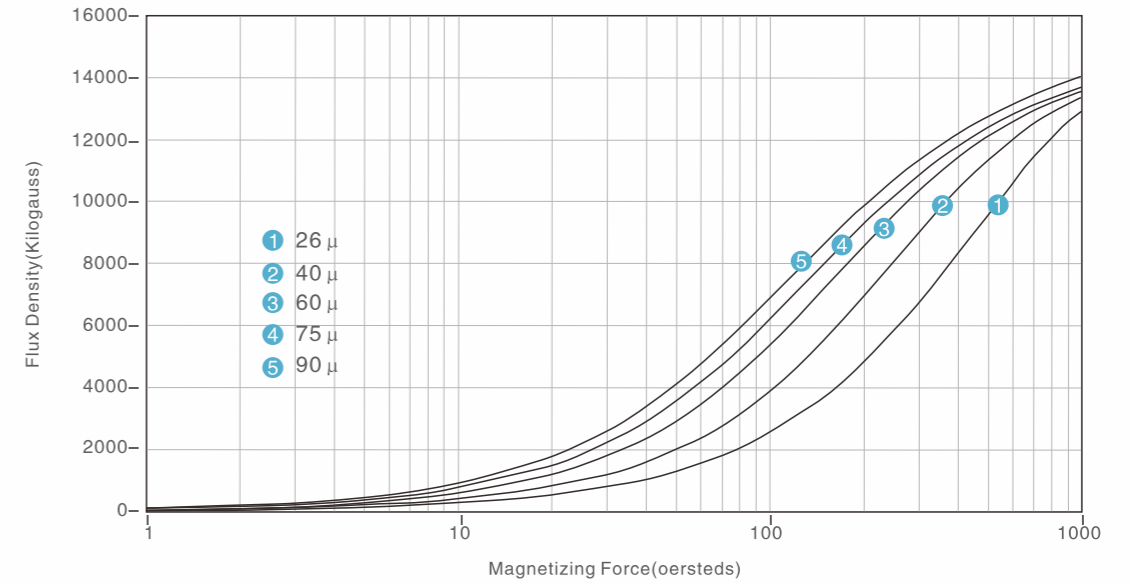
● Typical Core Loss Curves(26 μ ,40 μ)
典型磁粉芯损耗曲线(26 μ ,40 μ)



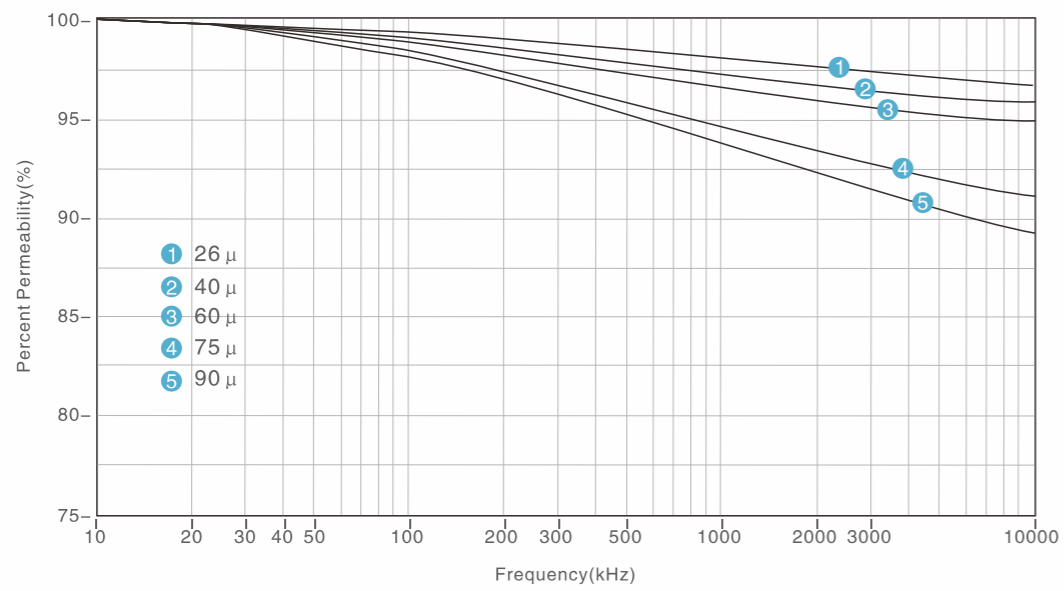
Typical Core Loss Curves(60 μ ,75 μ ,90 μ)
 典型磁粉芯损耗值曲线(60 μ ,75 μ ,90 μ)



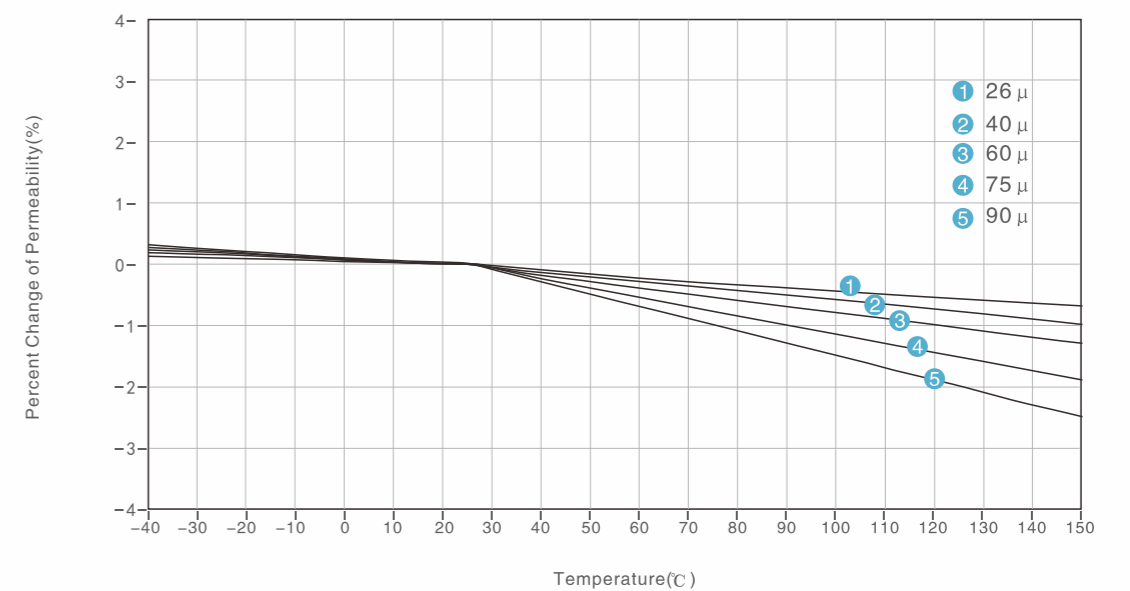
Normal Magnetization Curves
 标准磁化曲线



Permeability vs. Frequency
 磁导率与频率关系曲线



Temperature Stability
 磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KSF050-026A	26	12						
KSF050-060A	60	27	1.229	0.0177	0.022	0.0594	12.70×7.62×4.75	13.46×6.99×5.51
KSF050-075A	75	34	/3.120	/0.114	/0.356	/0.383		
KSF050-090A	90	40						
KSF065-026A	26	15						
KSF065-060A	60	35	1.619	0.0298	0.048	0.1105	16.50×10.20×6.35	17.40×9.53×7.11
KSF065-075A	75	43	/4.110	/0.192	/0.789	/0.713		
KSF065-090A	90	52						
KSF068-026A	26	19						
KSF068-060A	60	43	1.630	0.0360	0.059	0.0990	17.30×9.65×6.35	18.03×9.02×7.11
KSF068-075A	75	53	/4.140	/0.232	/0.960	/0.638		
KSF068-090A	90	64						
KSF080-026A	26	14						
KSF080-060A	60	32	2.010	0.0350	0.070	0.1772	20.30×12.70×6.35	21.10×12.07×7.11
KSF080-075A	75	41	/5.090	/0.226	/1.150	/1.140		
KSF080-090A	90	49						
KSF090-026A	26	19						
KSF090-060A	60	43	2.230	0.0513	0.114	0.2181	22.90×14.07×7.62	23.62×13.39×8.38
KSF090-075A	75	54	/5.670	/0.331	/1.880	/1.410		
KSF090-090A	90	65						
KSF092-026A	26	22						
KSF092-060A	60	51	2.320	0.0610	0.142	0.2307	23.60×14.40×8.89	24.30×13.77×9.70
KSF092-075A	75	63	/5.880	/0.388	/2.280	/1.490		
KSF092-090A	90	76						
KSF106-026A	26	32						
KSF106-060A	60	75	2.500	0.1014	0.254	0.2419	26.90×14.70×11.20	27.70×14.10×11.99
KSF106-075A	75	94	/6.350	/0.654	/4.150	/1.560		
KSF106-090A	90	113						
KSF107-026A	26	22						
KSF107-060A	60	59	2.501	0.0770	0.198	0.2419	26.90×14.70×8.64	27.70×14.10×9.45
KSF107-075A	75	74	/6.352	/0.497	/3.155	/1.561		
KSF107-090A	90	89						
KSF130-026A	26	28						
KSF130-060A	60	61	3.210	0.1042	0.334	0.4537	33.00×19.90×10.70	33.83×19.30×11.61
KSF130-075A	75	76	/8.150	/0.672	/5.480	/2.930		
KSF130-090A	90	91						

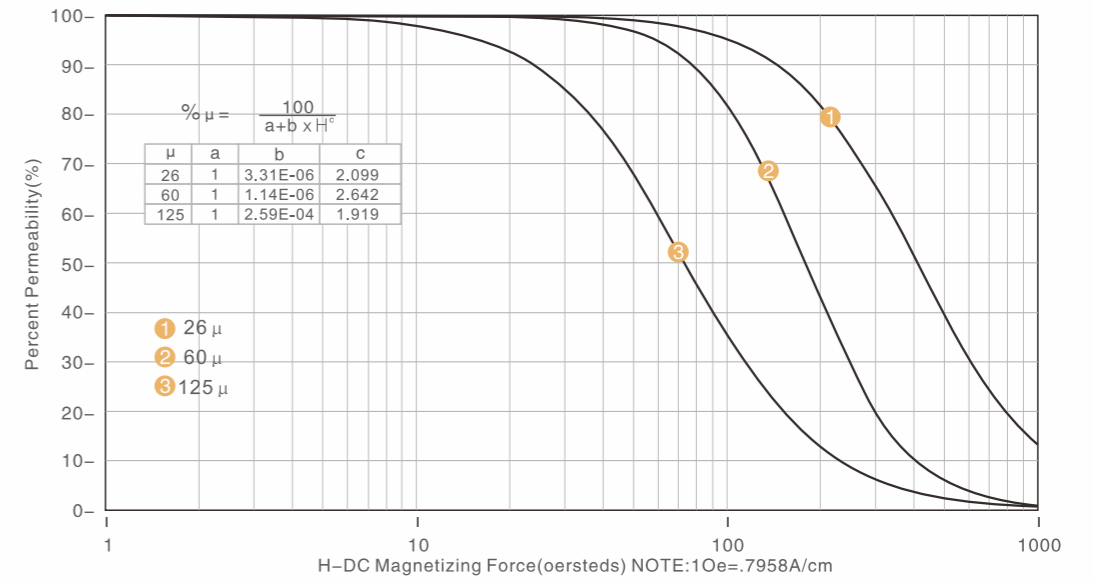
Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KSF131-026A	26	22						
KSF131-060A	60	51	3.207	0.0854	0.274	0.4537	33.00×19.90×8.76	33.83×19.30×9.70
KSF131-075A	75	64	/8.147	/0.551	/4.490	/2.927		
KSF131-090A	90	76.5						
KSF132-026A	26	28						
KSF132-060A	60	65	3.207	0.1082	0.347	0.4537	33.00×19.90×11.18	33.83×19.30×11.99
KSF132-075A	75	81	/8.147	/0.698	/5.687	/2.927		
KSF132-090A	90	97						
KSF135-026A	26	16						
KSF135-060A	60	38	3.530	0.0704	0.249	0.6193	34.30×23.40×8.89	35.10×22.56×9.83
KSF135-075A	75	47	/8.950	/0.454	/4.060	/4.010		
KSF135-090A	90	57						
KSF141-026A	26	24						
KSF141-060A	60	56	3.540	0.1051	0.372	0.5648	35.80×22.40×10.50	36.63×21.54×11.28
KSF141-075A	75	70	/8.980	/0.678	/6.088	/3.640		
KSF141-090A	90	84						
KSF157-026A	26	35						
KSF157-060A	60	81	3.880	0.1662	0.645	0.6619	39.90×24.10×14.50	40.72×23.30×15.37
KSF157-075A	75	101	/9.840	/1.072	/10.500	/4.270		
KSF157-090A	90	121						
KSF158-026A	26	53						
KSF158-060A	60	122	0.374	0.060	0.592	0.5500	40.13×22.08×17.00	40.94×21.27×17.89
KSF158-075A	75	152	/9.510	/1.537	/15.043	/3.550		
KSF158-090A	90	183						
KSF168-026A	26	47						
KSF168-060A	60	108	4.040	0.229	0.960	0.5648	42.90×24.20×16.26	44.00×23.30×17.16
KSF168-075A	75	135	/10.216	/1.475	/15.741	/3.644		
KSF168-090A	90	161						
KSF184-026A	26	59						
KSF184-060A	60	135	4.230	0.308	1.300	0.6619	46.70×24.10×18.00	47.63×23.32×18.92
KSF184-075A	75	169	/10.740	/1.990	/21.300	/4.270		
KSF184-090A	90	202						
KSF185-026A	26	37						
KSF185-060A	60	86	4.580	0.208	0.953	0.6469	46.70×28.70×15.20	47.63×27.89×16.13
KSF185-075A	75	107	/11.630	/1.340	/15.530	/6.110		
KSF185-090A	90	128						

Part Number	Perm. (μ)	AL ±8%	l_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)			
							OD (max) × ID (min) × HT (max)			
							Before Coating	After Coating		
KSF200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50		51.69×30.94×14.35	
KSF200-060A	60	73								
KSF200-075A	75	91								
KSF200-090A	90	109								
KSF225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00		58.00×34.70×14.86	
KSF225-060A	60	75								
KSF225-075A	75	94								
KSF225-090A	90	112								
KSF226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20		58.00×25.60×16.10	
KSF226-060A	60	138								
KSF226-075A	75	175								
KSF226-090A	90	207								
KSF250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00		63.10×31.37×26.27	
KSF250-060A	60	192								
KSF250-075A	75	240								
KSF250-090A	90	288								
KSF268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00		69.40×34.70×21.40	
KSF268-060A	60	143								
KSF268-075A	75	179								
KSF268-090A	90	215								
KSF290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00		75.20×44.07×36.27	
KSF290-060A	60	206								
KSF290-075A	75	257								
KSF290-090A	90	309								
KSF300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70		78.90×48.20×13.84	
KSF300-060A	60	68								
KSF300-075A	75	85								
KSF300-090A	90	102								
KSF301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90		78.90×48.20×17.02	
KSF301-060A	60	85								
KSF301-075A	75	107								
KSF301-090A	90	128								
KSF400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51		103.12×55.75×17.78	
KSF400-060A	60	112								
KSF400-075A	75	137								
KSF400-090A	90	164								

Part Number	Perm. (μ)	AL ±8%	l_c in/cm	A_c in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)			
							OD (max) × ID (min) × HT (max)			
							Before Coating	After Coating		
KSF401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59		103.12×55.75×14.86	
KSF401-060A	60	92								
KSF401-075A	75	115								
KSF401-090A	90	139								
KSF520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32		133.96×77.04×21.72	
KSF520-060A	60	124								
KSF520-075A	75	155								
KSF520-090A	90	187								
KSF521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40		133.96×77.04×26.80	
KSF521-060A	60	156								
KSF521-075A	75	195								
KSF521-090A	90	234								
KSF650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80		167.20×86.90×52.90	
KSF650-060A	60	368								
KSF651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75		166.50×101.00×33.15	
KSF651-060A	60	180								



● Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



08 高磁通铁镍磁粉芯

High Flux Cores (KH)

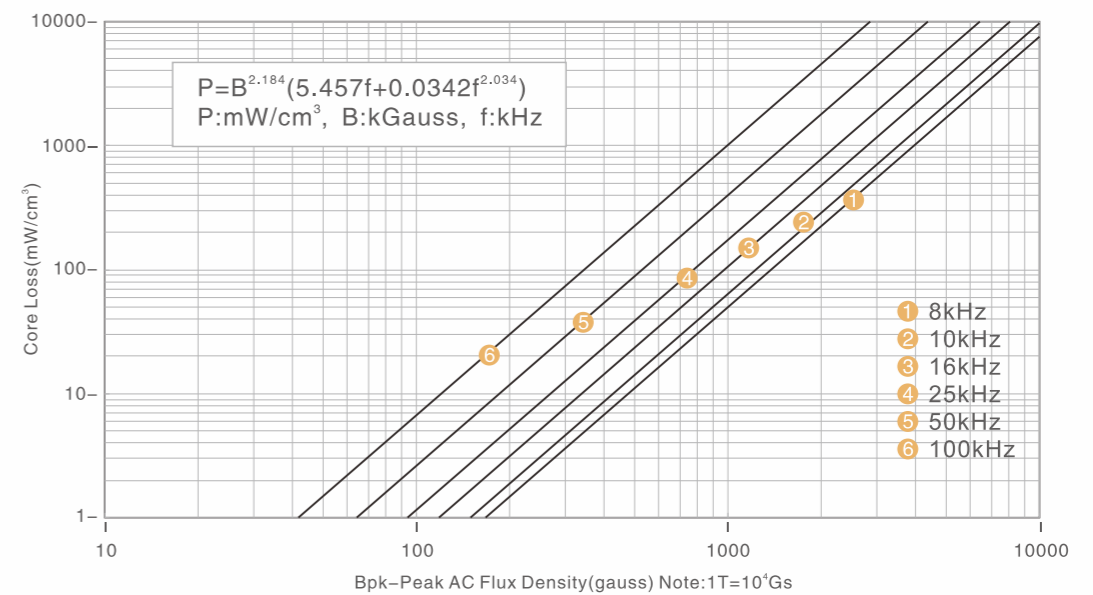
主要特征 MAIN FEATURES

- 最优的DC偏置能力 Excellent DC-bias Characteristics
- 高饱和磁通密度 (15000高斯) High Saturation Flux Density (15,000 Gauss)
- 低磁芯损耗 Low Core Losses

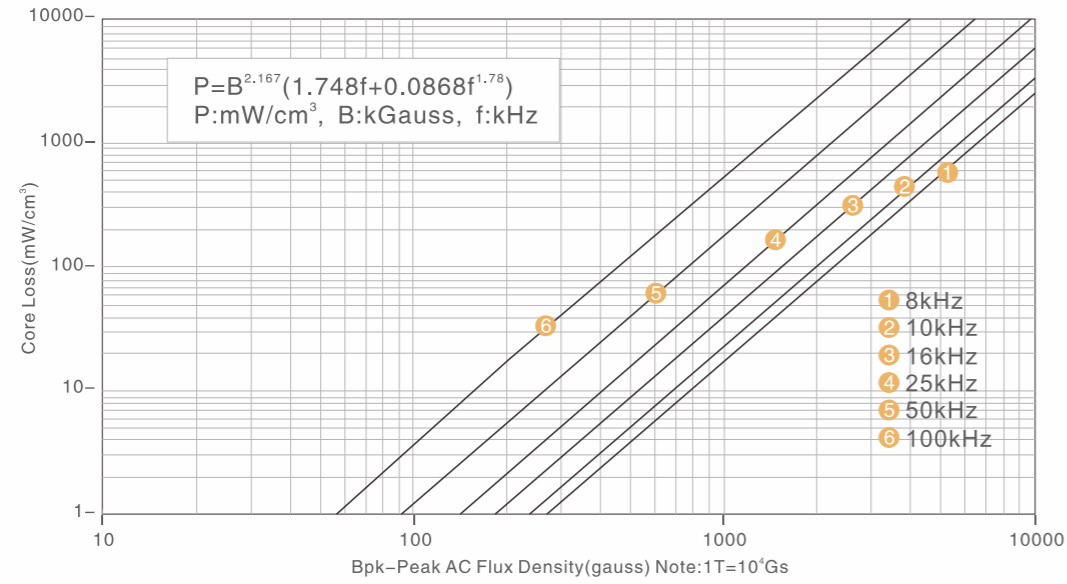
主要应用 MAIN APPLICATIONS

- 新能源汽车车载充电机 Automotive OBC
- 高效率服务器电源 High Efficiency Server Power Supply
- 通信电源 Communication Power Supply

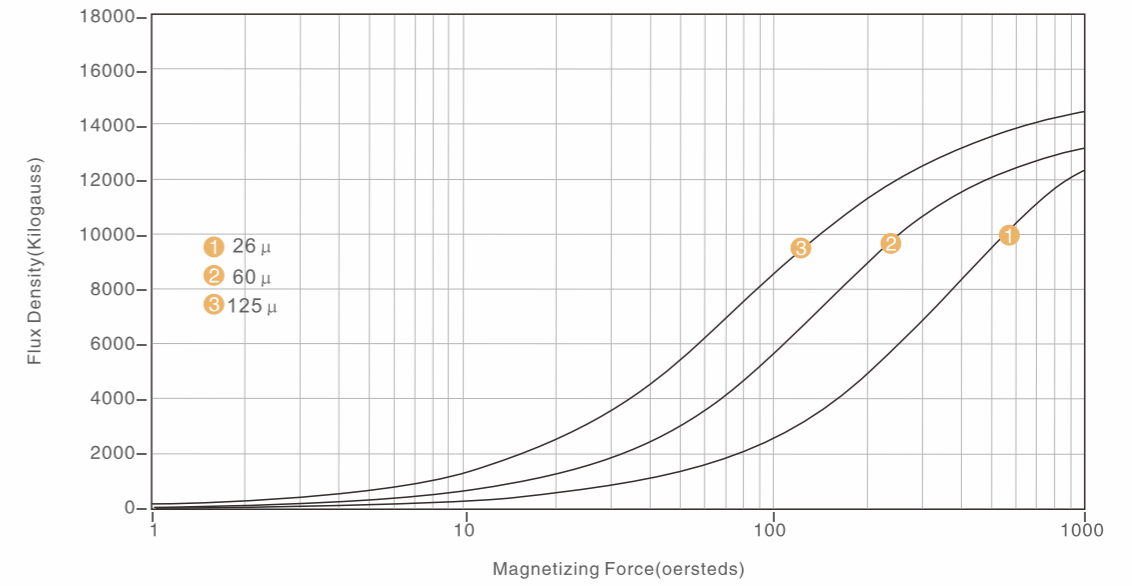
● Typical Core Loss Curves(26 μ)
典型磁粉芯损耗曲线(26 μ)



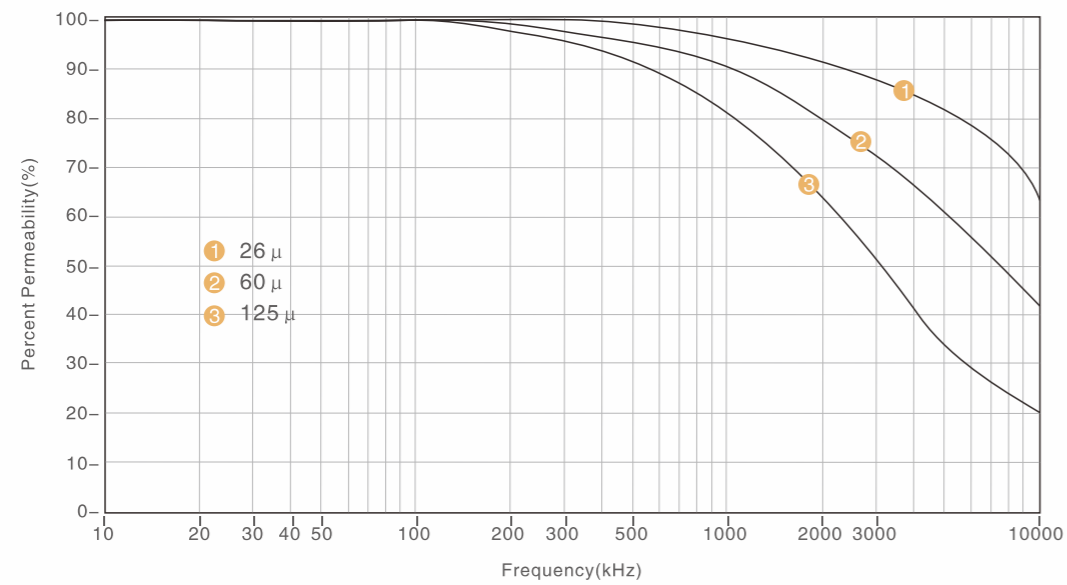
Typical Core Loss Curves(60 μ , 125 μ)
典型磁粉芯损耗值曲线(60 μ , 125 μ)



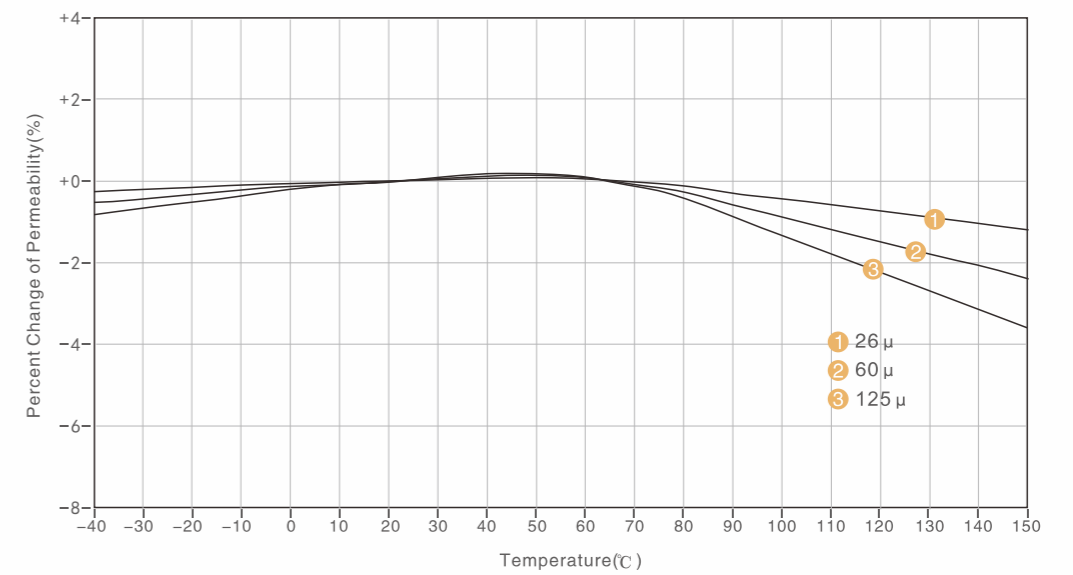
Normal Magnetization Curves
标准磁化曲线



Permeability vs. Frequency
磁导率与频率关系曲线



Temperature Stability
磁导率百分率与温度关系曲线

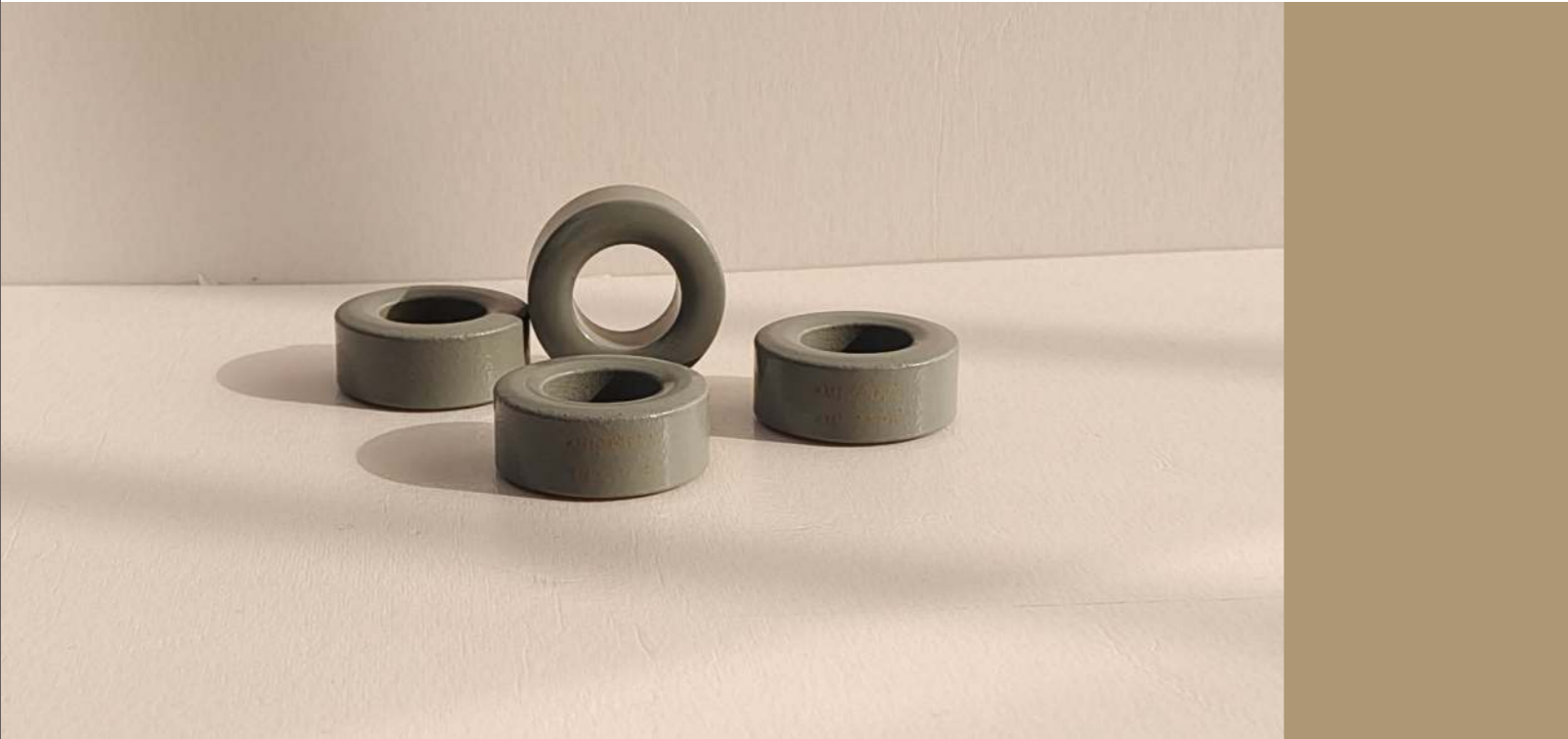


Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KH050-026A	26	12	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KH050-060A	60	27						
KH050-125A	125	56						
KH065-026A	26	15	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KH065-060A	60	35						
KH065-125A	125	72						
KH068-026A	26	19	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KH068-060A	60	43						
KH068-125A	125	89						
KH080-026A	26	14	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KH080-060A	60	32						
KH080-125A	125	68						
KH090-026A	26	19	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KH090-060A	60	43						
KH090-125A	125	90						
KH092-026A	26	22	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KH092-060A	60	51						
KH092-125A	125	105						
KH106-026A	26	32	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KH106-060A	60	75						
KH106-125A	125	157						
KH107-026A	26	22	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KH107-060A	60	59						
KH107-125A	125	123						
KH130-026A	26	28	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KH130-060A	60	61						
KH130-125A	125	127						
KH131-026A	26	22	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KH131-060A	60	51						
KH131-125A	125	109						

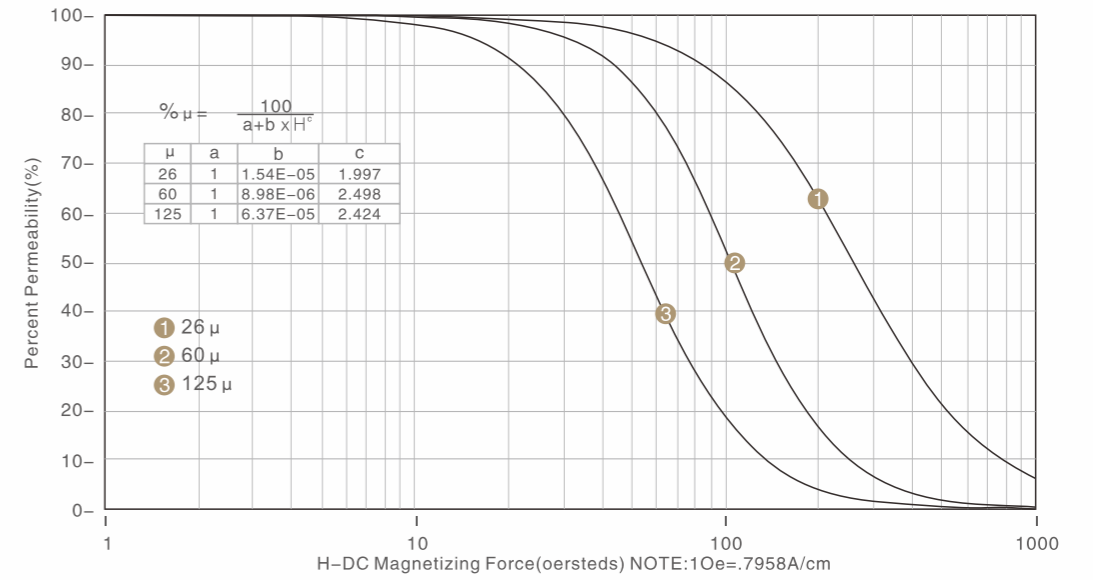
Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KH132-026A	26	28	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KH132-060A	60	65						
KH132-125A	125	135						
KH135-026A	26	16	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KH135-060A	60	38						
KH135-125A	125	79						
KH141-026A	26	24	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KH141-060A	60	56						
KH141-125A	125	117						
KH157-026A	26	35	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KH157-060A	60	81						
KH157-125A	125	168						
KH158-026A	26	53	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KH158-060A	60	122						
KH158-125A	125	254						
KH168-026A	26	47	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16
KH168-060A	60	108						
KH168-125A	125	224						
KH184-026A	26	59	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KH184-060A	60	135						
KH184-125A	125	281						
KH185-026A	26	37	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KH185-060A	60	86						
KH185-125A	125	178						
KH200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KH200-060A	60	73						
KH200-125A	125	152						
KH225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KH225-060A	60	75						
KH225-125A	125	156						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KH226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KH226-060A	60	138						
KH226-125A	125	287						
KH250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KH250-060A	60	192						
KH250-125A	125	400						
KH268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KH268-060A	60	143						
KH268-125A	125	298						
KH290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KH290-060A	60	206						
KH290-125A	125	429						
KH300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KH300-060A	60	68						
KH300-125A	125	142						
KH301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KH301-060A	60	85						
KH301-125A	125	178						
KH400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KH400-060A	60	112						
KH400-125A	125	228						
KH401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KH401-060A	60	92						
KH401-125A	125	192						
KH520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KH520-060A	60	124						
KH520-125A	125	259						
KH521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KH521-060A	60	156						
KH521-125A	125	325						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KH650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KH650-060A	60	368						
KH651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KH651-060A	60	180						



● Percent Change of Permeability vs. DC Magnetizing Force
磁导率百分率与DC磁化力关系曲线



09 铁镍钼磁粉芯

MPP Cores (KM)

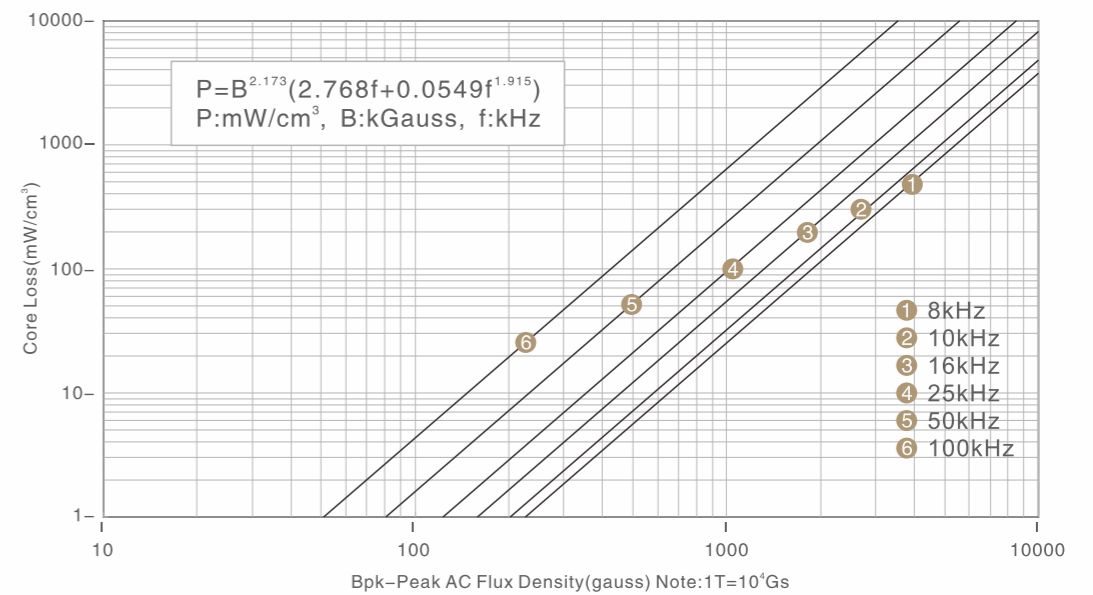
主要特征 MAIN FEATURES

- 高电阻率、低磁滞和低涡流损耗 High Resistivity, Low Hysteresis and Eddy Current Losses
- 损耗最低 Lowest Core Losses
- 最佳的温度稳定性 Excellent Temperature Stability

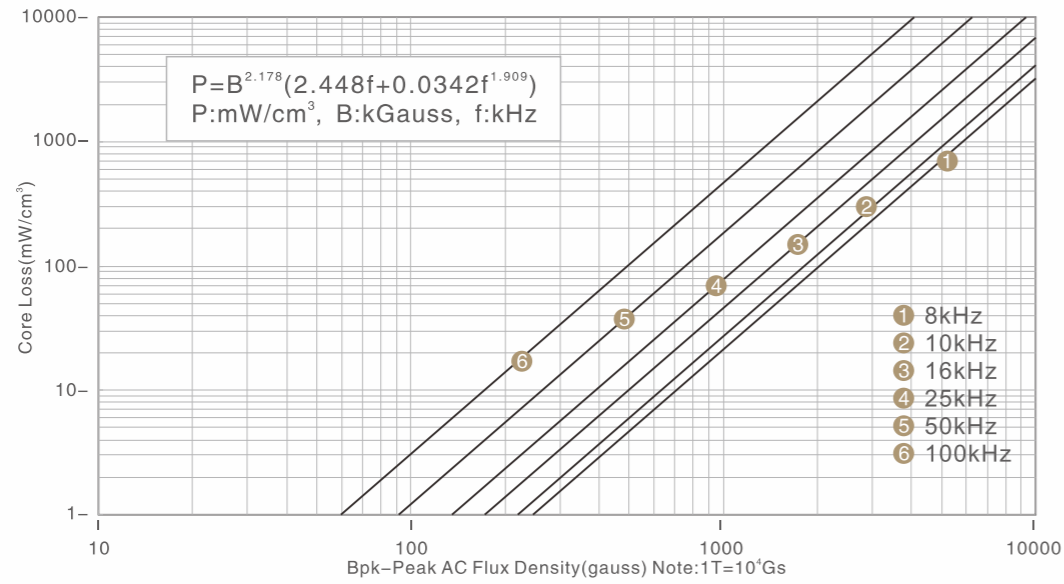
主要应用 MAIN APPLICATIONS

- 航空电源 Aerospace Power Supply
- 国防电源 Defense Power Supply
- 医用电源 Medical Power Supply
- 高效率电源 High Efficiency Power Supply

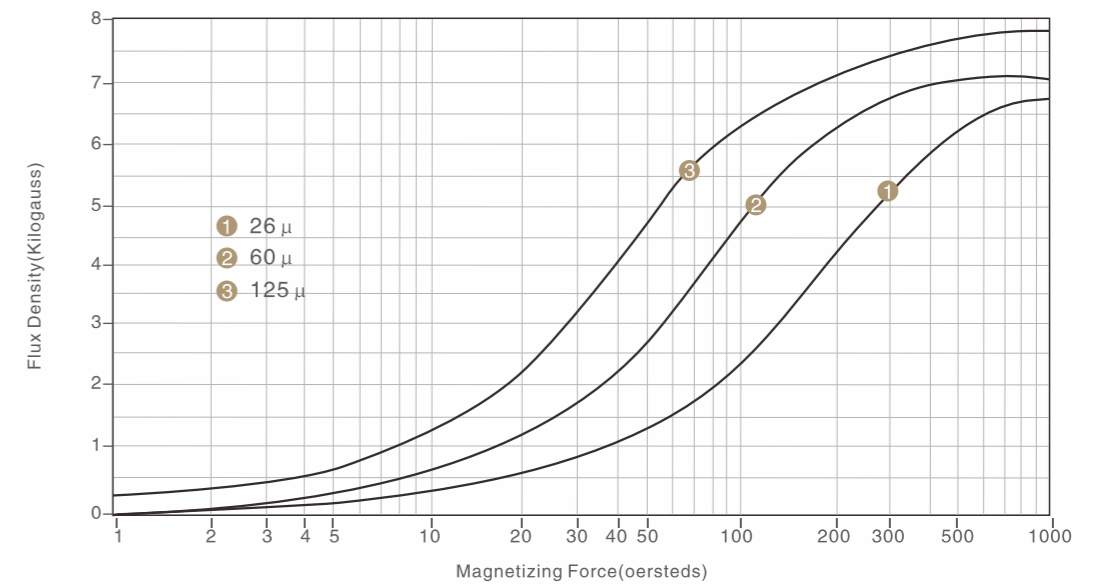
● Typical Core Loss Curves(26 μ)
典型磁粉芯损耗曲线(26 μ)



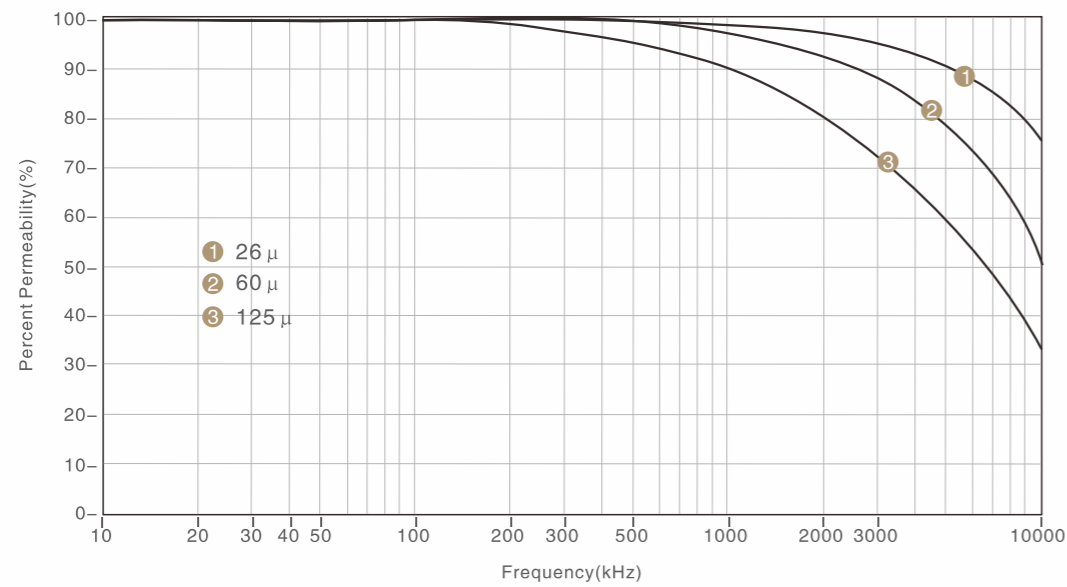
● Typical Core Loss Curves(60 μ , 125 μ)
典型磁粉芯损耗值曲线(60 μ , 125 μ)



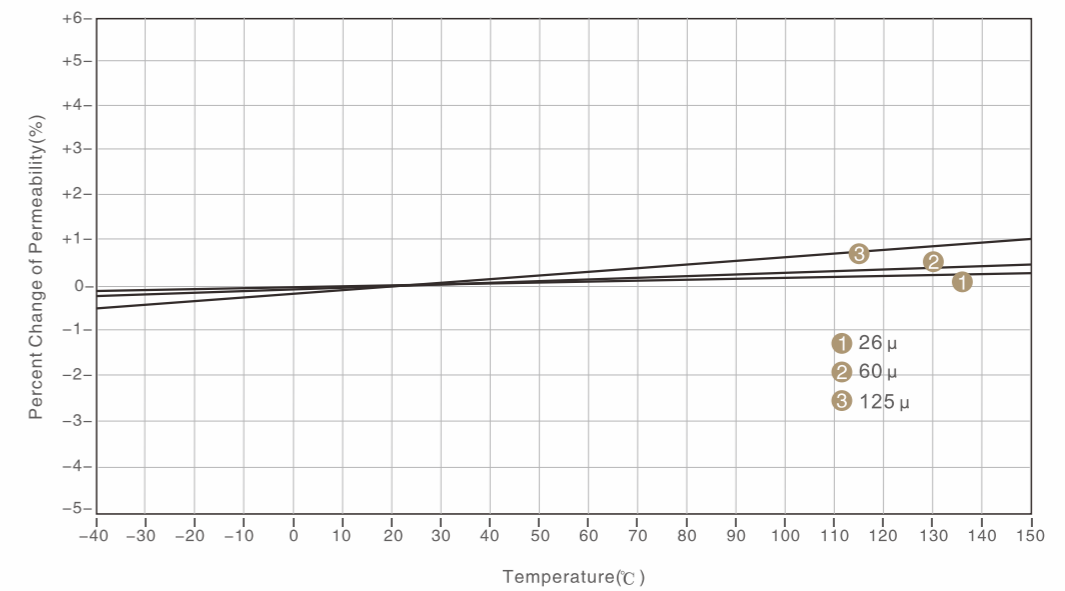
● Normal Magnetization Curves
标准磁化曲线



● Permeability vs. Frequency
磁导率与频率关系曲线



● Temperature Stability
磁导率百分率与温度关系曲线



Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KM050-026A	26	12	1.229 /3.120	0.0177 /0.114	0.022 /0.356	0.0594 /0.383	12.70×7.62×4.75	13.46×6.99×5.51
KM050-060A	60	27						
KM050-125A	125	56						
KM065-026A	26	15	1.619 /4.110	0.0298 /0.192	0.048 /0.789	0.1105 /0.713	16.50×10.20×6.35	17.40×9.53×7.11
KM065-060A	60	35						
KM065-125A	125	72						
KM068-026A	26	19	1.630 /4.140	0.0360 /0.232	0.059 /0.960	0.0990 /0.638	17.30×9.65×6.35	18.03×9.02×7.11
KM068-060A	60	43						
KM068-125A	125	89						
KM080-026A	26	14	2.010 /5.090	0.0350 /0.226	0.070 /1.150	0.1772 /1.140	20.30×12.70×6.35	21.10×12.07×7.11
KM080-060A	60	32						
KM080-125A	125	68						
KM090-026A	26	19	2.230 /5.670	0.0513 /0.331	0.114 /1.880	0.2181 /1.410	22.90×14.07×7.62	23.62×13.39×8.38
KM090-060A	60	43						
KM090-125A	125	90						
KM092-026A	26	22	2.320 /5.880	0.0610 /0.388	0.142 /2.280	0.2307 /1.490	23.60×14.40×8.89	24.30×13.77×9.70
KM092-060A	60	51						
KM092-125A	125	105						
KM106-026A	26	32	2.500 /6.350	0.1014 /0.654	0.254 /4.150	0.2419 /1.560	26.90×14.70×11.20	27.70×14.10×11.99
KM106-060A	60	75						
KM106-125A	125	157						
KM107-026A	26	22	2.501 /6.352	0.0770 /0.497	0.198 /3.155	0.2419 /1.561	26.90×14.70×8.64	27.70×14.10×9.45
KM107-060A	60	59						
KM107-125A	125	123						
KM130-026A	26	28	3.210 /8.150	0.1042 /0.672	0.334 /5.480	0.4537 /2.930	33.00×19.90×10.70	33.83×19.30×11.61
KM130-060A	60	61						
KM130-125A	125	127						
KM131-026A	26	22	3.207 /8.147	0.0854 /0.551	0.274 /4.490	0.4537 /2.927	33.00×19.90×8.76	33.83×19.30×9.70
KM131-060A	60	51						
KM131-125A	125	109						

Part Number	Perm. (μ)	AL ±8%	ℓ _c in/cm	A _e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KM132-026A	26	28	3.207 /8.147	0.1082 /0.698	0.347 /5.687	0.4537 /2.927	33.00×19.90×11.18	33.83×19.30×11.99
KM132-060A	60	65						
KM132-125A	125	135						
KM135-026A	26	16	3.530 /8.950	0.0704 /0.454	0.249 /4.060	0.6193 /4.010	34.30×23.40×8.89	35.10×22.56×9.83
KM135-060A	60	38						
KM135-125A	125	79						
KM141-026A	26	24	3.540 /8.980	0.1051 /0.678	0.372 /6.088	0.5648 /3.640	35.80×22.40×10.50	36.63×21.54×11.28
KM141-060A	60	56						
KM141-125A	125	117						
KM157-026A	26	35	3.880 /9.840	0.1662 /1.072	0.645 /10.500	0.6619 /4.270	39.90×24.10×14.50	40.72×23.30×15.37
KM157-060A	60	81						
KM157-125A	125	168						
KM158-026A	26	53	0.374 /9.510	0.060 /1.537	0.592 /15.043	0.5500 /3.550	40.13×22.08×17.00	40.94×21.27×17.89
KM158-060A	60	122						
KM158-125A	125	254						
KM168-026A	26	47	4.040 /10.216	0.229 /1.475	0.960 /15.741	0.5648 /3.644	42.90×24.20×16.26	44.00×23.30×17.16
KM168-060A	60	108						
KM168-125A	125	224						
KM184-026A	26	59	4.230 /10.740	0.308 /1.990	1.300 /21.300	0.6619 /4.270	46.70×24.10×18.00	47.63×23.32×18.92
KM184-060A	60	135						
KM184-125A	125	281						
KM185-026A	26	37	4.580 /11.630	0.208 /1.340	0.953 /15.530	0.6469 /6.110	46.70×28.70×15.20	47.63×27.89×16.13
KM185-060A	60	86						
KM185-125A	125	178						
KM200-026A	26	32	5.020 /12.730	0.194 /1.251	0.974 /15.930	1.165 /7.500	50.80×31.80×13.50	51.69×30.94×14.35
KM200-060A	60	73						
KM200-125A	125	152						
KM225-026A	26	33	5.630 /14.300	0.224 /1.444	12.260 /20.650	1.470 /9.480	57.20×35.60×14.00	58.00×34.70×14.86
KM225-060A	60	75						
KM225-125A	125	156						

Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KM226-026A	26	60	4.930 /12.500	0.355 /2.290	1.750 /28.600	0.796 /5.140	57.20×26.40×15.20	58.00×25.60×16.10
KM226-060A	60	138						
KM226-125A	125	287						
KM250-026A	26	83	5.660 /14.370	0.570 /3.675	3.223 /52.810	1.198 /7.730	62.00×32.60×25.00	63.10×31.37×26.27
KM250-060A	60	192						
KM250-125A	125	400						
KM268-026A	26	62	6.429 /16.330	0.481 /3.104	3.093 /50.690	1.491 /9.620	68.00×36.00×20.00	69.40×34.70×21.40
KM268-060A	60	143						
KM268-125A	125	298						
KM290-026A	26	89	7.24 /18.380	0.781 /5.040	5.653 /92.640	2.364 /15.250	74.80×45.30×35.00	75.20×44.07×36.27
KM290-060A	60	206						
KM290-125A	125	429						
KM300-026A	26	30	7.72 /20.000	0.274 /1.770	2.115 /34.700	2.800 /17.990	77.80×49.20×12.70	78.90×48.20×13.84
KM300-060A	60	68						
KM300-125A	125	142						
KM301-026A	26	37	7.86 /19.950	0.352 /2.270	2.770 /45.300	2.800 /17.990	77.80×49.20×15.90	78.90×48.20×17.02
KM301-060A	60	85						
KM301-125A	125	178						
KM400-026A	26	48	9.56 /24.271	0.546 /3.523	5.217 /85.495	3.784 /24.413	101.60×57.15×16.51	103.12×55.75×17.78
KM400-060A	60	112						
KM400-125A	125	228						
KM401-026A	26	40	9.56 /24.271	0.461 /2.972	4.401 /72.122	3.784 /24.413	101.60×57.15×13.59	103.12×55.75×14.86
KM401-060A	60	92						
KM401-125A	125	192						
KM520-026A	26	54	12.77 /32.428	0.829 /5.347	10.580 /173.400	7.225 /46.612	132.54×78.59×20.32	133.96×77.04×21.72
KM520-060A	60	124						
KM520-125A	125	259						
KM521-026A	26	67.6	12.77 /32.429	1.040 /6.710	13.280 /217.580	7.225 /46.612	132.54×78.59×25.40	133.96×77.04×26.80
KM521-060A	60	156						
KM521-125A	125	325						

Part Number	Perm. (μ)	AL $\pm 8\%$	l_c in/cm	A_e in ² /cm ²	V in ³ /cm ³	W in ² /cm ²	Dimensions (mm)	
							OD (max) × ID (min) × HT (max)	
							Before Coating	After Coating
KM650-026A	26	160	15.22 /38.650	2.932 /18.920	44.620 /731.260	9.190 /59.310	165.00×88.90×50.80	167.20×86.90×52.90
KM650-060A	60	368						
KM651-026A	26	78	16.22 /41.200	1.529 /9.870	63.085 /407.000	12.440 /80.300	165.00×102.40×31.75	166.50×101.00×33.15
KM651-060A	60	180						

特殊形状磁粉芯

Special Shape Cores

东睦科达能提供各种几何形状的磁粉芯，包括环形、E/EQ形、U形、块状等。同时，可根据客户需求提供定制化设计。

KDM Powder Cores are available in a variety of geometries including toroid, E/EQ shape, U shape, block shape and so on. Meanwhile, customized designs may be available upon request.

E Cores

HC Cores

EQ Cores

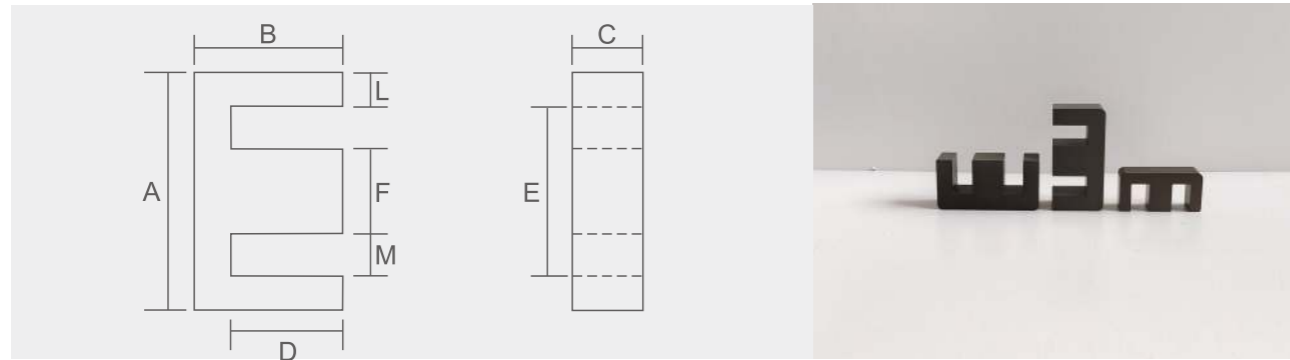
U Cores

Block Cores

Ellipse Cores

Cylinder Cores





SF 43 17 E -060

Permeability:60 μ

E Cores

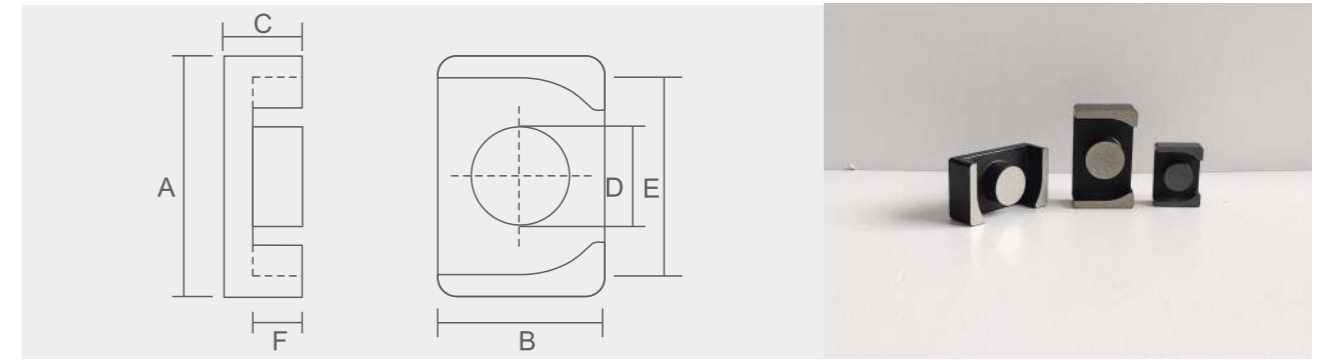
Width:17mm

Length:43mm

SF:Si-Fe S:Sendust H:High Flux

Part Number	Dimensions (mm)								Path Length (cm)	Cross Section Area (cm ²)	Volume (cm ³)	A _L (nH/N ²)±8%			
	A	B	C	D _(min)	E _(min)	F	L _(nom)	M _(min)				026 μ	040 μ	060 μ	090 μ
S2510E	25.4	9.6	6.53	6.22	18.8	6.22	3.17	6.25	4.85	0.385	1.87	39	52	70	100
S3007E	30.4	15.01	7.06	9.7	19.5	6.96	5.11	6.46	6.56	0.601	3.94	33	46	71	92
S3515E	34.54	14.1	9.35	9.65	25.3	9.32	4.45	7.87	6.94	0.840	5.83	56	75	102	146
S4317E	40.9	16.5	12.5	10.4	28.3	12.5	6.0	7.9	7.75	1.520	11.8	88	119	163	234
S4017E	42.8	21.1	10.8	15.0	30.4	11.9	5.95	9.27	9.84	1.280	12.6	56	76	105	151
S4020E	42.8	21.1	15.4	15.0	30.4	11.9	5.95	9.27	9.84	1.830	18.0	80	108	150	217
S4022E	42.8	21.1	20.0	15.0	30.4	11.9	5.95	9.27	9.84	2.370	23.3	104	140	194	281
S5528E	54.9	27.6	20.6	18.5	37.5	16.8	8.38	10.3	12.30	3.500	43.1	116	157	219	
S5530E	54.9	27.6	24.6	18.5	37.5	16.8	8.38	10.3	12.30	4.170	51.4	138	187	261	
S6527E	65.1	32.5	27.0	22.2	44.2	19.7	10.0	12.1	14.70	5.400	79.4	162	230	300	
S7228E	72.39	27.94	19.05	17.78	52.63	19.05	9.52	16.89	13.70	3.680	50.3	130	173	236	
S8020E	80.01	38.1	19.81	28.14	59.28	19.81	9.91	19.81	18.50	3.890	72.1	103	145	190	

※ Customized designs are available.
 可提供客制化定制
 Materials: SF(Si-Fe⁺), S (Sendust),H(High Flux), KAM(Nanodust⁺)and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等



S 32 22 HC -E10.3 -060

Permeability:60 μ

Height OF HC core

HC Cores

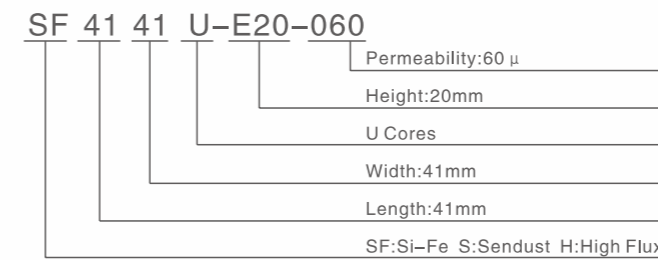
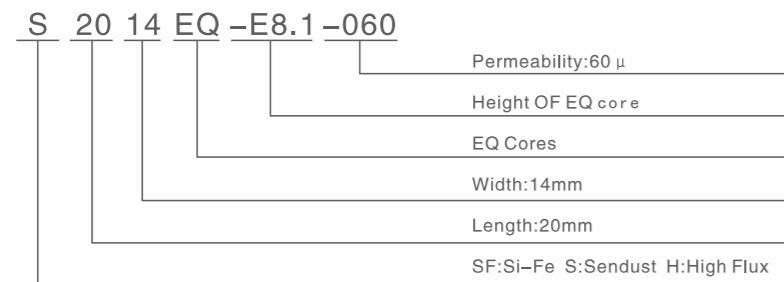
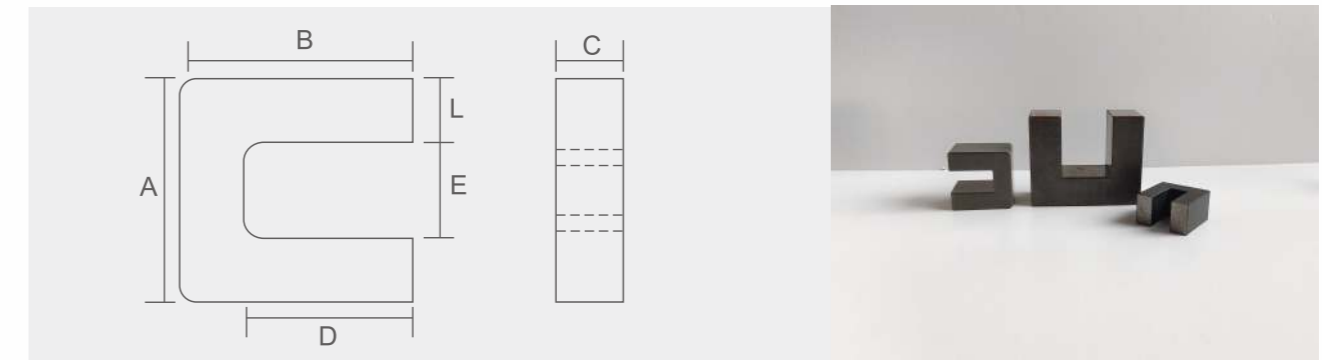
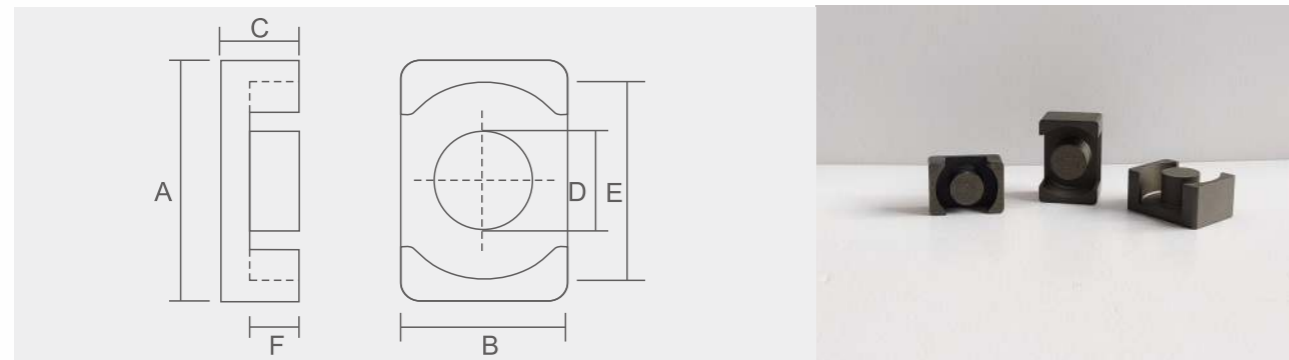
Width:22mm

Length:32mm

SF:Si-Fe S:Sendust H:High Flux

Part Number	Dimensions (mm)						Path Length (cm)	Cross Section Area (cm ²)	Volume (cm ³)	A _L (nH/N ²)±12%		
	A	B	C	D	E	F				026 μ	040 μ	060 μ
S2314HC-E8.7	23.4	14.0	8.7	9.2	19.4	6.2	11.8	4.91	0.670	45	69	103
S2518HC-E8.4	25.0	18.0	8.4	11.0	21.0	5.4	17.1	4.97	0.960	63	97	146
S2518HC-E10.8	25.0	18.0	10.8	11.0	21.0	7.8	20.4	5.93	0.960	53	81	122
S3020HC-E9.2	30.0	20.0	9.2	12.0	25.6	5.9	23.7	5.81	1.140	64	99	148
S3020HC-E11.8	30.0	20.0	11.8	12.0	25.6	8.5	27.9	6.85	1.140	54	84	125
S3222HC-E10.3	32.0	22.0	10.3	13.5	27.0	6.6	32.0	6.25	1.430	75	115	172
S3222HC-E13.4	32.0	22.0	13.4	13.5	27.0	9.7	38.2	7.49	1.430	62	94	144
S3222HC-E15.2	32.0	22.0	15.2	13.5	27.0	11.5	42.0	8.21	1.430	57	88	131
S3624HC-E11.2	36.2	24.0	11.2	15.0	30.4	7.2	43.0	6.78	1.770	85	131	197
S3624HC-E14.4	36.2	24.0	14.4	15.0	30.4	10.4	51.1	8.06	1.770	72	110	166
S4225HC-E12.3	42.0	25.0	12.3	16.2	35.2	7.9	56.1	7.61	2.060	88	136	204
S4225HC-E15.8	42.0	25.0	15.8	16.2	35.2	11.4	66.4	9.01	2.060	75	115	172

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 可提供客制化定制
 Materials: SF(Si-Fe⁺), S (Sendust),H(High Flux), KAM(Nanodust⁺)and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等

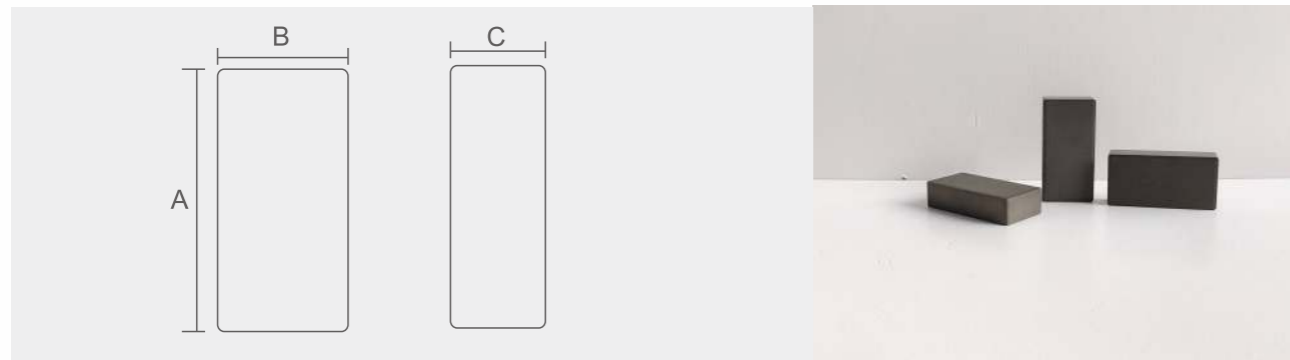


Part Number	Dimensions (mm)						Path Length (cm)	Cross Section Area (cm ²)	Volume (cm ³)	A _L (nH/N ²)±12%		
	A	B	C	D	E	F				026μ	040μ	060μ
S2014EQ-E8.1	20.5	14.0	8.1	8.8	18.0	5.7	4.52	0.608	2.75	44	68	101
S2014EQ-E10.1	20.5	14.0	10.0	8.8	18.0	7.7	5.32	0.608	3.23	37	57	85
S2619EQ-E10.1	26.5	19.0	10.1	12.0	22.6	6.8	5.47	1.198	6.55	72	110	165
S2619EQ-E12.4	26.5	19.0	12.4	12.0	22.6	9.1	6.39	1.198	7.66	61	94	141
S3222EQ-E10.3	32.0	22.0	10.3	13.5	27.6	6.6	6.03	1.523	9.18	83	127	190
S3222EQ-E15.2	32.0	22.0	15.2	13.5	27.6	11.5	7.99	1.523	12.17	62	96	144
S3626EQ-E17.4	36.0	26.0	17.4	14.4	32.0	13.4	9.47	1.808	17.12	62	96	144
S4128EQ-E19.9	41.5	28.0	19.9	14.9	36.5	15.4	11.52	1.997	2301	57	87	131
S5032EQ-E25	50.0	32.0	25.0	20.0	44.0	19.5	13.34	3.141	41.90	77	118	178
S6542EQ-E30	65.0	42.0	30.0	26.0	57.2	22.8	16.53	5.309	87.76	105	161	242

Part Number	Dimensions (mm)						Path Length (cm)	Cross Section Area (cm ²)	Volume (cm ³)	A _L (nH/N ²)±12%		
	A	B	C	D	E	L				026μ	040μ	060μ
SF3536U-E20	35.0	36.0	20.0	25.0	13.0	11.0	16.90	2.200	37.18	43	65	98
SF3536U-E25	35.0	36.0	25.0	25.0	13.0	11.0	16.90	2.750	46.48	53	82	123
SF4141U-E20	41.0	41.0	20.0	28.0	15.0	13.0	19.30	2.600	50.18	44	68	102
SF4141U-E25	41.0	41.0	25.0	28.0	15.0	13.0	19.30	3.250	62.73	55	85	127
SF4141U-E30	41.0	41.0	30.0	28.0	15.0	13.0	19.30	3.900	75.27	66	102	152
SF5251U-E25	52.0	51.0	25.0	35.0	20.0	16.0	24.30	4.000	97.20	54	83	124
SF5251U-E30	52.0	51.0	30.0	35.0	20.0	16.0	24.30	4.800	116.6	65	99	149
SF6361U-E30	63.0	60.5	30.0	41.5	25.0	19.0	29.10	5.700	165.9	64	98	148
SF6361U-E35	63.0	60.5	35.0	41.5	25.0	19.0	29.10	6.650	193.5	75	115	172
SF7965U-E30	79.0	64.5	30.0	42.5	35.0	22.0	32.60	6.600	215.2	66	102	153
SF7965U-E35	79.0	64.5	35.0	42.5	35.0	22.0	32.60	7.700	251.0	77	119	178

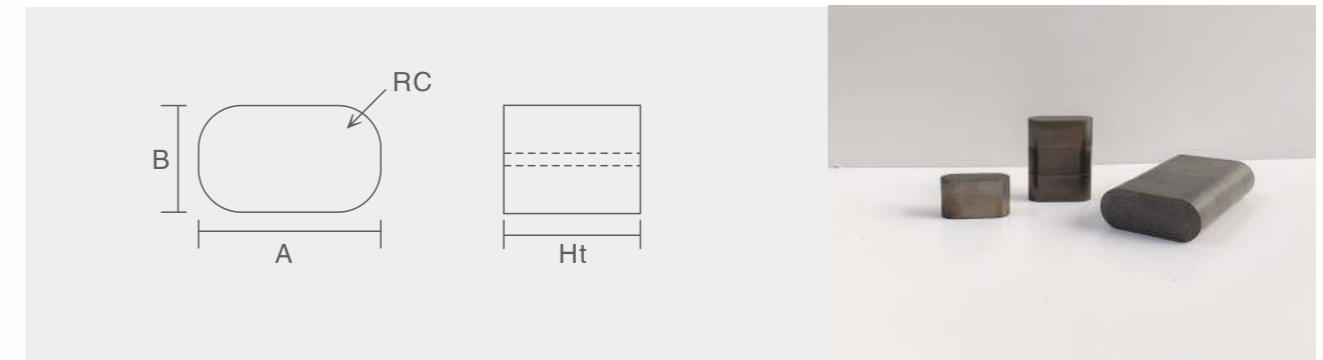
※ Customized designs are available.
 可提供客制化定制
 Materials: SF(Si-Fe*), S (Sendust),H(High Flux), KAM(Nanodust*)and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等

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 Materials: SF(Si-Fe*), S (Sendust),H(High Flux), KAM(Nanodust*)and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等



SF 70 30 B-E20-060

Permeability:60 μ
 Height:20mm
 Block Cores
 Width:30mm
 Length:70mm
 SF:Si-Fe S:Sendust H:High Flux



SF 35 20 L-E20-060

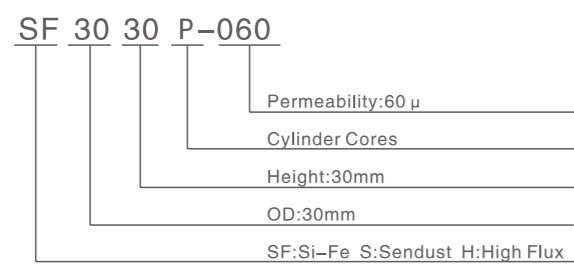
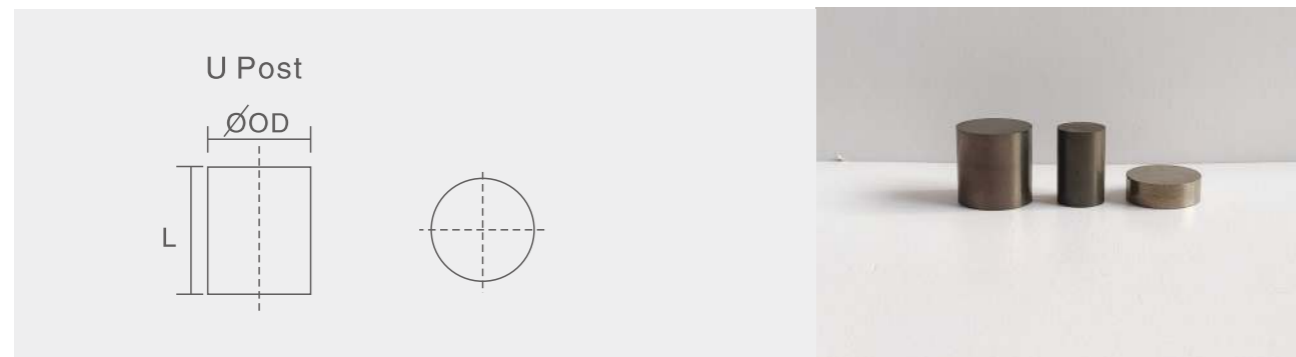
Permeability:60 μ
 Height:20mm
 Ellipse Cores
 Width:20mm
 Length:35mm
 SF:Si-Fe S:Sendust H:High Flux

Part Number	Dimensions (mm)		
	A	B	C
SF5030B-E15	50.5	30.3	15
SF5030B-E20			20
SF6030B-E15	60.5	30.3	15
SF6030B-E20			20
SF7030B-E15	70.5	30.3	15
SF7030B-E20			20
SF8030B-E15	80.5	30.3	15
SF8030B-E20			20
SF5530B-E12	55.0	30.0	12
SF5530B-E15			15
SF5540B-E12	55.0	40.0	12
SF5540B-E15			15

Part Number	Dimensions			
	A _(mm)	B _(mm)	RC _(mm)	Ht _(mm)
SF3515L-E20	35	15	7.5	20
SF3515L-E25	35	15	7.5	25
SF3520L-E20	35	20	7.5	20
SF3520L-E25	35	20	7.5	25
SF5020L-E20	50	20	10	20.25
SF5035L-E13	50	35	7.5	13.5
SF5035L-E18	50	35	7.5	18.5
SF5528L-E10	55	28	14	10
SF6030L-E14	60	30	15	14
SF6034L-E10	60	34	17	10
SF6035L-E13	60	35	7.5	13.5
SF6035L-E18	60	35	7.5	18.5
SF6550L-E21	65	50	5	21
SF6637L-E11	66	37	18.5	11
SF6842L-E8	68	42	21	8.5
SF7035L-E13	70	35	7.5	13.5
SF7035L-E18	70	35	7.5	18.5
SF7040L-E12	70	40	20	12
SF8030L-E23	80	30	15	23.5
SF8430L-E15	84	30	15	20
SF9055L-E15	90	55	27.5	15

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 可提供客制化定制
 Materials: SF(Si-Fe⁺), S (Sendust),H(High Flux), KAM(Nanodust⁺) and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等

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 可提供客制化定制
 Materials: SF(Si-Fe⁺), S (Sendust),H(High Flux), KAM(Nanodust⁺) and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等



Part Number	Dimensions	
	OD _(mm)	L _(mm)
SF1030P	10	30
SF1430P	14	30
SF1930P	19	30
SF2020P	20	20
SF2021P	20	21
SF2130P	21	30
SF2338P	23	38
SF2424P	24	24
SF2520P	25	20
SF2525P	25	25
SF2532P	25	32
SF2728P	27.5	28
SF2828P	28	28
SF3030P	30	30
SF3035P	30	35
SF3225P	32	25
SF3328P	33	28
SF3631P	36	31
SF4020P	40	20
SF5530P	55	30
SF6030P	60	30
SF7030P	70	30

※ Customized designs are available.
 可提供客制化定制
 Materials: SF(Si-Fe⁺), S (Sendust), H(High Flux), KAM(Nanodust⁺) and etc.
 材质: 铁硅、铁硅铝、铁镍、纳米复合材料等

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基础知识

Basic Knowledge

特点与分类
Classification and Characteristics
of Magnetic Materials

术语与公式
Formulas and Glossary

电感器设计注意事项
Notes on Inductor Designs

软磁材料的主要分类

(1) **铁氧体软磁材料**：是一系列含有氧化铁的复合氧化物材料（或称为陶瓷材料），特点是饱和磁感应强度低（0.5T以下）但磁导率比较高电阻率也很高，一般使用在高频下。如锰锌铁氧体（Mn-Zn Cores）、镍锌铁氧体(Ni-Zn Cores)、镁锌铁氧体(Mg-Zn Cores)。

(2) **金属软磁材料**：与铁氧体软磁材料相比具有高的饱和磁感应强度低的矫顽力。主要有铁系类软磁如工业纯铁、铁粉芯(Iron PowderCores)；铁镍合金类软磁，如铁镍钼磁粉芯(MPP Cores)、高磁通铁镍磁粉芯(High Flux Cores)等；铁硅合金类软磁，如铁硅铝磁粉芯(Sendust Cores)、硅钢片等。

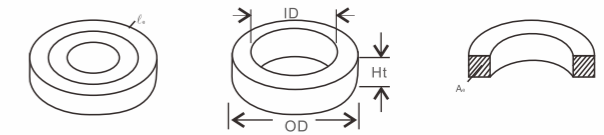
(3) **非晶软磁材料和纳米晶软磁材料**：是20世纪后期发展起来的新软磁材料。

金属磁粉芯的主要特点

金属磁粉芯是由金属磁性粉粒，经表面绝缘包覆，与绝缘介质（有机或无机类黏合剂）混合压制而成的一种软磁材料。由于金属磁性粉粒很小，又被非磁性绝缘膜物质隔开，因此，一方面可以隔绝涡流，材料适用与较高频率，另一方面由于颗粒之间的间隙效应，导致材料具有低磁导率及恒磁特性。同时磁粉芯内有天然的气隙分布特性，极其适合储能性电感器的使用，又由于磁性粉末颗粒尺寸小，基本上不会发生集肤效应，磁导率随频率的变化也就较为稳定。磁粉芯的磁电性能主要取决于粉粒材料的磁导率、颗粒大小和形状、它们的填充系数、绝缘介的含量、成型压力及热处理工艺等。

本样本说明书主要介绍的是合金磁粉芯:铁硅铝磁粉芯(Sendust Cores)、铁镍磁粉芯(High Flux Cores)、铁镍钼磁粉芯(MPP Cores)、硅铁磁粉芯(Si-Fe® Cores)以及KDM首创纳米复合磁粉芯(Nanodust® Cores)和超级铁硅铝(KS-HF Cores)铁硅镍磁粉芯(Neu Flux® Cores)。除了以上产品，KDM还生产铁粉芯系列，如有需要请向我们索取相关资料Issue L2015。

磁粉芯的有效面积与有效磁路长度



$$A_e = \frac{OD-ID}{2} \times Ht$$

$$\ell_e = \frac{OD-ID}{\ln\left(\frac{OD}{ID}\right)} \times \pi$$

$$V = \ell_e \times A_e$$

A_e : 有效磁粉芯面积 (cm²)与磁芯的横截面积相等

ℓ_e : 有效磁路长度或称平均磁路长度 (cm)

V: 磁芯体积 (cm³)

OD: 磁芯外径 (mm)

Ht: 磁芯高度 (mm)

W: 磁芯最小窗口面积 (cm²)

1英寸 (inches) = 10³ mil=25.4mm

ID: 磁芯内径 (mm)

电感量和额定电感量

每种尺寸磁粉芯的额定电流量都与其有效磁导率有关，有效磁导率仅作参考，环型磁芯的电感测试是依均匀分布的单层绕组作测试依据，以非均匀分布而少圈数的磁芯作测试会产生比预期要大的电感读数。

铁粉芯 (Iron Powder Cores) 的额定电感量均在10kHz的频率下及10高斯 (1mT) 的AC磁通密度峰值为测试依据。

合金磁粉芯的电感系数值是以1000圈时为测试依据，其中电感系数偏差通常在±8%之间。

$$L = \frac{4\pi \mu_e A_e}{\ell_e} \times N^2$$

$$A_L = \frac{L}{N^2}$$

L: 电感量 (H) 1H=10³mH=10⁶μH=10⁹nH
 AL: 额定电感量 (nH/N²)
 μ_e : 有效磁导率
 A_e : 有效磁芯截面积
 ℓ_e : 有效磁路长度
 N: 线圈匝数

磁场强度和安培定律

安培定律揭示了磁场强度 (H) 与电流、圈数和磁路长度之间的关系。

$$H = \frac{0.4 \pi NI}{\ell}$$

H: 磁场强度 (Oersteds)

N: 圈数

I: 电流 (A)

ℓ : 磁路长度 (cm)

根据安培定律，磁场的强度在靠近磁粉芯内位置强（因为磁路长度 ℓ 短），引入有效磁路长度 (ℓ_e) 可以提供穿过磁粉芯整个截面上磁场强度平均值 (Haverage)

$$H_{average} = \frac{0.4 \pi NI}{\ell_e}$$

Haverage: 穿过磁粉芯 (从内径到外径) 整个截面的平均值磁场强度 (Oersteds)
 N: 圈数
 ℓ_e : 有效磁路长度或称平均磁路长度 (cm)
 I: 电流 (A)

除非另有说明，在本样本中使用的都是平均磁路长度及平均磁场强度

有效磁导率

$$\mu_e = \frac{B}{H}$$

μ_e : 有效磁导率 (无量纲)
 B: 磁通量密度 (高斯 Gauss)
 H: 磁场强度 (奥斯特 Oe)

直流绕线电阻(Rdc)的计算公式

$$R_{dc} = \frac{\ell_w N r}{1200}$$

ℓ_w : 平均绕线长度 (英寸)
 N: 圈数
 r: 线的电阻 (Ω/1000英尺)

除了绕线中的标准直流电阻外, 还存在着由于交流电流趋肤效应而产生的绕线电阻增量, 其之间关系式如下:

$$\frac{R_{ac}}{R_{dc}} = 0.96 + 0.0035x^2 - 0.00038x^3$$

$$X = d \sqrt{\frac{f}{1 + 0.00393(\text{°C} - 20)}}$$

d: 线径 (英寸)
 f: 频率 (Hz)
 °C: 工作温度

Q值 (品质因数)

Q值是指电感器电抗与有效电阻的比值, 它反映了该电感的质量。对于电源滤波器而言, Q值提高就意味着截止更快, 衰减比更高和谐振效果更好, Q值的大小主要由电感线圈的分布电容所决定。

如果忽略分布电容引起的自谐振效果, 可以用以下公式计算电感器Q值。

$$Q = \frac{\omega L}{R_{dc} + R_{ac} + R_{cd}}$$

Q: 品质因数
 L: 电感量 (H)
 ω : $2\pi f$ (Hz)
 R_{dc}: 绕线直流电阻 (Ω)
 R_{ac}: 由于磁粉芯损耗而产生的阻抗 (Ω)
 R_{cd}: 由于绕线中介电损耗而产生的阻抗 (Ω)

磁通密度和法拉第定律

磁通密度的大小影响磁粉芯的损耗值和磁导率。除非另有说明, 本样本中所列举的数据都是基于正弦波形和最大磁通密度 (峰值) 得出的。

$$B_{pk} = \frac{E_{rms} 10^8}{4.44 f A_e N}$$

B_{pk} : 最大磁通密度峰值 (高斯 Gauss)
 E_{rms} : 通过绕线正弦电压有效值 (Volts)
 N: 圈数
 A_e : 有效磁粉芯截面积 (cm²)
 f: 正弦波形电压频率 (Hz)

B_{pk} 指穿过磁粉芯横截面各部份平均磁通密度值的最大值。事实上, 通过磁粉芯内径附近的磁通密度值高, 而磁粉芯外径附近的磁通密度值低。

$$1 \text{ 特斯拉 (T)} = 10^4 \text{ 高斯 (Gauss)} = 10^3 \text{ mT}$$

绕线介电损耗 (Rcd) 的计算公式

$$R_{cd} = d \omega^3 L^2 C_d$$

d: 分布电容的功率因数
 ω : $2\pi f$ (Hz)
 L: 电感量 (H)
 C_d: 分布电容 (法拉)

磁芯损耗 (Core Loss)

磁芯损耗是磁芯材料内交替磁场引致的结果。磁芯损耗有三部分组成: 磁滞损耗、剩磁损耗和涡流损耗。

$$\frac{R_{ac}}{\mu_e L} = a B_{pk}^n f + c f + e f^2$$

R_{ac}: 有磁芯损耗产生的有效电阻 (Ω)
 μ_e : 有效磁导率
 L: 电感量 (H)
 a: 磁滞损耗系数
 B_{pk} : AC磁通密度峰值 (高斯 Gauss)
 C: 剩磁损耗系数
 F: 频率 (Hz)
 e: 涡流损耗系数

在高温条件下, 涡流损耗是主要损耗, 而低频下磁滞损耗则是主要损耗。而各种损耗形式在总损耗中所占的比例也会受到磁通密度的影响, 受到高温热老化影响的是磁芯损耗中的涡流部份。

电感器设计注意事项

电感器的频率特性主要由三个因数影响

- A、磁芯材料损耗的影响是主要的，它导致Q值从最大值后呈现负斜率。
 B、介电损耗也是影响的因素，特别是在高频段尤为明显。
 C、第三个影响因素就是分布电容和电感的自谐振效应。

自谐振频率对电感器的性能起负面影响，自谐振频率是有分布电容和自感所决定，而分布电容是由绕线方法所决定的。尽量减少分布电容式绕线设计中非常重要的考虑成本。对于环型磁粉芯的绕线，它的有效电容式与电感并联的。这个分布电容是线与线之间，层与层之间和绕线本身与磁粉芯之间的电容之和。

好的绕线设计技术就是要尽量缩小圈数之间的电压，力求尽量减少分布电容。比如将绕线划分成几组，或者使用绕线排更可以有效减少电容量。在绕线和内部分段连接技术中，应尽量避免使用输入端与输出端靠的太近，因为在这两个部位具有圈与圈间最大的势能，并因此而分布最大的有效电容值。同时，湿度指标和灌封与封装材料的绝缘常数也会提高分布电容值。

对于精密绕线磁芯，要求时间稳定性高和温度重复性好。所以在其温度周期内，必须让线绕应力得到释放。在磁粉芯是绕制完的线圈必须要做尽量多的从室温到125℃的温度循环，这个温度循环不仅仅只是为了释放应力，而且还有去除湿度的作用，当完成温度循环后，必须要对电感器进行电感量的最后调整。

绕线后磁芯必须保持干燥，尽快浸封，灌封或密封起来，应仔细选择灌封化合物材料，以避免有些材料随时间和温度收缩，而影响稳定性。在绕线后磁芯外面加上一些垫衬材料可以改善这种影响。

对于设计工程师而言，了解热老化引起磁芯损耗增加条件是十分重要。在高温条件下，涡流损耗是主要损耗，而低频下，磁滞损耗则是主要损耗。而各种损耗形式在总损耗中所占的比例也会受到磁通密度的影响。受到高温热老化影响是磁芯损耗的涡流部分。

在铁氧体磁芯内采用开气隙的方式，可降低磁芯的有效磁导率，从而降低工作的磁通密度，但这种气隙可以造成严重的局部化气隙损耗问题，当频率高于100kHz时，尤其显著，在很多的例子里，气隙损耗都会超过磁芯损耗，由于磁粉芯的气隙是均匀分布的，所以这类局部化气隙基本上是不存在的。

如果选用任何不适当的磁芯材料或小于指定尺寸的磁芯，磁芯会因为进行过高频率的磁芯损耗而产生温升，从而更可能导致热衰败。

在选择合适的磁芯材料前，必须确定电感器摆动的重要性。选取原则是保证磁粉芯不被磁饱和为前提。

判断磁粉芯温度的“过热点”的最佳方法是在磁芯打一个小的盲孔。并插入温差电偶丝。要求电偶丝与磁芯紧密接触才能得到精确结果，必须严密注意通风死角的温度情况，因为这些死角处的温度比冷风通道处的温度要高。建议单元组件在最恶劣条件下运行4-8小时，或运行到电感器达到热平衡为止。这样才能获得真正的磁粉芯的最高温度。要注意磁粉芯有不同的导热系数，会形成温度分级情况。

磁粉芯的原料磁粉有磁力格化现象，即是说当磁粉被磁化时，它们尺寸会发生轻微的变化，此情况在可听频率>20kHz以上应用中无关紧要，但在某些50Hz的用途中，磁芯会有蜂鸣噪音出现，这种情况在E型磁芯比在环型磁芯更明显，也会随着交流磁通密度的变化而改变。

AWG Wire No.	Bare Area		Resistivity 10 ⁶ Ω cm at 20°C	Heavy Synthetics			Current Capacity Amps (listed by columns of amps/cm ²)					
	cm ² (x10 ⁻³)	Cir-Mil		Area		Weight gm/cm	200	400	600	800		
				cm ² (x10 ⁻³)	Cir-Mil						cm	inch
10	53.61	10384	32.70	55.9	11046	0.267	0.1051	0.468	10.4	20.8	31.2	41.6
11	41.68	8226	41.37	44.5	8798	0.238	0.0938	0.3750	8.23	16.4	24.6	32.8
12	33.08	6529	52.09	35.64	7022	0.213	0.0838	0.2977	6.53	13.06	19.6	26.1
13	26.26	5184	65.64	28.36	5610	0.190	0.0749	0.2367	5.18	10.4	15.5	20.8

14	20.82	4109	28.80	22.95	4556	0.171	0.0675	0.1879	4.11	8.22	12.3	16.4
15	16.51	3260	104.3	18.37	3624	0.153	0.0602	0.1492	3.26	6.52	9.78	13.0
16	13.07	2581	131.8	14.73	2905	0.137	0.0539	0.1184	2.58	5.16	7.74	10.3
17	10.39	2052	165.8	11.68	2323	0.122	0.0482	0.0943	2.05	4.10	6.15	8.20

18	8.228	1624	209.5	9.326	1857	0.109	0.0431	0.07472	1.62	3.25	4.88	6.50
19	6.531	1289	263.9	7.539	1490	0.0980	0.0386	0.05940	1.29	2.58	3.87	5.16
20	5.188	1024	332.3	6.065	1197	0.0879	0.0346	0.04726	1.02	2.05	3.08	4.10
21	4.116	812.3	418.9	4.837	954.8	0.0785	0.0309	0.03757	0.812	1.63	2.44	3.25

22	3.243	640.1	531.4	3.857	761.7	0.0701	0.0276	0.02965	0.640	1.28	1.92	2.56
23	2.588	510.8	666.0	3.135	620.0	0.0632	0.0249	0.02372	0.511	1.02	1.53	2.04
24	2.047	404.0	842.1	2.514	497.3	0.0566	0.0223	0.01884	0.404	0.808	1.21	1.62
25	1.623	320.4	1062.0	2.002	396.0	0.0505	0.0199	0.01498	0.320	0.641	0.962	1.28

26	1.280	252.8	1345.0	1.603	316.8	0.0452	0.0178	0.01185	0.253	0.506	0.759	1.01
27	10.21	201.6	1687.6	1.313	259.2	0.0409	0.0161	0.00945	0.202	0.403	0.604	0.806
28	0.8046	158.8	2142.7	1.0515	207.3	0.0366	0.0144	0.00747	0.159	0.318	0.477	0.636
29	0.6470	127.7	2664.3	0.8548	169.0	0.0330	0.0130	0.00602	0.128	0.255	0.382	0.510

30	0.5067	100.0	3402.2	0.6785	134.5	0.0294	0.0116	0.00472	0.100	0.200	0.300	0.400
31	0.4013	79.21	4294.6	0.5595	110.2	0.0267	0.0105	0.00372	0.0792	0.158	0.237	0.316
32	0.3242	64.00	5314.9	0.4559	90.25	0.0241	0.0095	0.00305	0.0640	0.128	0.192	0.252
33	0.2554	50.41	6748.6	0.3662	72.25	0.0216	0.0085	0.00214	0.0504	0.101	0.152	0.202

34	0.2011	39.69	8572.8	0.2863	56.25	0.0191	0.0075	0.00189	0.0397	0.0794	0.119	0.159
35	0.1589	31.36	10849	0.2268	44.89	0.0170	0.0067	0.00150	0.0314	0.0627	0.0940	0.125
36	0.1266	25.00	13608	0.1813	36.00	0.0152	0.0060	0.00119	0.0250	0.0500	0.0750	0.100
37	0.1026	20.25	16801	0.1538	30.25	0.0140	0.0055	0.000977	0.0203	0.0405	0.0608	0.0810

38	0.08107	16.00	21266	0.1207	24.01	0.0124	0.0049	0.000773	0.0160	0.0320	0.0480	0.0640
39	0.06207	12.25	27775	0.0932	18.49	0.0109	0.0043	0.000593	0.0123	0.0245	0.0368	0.0490
40	0.04869	9.61	35400	0.0723	14.44	0.0096	0.0038	0.000464	0.00961	0.0192	0.0288	0.0384
41	0.03972	7.84	43405	0.0584	11.56	0.0083	0.0034	0.000379	0.00785	0.0157	0.0236	0.0314

42	0.03166	6.25	54429	0.04558	9.00	0.00762	0.0030	0.000299	0.00625	0.0125	0.0188	0.0250
43	0.02452	4.84	70308	0.03683	7.29	0.00685	0.0027	0.000233	0.00484	0.00968	0.0145	0.0194
44	0.0202	4.00	85072	0.03165	6.25	0.00635	0.0025	0.000195	0.00400	0.00800	0.0120	0.0160

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