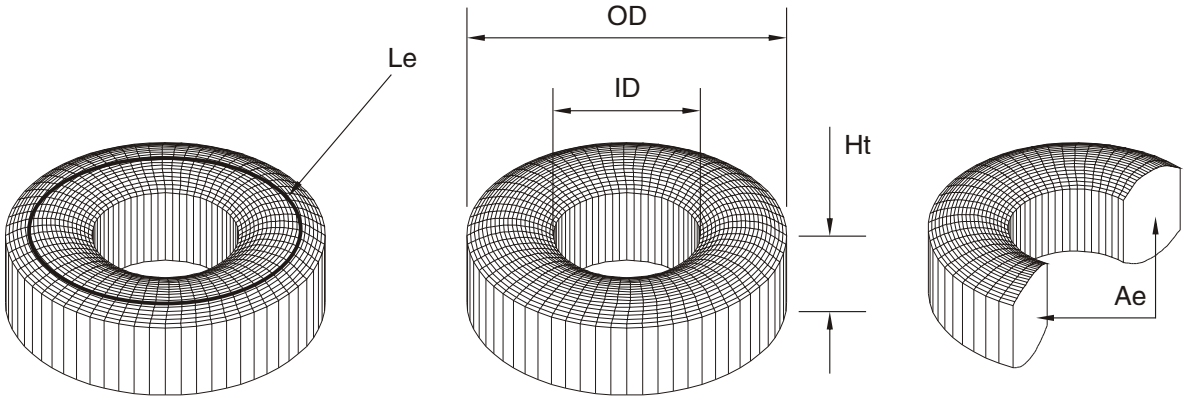
IRON POWDER CORES SERIES PRODUCTS

Cores Design

CHARACTER OF IRON POWDER CORES:



SYMBOL AND FORMULA

$$Ae=\frac{OD-ID}{2}\times Ht \qquad L=\frac{4\pi\mu e\,Ae}{Le}\times N^2$$

$$Le=\frac{OD+ID}{2}\times \pi \qquad N=\sqrt{\frac{L}{A_L}} \qquad A_L=\frac{L}{N^2}$$

Ae–Core cross section area(cm^2)

Le–Effective magnetic path length(cm)

N–Winding turns

A_L–Inductance rated value (nH/N2) of one core, during frequency 10KHz and AC flus density 10 gauss(1mT)

L–Inductance

μ_e–Effective Permeability

π–3.14

IRON POWDER CORES SERIES PRODUCTS

Property contrast

Sendust Core, MPP Core, High Flux Core

CHARACTER OF IRON POWDER CORES:

1. High saturated magnetic induction strength , it may work in large current, without saturation.

2. Stable and reliable properties, effective permeability has excellent frequency property.

3. Having good temperature property , apply to -65℃ to +125℃ temperature range.

4. Toroidal structure has minimum electromagnetic radiation, save shielded materials and reduce the requirement for shield work.

5. Iron powder cores have outstanding restrained and absorbed ability for noise. Its property is more than that of metal lamination and Ferrite core.

In light–adjusting circuit, adopt iron powder cores to restrict the climbing rate after set up an electric circuit and gain more ideal current rising curve, effectly remove harmful wave than metal lamination core (90°conducting angle).

In many using situation, to prevent magnetic saturation, it opens up a air–gap in Ferrite core and lamination core (Si–Fe, Ni–Fe) magnetic path to use " cut–open effect ", but it will cause additional loss and electromagnetic radiation in partial air–gap. Seeing that switch frequency to develop high frequency, strengthening sensitivity of circuit, that is not to be ignored. Using iron powder cores can avoid or greatly reduce this side effect and noise.

IRON POWDER CORES SERIES PRODUCTS

Property contrast

Sendust Core, MPP Core, High Flux Core

CHARACTER OF IRON POWDER CORES:

Powder core Features

Cores	Features	Applications
Iron Powder Cores	· High Maximum Flux Density · Low Cost · Large Energy Storage Capacity	· Output Chokes for Switching Power Supplies · Conducted EMI Noise Filters · Pulse Transformers · DC Output/Input Filters · Light Dimmer Chokes(PFc) · Power Factor Correction Inductors · Continuous–mode Fly–back Inductors
Sendust Cores	· Core Losses Significantly Lower than Iron Powder Cores · Good DC–Bias Characteristics · Cost between Powder Iron and MPP	· Switching Regulator Inductors · In–line Noise Filters · Pulse Transformers, Fly–back Transformers · PFC Chokes
MPP Cores	· High Resistivity · Low Hysteresis and Eddy Current Losses · Excellent Inductance Stability under High DC–Bias Cindition · Good Temperature Stability	· Inductors for High Q · Low Loss Filter Circuits · Loading Coils · Transformers,Chokes and Inductors · Out–put Filter · Storage Chokes
High Flux Cores	· Excellent DC–Bias Characteristics · High Bmax of 15000Gauss Compared to MPP or Ferites · Core Losses Significantly Lower than Iron Cores · Large Energy Storage Capacity	· In–line Noise Filters · Switching Regulator Inductors · Pulse transformers, Fly–back Transgormers · PFC Chokes · Out–put Filter · Storage Chokes

IRON POWDER CORES SERIES PRODUCTS

Toroidal Cores

MATERIAL PROPERTIES

Material Mix number	Reference Permeability (μe)	(+PPm/℃) Temp. Coef. of Perm	Permeability With DC Bias HDC=50 Oersteds @10kHz		Color Code
			% μ_0	μ effective	
-1	20	280			Blue/Cyan
-2	10	100	100	10	Red/Gray
-2/93	10	100	100	10	Gray/Red
-3	35	370			Gray/Cyan
-6	8.5	35			Yellow/Cyan
-7	9.0	30			White/Cyan
-8	35	300	91	32	Yellow/Red
-8/93	35	300	91	32	Red/Yellow
-10	6.0	150			Black/Cyan
-15	25	190			Red/White
-18	55	385	74	41	Green/Red
-26	75	825	51	38	Yellow/White
-28	22	510	91	20	Gray/Green
-30	22	510	91	20	Green/Gray
-33	33	665	84	28	Gray/Yellow
-34	33	565	84	27.7	Gray/Blue
-35	33	665	84	27.7	Yellow/Gray
-38	85	955	51	44	Gray/Black
-40	60	950	62	37	Green/Yellow
-45	100	1040	46	46	Black/Black
-52	75	650	59	44	Green/Blue
MPP	14, 26, 60, 90, 125	60			Gray
HI-FLUX	14, 26, 60, 125	140			Blue
SENDUST	14, 26, 60, 75, 90, 125	400			Black
AMORPHOUS	26, 60, 75, 90	180			Blue

IRON POWDER CORES SERIES PRODUCTS

Toroidal Cores

THERMAL CHARACTERISTICS

Iron Powder Cores are fitted for temperature range from -65℃ to +125℃.When cores are placed in higher temperature over 150℃, it will make inductance and quality factor(Q) to perpetually decrease. Change in this character is depended on time, temperature, core size, frequency and flux density etc.

The cores are manufactured to the AL values listed; the permeability for each material is for reference only. In all cases, the AL values are based on a peak AC flux density of gauss (1mT) at a frequencecy of 10kHz.

Typical tolerance of magnetic character curve is ±10%, that of core loss curve is ±15%.

The toroidal cores are tested with a even separated single-layer winding in order to minimize leakage effects.

SURFACE COATING

Toroidal iron powder cores, manufactured by this company, is well finished with protecting paint. The minimum dielectric strength of coating is 600Vrms under 50Hz. The dielectic strength also may be increased according to the needs of customer. The surface of E-shaped and I-shaped cores are treated with antirust material. We suggest the user to carefully store the untreated products to avoid moist and rain.

SPECIAL PRODUCTS

Except for the listed size in this manual, we can manufacture special products to meet the needs of customers. The listed materials in this manual can be made cores with different height, but not increase model tool. If you have any special requirements, please contact with this company.

Our normal packing box weight is 15 to 20kg/box.

MATERIAL DESCRIPTION

-2 Material The low permeability of this material will result in a lower operating AC flux density than with other material with no additional gap-loss, it is suitable for high Frequency application.

-2/93 Material with its good linearity at high bias current is a less expensive alternative for -2 Material. It is suitable for applications that care less about the high frequency core loss.

-8 Material This material has low core loss and good linearity under high bias conditions. a good high frequency material. The highest cost material.

-8/93 Material is a less expensive alternative for -8 Material, the core loss is close to -8 Material and the linearity at high bias current is very good.

-18 Material This material has low core loss similar to the -8 Material with higher permeability and a lower cost, good saturation characteristics.

-26 Material The most popular material. It is a costeffective general purpose material that is useful in a wide varity of power conversion and line filter application.

-28 Material The good linearity, low cost, and relatively low permeability of this material make it popular in the larger sizes for high power UPS chokes.

-33 Material An inexpensive alternate to the -8 Material for applications where high frequence core loss is not critical, good linearity with high bias.

-40 Material The least expensive material, It has characteristics quite similar to the very popular -26Material, popular in the larger sizes.

-45 Material The highest permeability material. a high permeability alternate to -52 Material with slightly higher core losses.

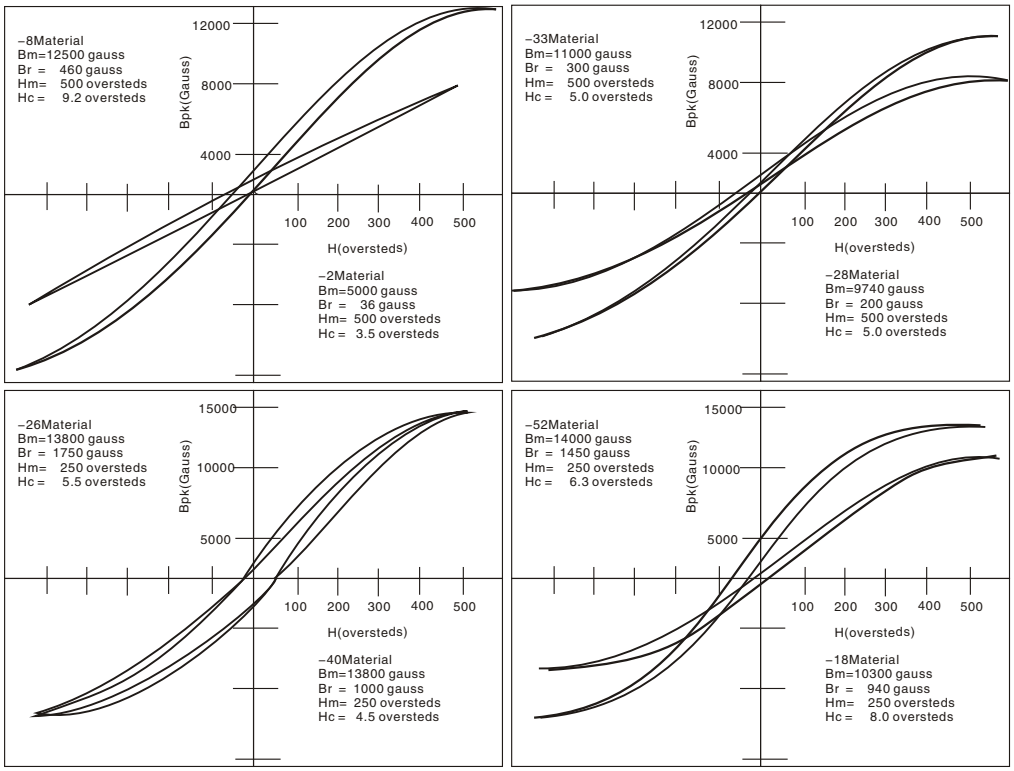
-52 Material This material has lower core loss at high frequency and the same permeability as the -26 Material. It is very popular for new high frequency choke designs.

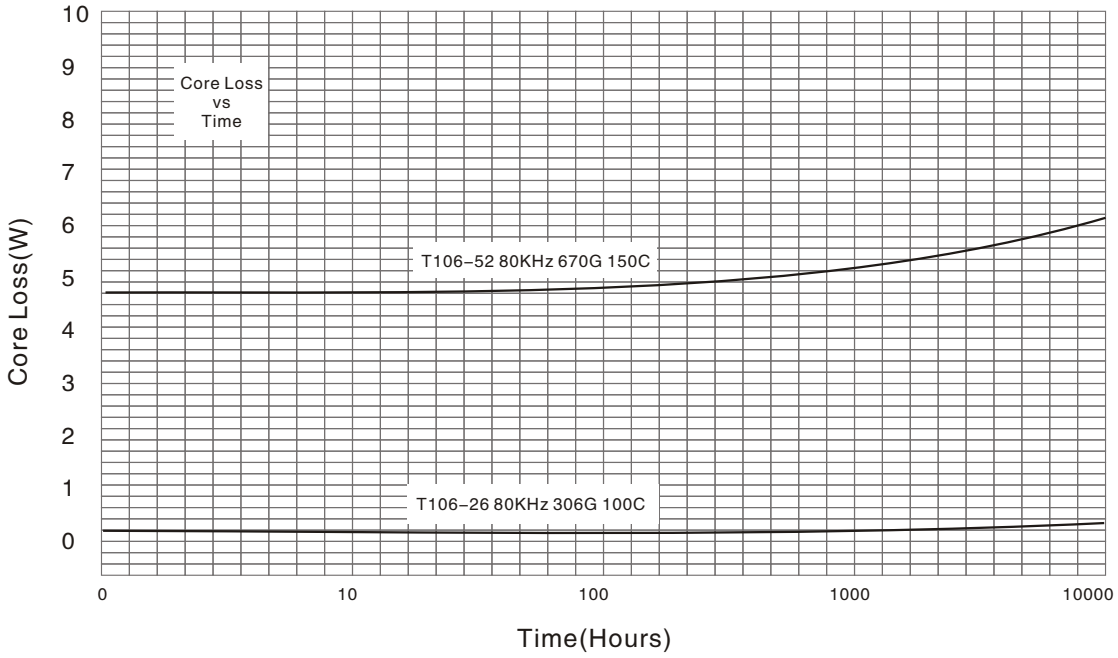
IRON POWDER CORES SERIES PRODUCTS

Magnetic Characteristics

CHARACTER OF IRON POWDER CORES:

B–H CURVES



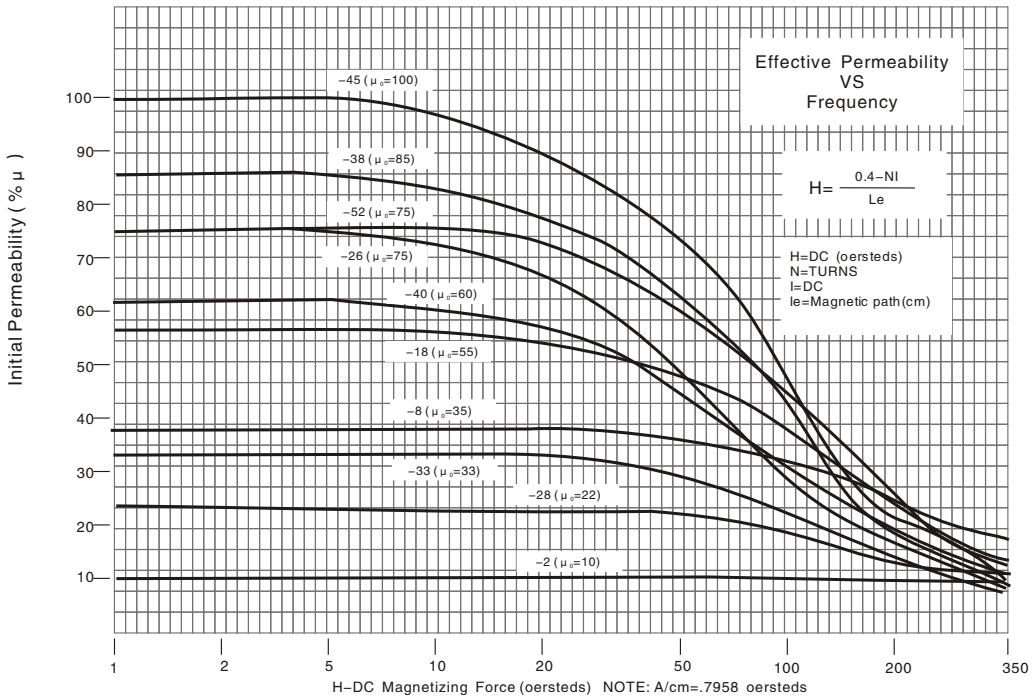


IRON POWDER CORES SERIES PRODUCTS

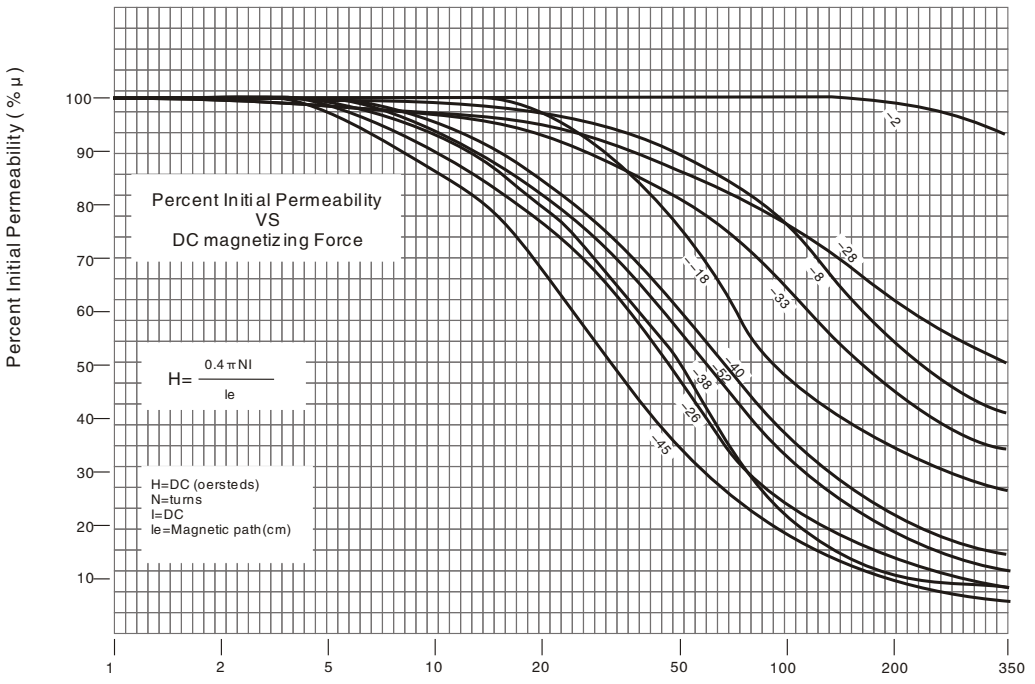
Magnetic Characteristics

CHARACTER OF IRON POWDER CORES:

Initial Permeability VS DC Magnetizing Force



Percent Initial Permeability VS DC Magnetizing Force

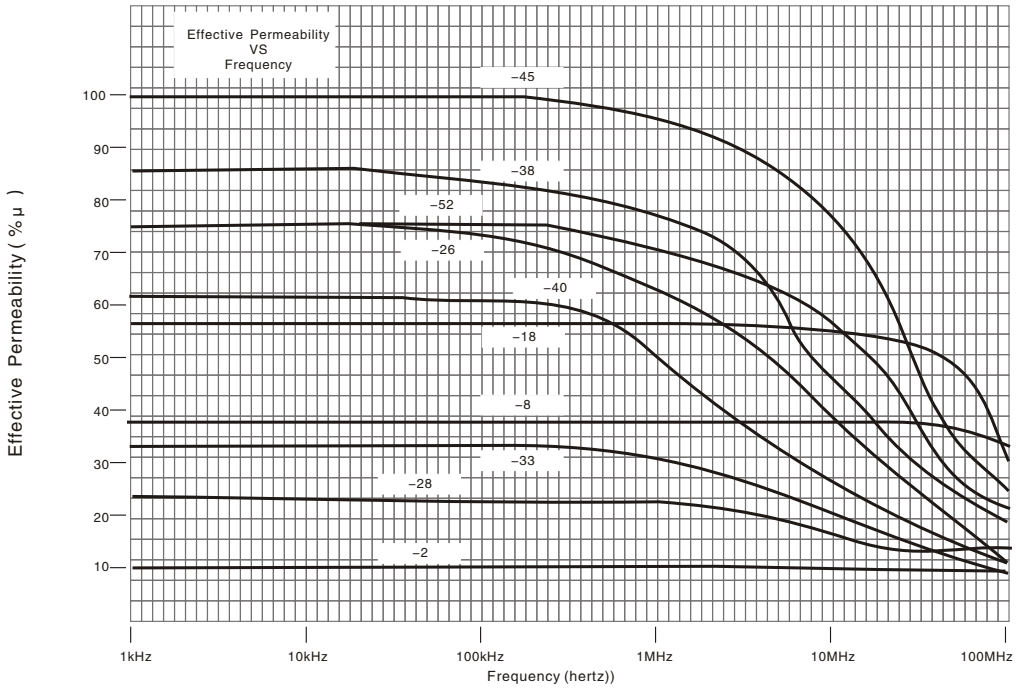


IRON POWDER CORES SERIES PRODUCTS

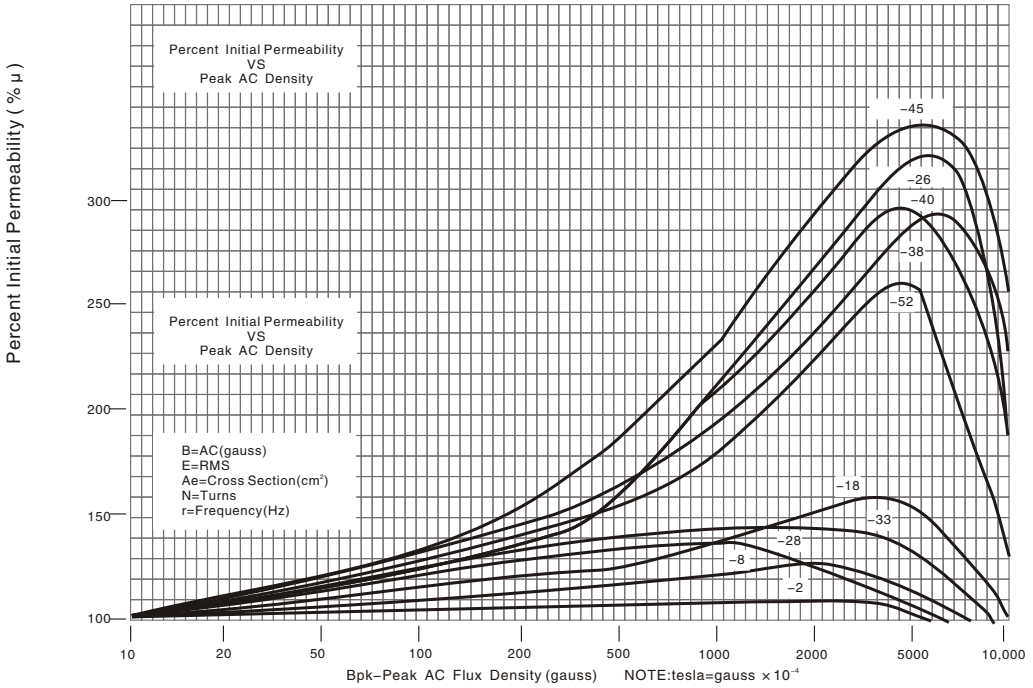
Magnetic Characteristics

CHARACTER OF IRON POWDER CORES:

Effective Permeability VS Frequency



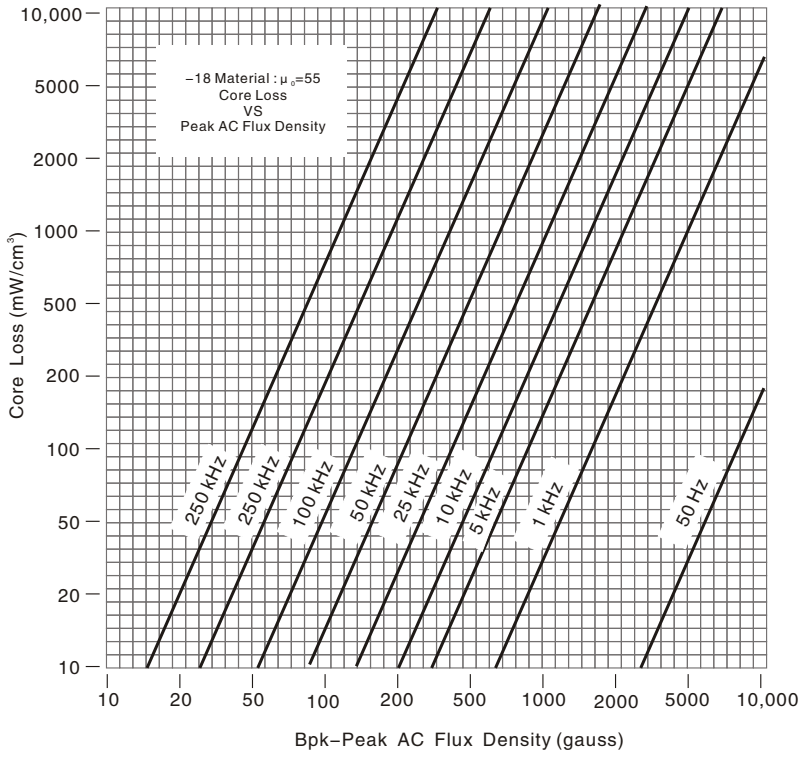
Percent Initial Permeability VS Peak AC Flux Desity

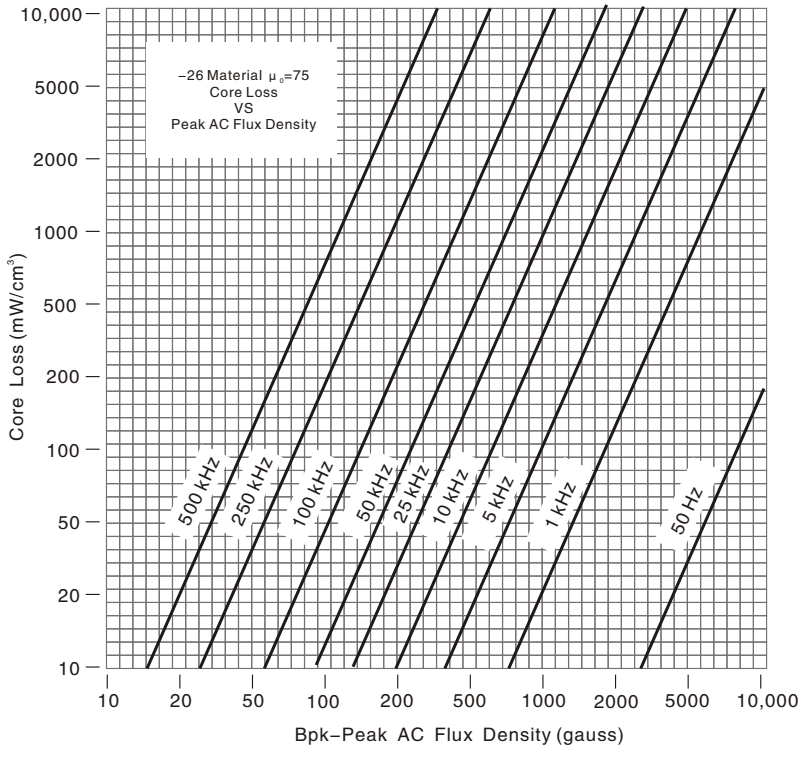


IRON POWDER CORES SERIES PRODUCTS

Magnetic Characteristics

CHARACTER OF IRON POWDER CORES:





IRON POWDER CORES SERIES PRODUCTS

Magnetic Characteristics

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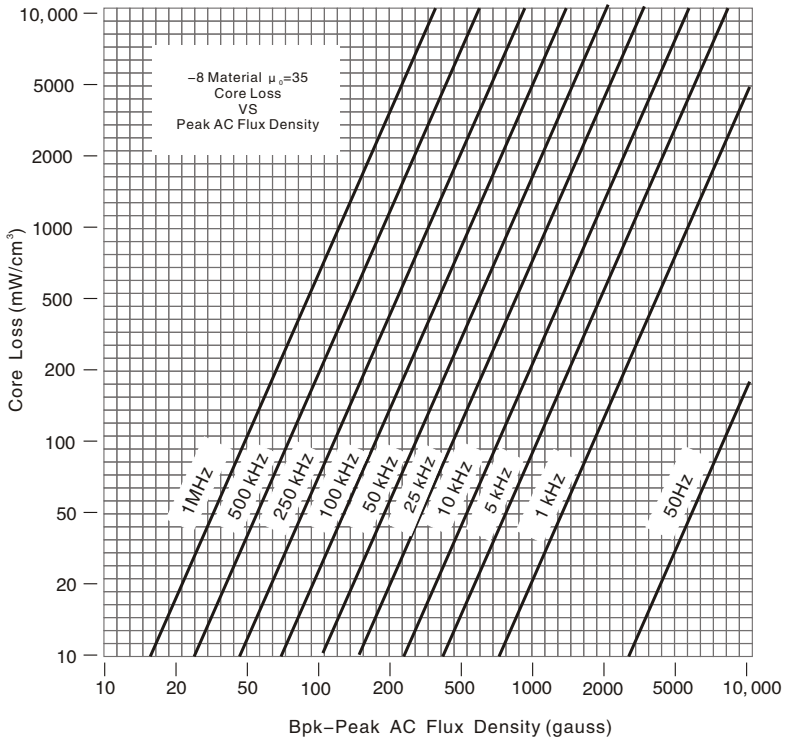

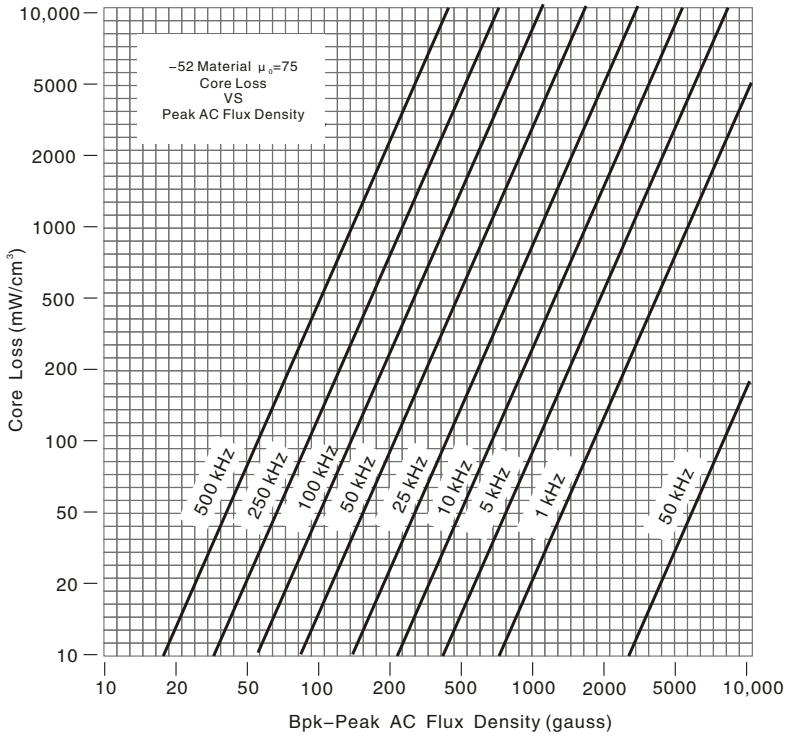

IRON POWDER CORES SERIES PRODUCTS

Magnetic Characteristics

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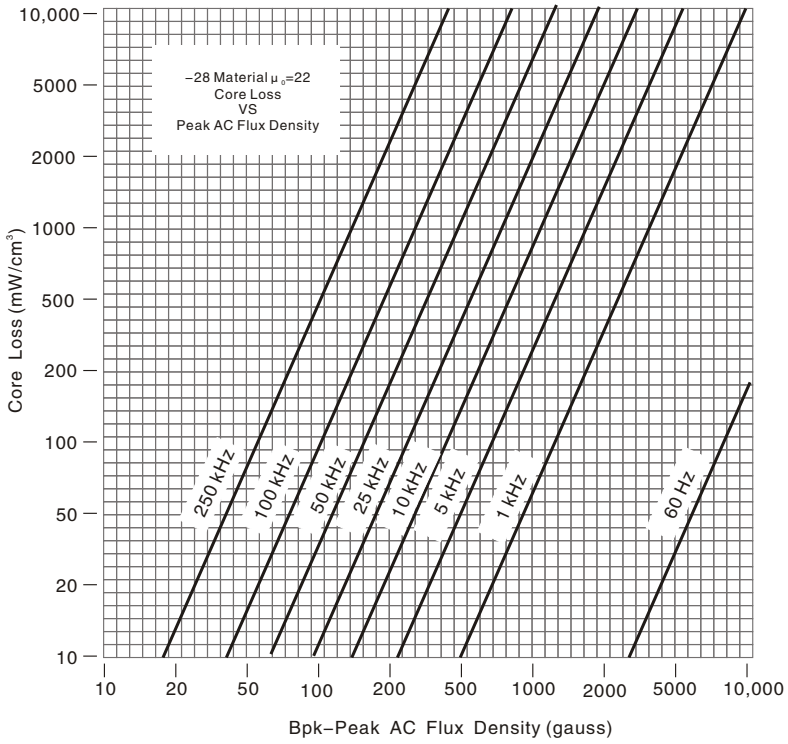

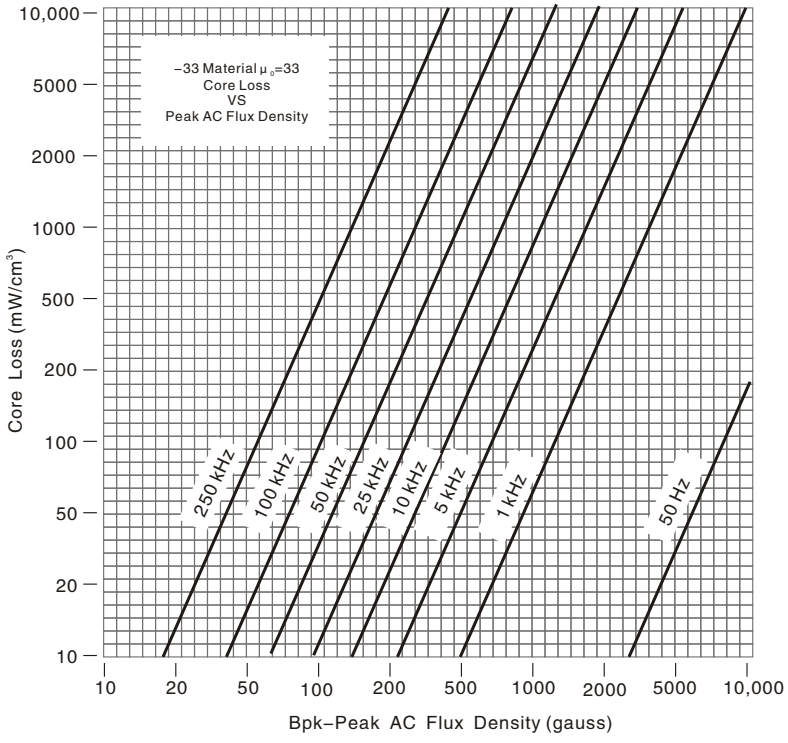

IRON POWDER CORES SERIES PRODUCTS

Magnetic Characteristics

CHARACTER OF IRON POWDER CORES: