Symbols and Definitions

μi A.C. Initial Permeability
μ_i is defined as the limited value of a ferrite core at the origin of the curve of initial magnetization:

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

μ_0 : Permeability of vacuum
B: A.C.magnetic flux density
H: A.C.magnetic field strength

μa Amplitude Permeability
similar with μi ,but magnetized by a large amplitude sine field.

Tan δ / μi Relative Loss Factor
loss at low induction level.

PV Power loss
loss at high flux density level.

Bms Effective Saturation Magnetic Flux Density (mT)

Brms Residual Magnetic Flux Density (mT)

Hc Coercive Force (Oersteds) (A/m)

αF Temperature Factor of Permeability

$$\alpha F = \frac{\mu_2 - \mu_1}{\mu_1^{\,2}(T_2 - T_1)} \times 10^6 (T_2 > T_1)$$

μ_1: Permeability of T_1
μ_2: Permeability of T_2

ηB Hysteresis Material Constant

$$\eta B = \frac{\Delta Rh}{\omega L \mu_e \Delta B}$$

ΔRh: hyseresis loss resistance
ω: angular frequency
L : inductace of coil with the core
μ_e: effectve permeability
ΔB: amplitude magnetc flux of density

DF Disaccommodation Factor

$$D_F = \frac{\mu_{i1} - \mu_{i2}}{\mu_{i1}^{\,2}} \times \frac{1}{Log(t_1 / t_2)}$$

μ_{i1}: permeability measured at time t_1 after demagnetization
μ_{i2}: permeability measured at time t_2 after demagnetization

Tc Curie Temperature
temperature at which a ferrite loses is ferromagnetism

ρ Specific Resistivity(Ωm)

d Apparent density,
The Apparent density is defined as a weigh per unit volume

$$d = \frac{W}{V} (g / cm^3)$$

where W: weight of the magnetic core(g)
V : volume of the magnetic core(cm3)

A_L(nH) Inductance Factor
Inductance of a coil on a specified core divided by the square of the number of turns.(Unless otherwise specified the inductance test conditions for the inductance factor are at flux density<10 gauss).

Inductance

$$L = N^2 A_L (\mathrm{n}H)$$

Effective Core Parameters

$$C_1 = \Sigma L / A (cm^{-1})$$

The summation of the magnetic path lengths of each section of a magnetic circuit divided by the corresponding magnetic area of the same section.

$$C_2 = \Sigma L / A^2 (cm^{-3})$$

The summation of the magnetic path lengths of each section of a magnetic circuit divided by the square of the corresponding magnetic area of the same section.
$Le=C_1^2/C_2$(cm) Effective magnetic path length
$Ae=C_1/C_2$(cm^2) Effective cross-sectional area
$Ve=C_1^3/C_2^2$(cm^3) Effective core volume
C_1 (mm^{-1}) Core constant
Aw (mm^2) Winding area of core
Ac (mm^2) cross-sectional centre leg area
W (g) Approx.weigh of core

MATERIAL CHARACTERISTICS

Low Loss & High Bs Material

Material		Symbol	Unit	P1	P2	P3	P4	P5
Initial permeability	25℃	i		2000±25%	2500±25%	2300±25%	2200±25%	1400±25%
Amplitude permeability at 25kHz sine wave, 200mT	25℃	a		2800min	3200min	3000min	2800min	2400min
Curie temperature		Tc	℃	>220	>230	>215	>230	>235
Relative Core loss 25KHz200mT	25℃	Pv	kw/m³	<165	<130	<120		
				<115	<90	<80		
	100℃			<155	<100	<70		
Relative Core loss 100KHz200mT	25℃	Pv	kw/m³			<650	<600	130
						<480	<400	90
	100℃					<420	<310	80
Relative Core loss 300KHz100mT	25℃	Pv	kw/m³				670	230
							540	240
	100℃						480	260
Relative Core loss 500KHz50mT	25℃	Pv	kw/m³				310	180
							280	160
	100℃						250	120
Saturation flux density at 1000A/m f=10kHz	25℃	Bm	MT	470	510	500	490	470
				430	450	440	450	420
	100℃			370	390	380	400	380
Remanence	25℃	Br	MT	130	118	95	130	130
				90	80	65	65	65
	100℃			95	83	55	60	55
Coercivity field strength f=10kHz	25℃	Hc	A/m	13	12	13	18	30
				8	8	10	16	30
	100℃			8	8	9	11	47.2
Resistvity			Ù·m	10	10	7	7	7
Density			g/cm³	4.8	4.8	4.8	4.8	4.8
Note 1				EI, EE, PQ, EER, RM, EP, EFD, EPC, EF, ETD, UI, EL, POT, T	EI, EE, PQ, EER, RM, EP, EFD, EPC, EF, ETD, UI, EL, POT, T	EI, EE, PQ, EER, RM, EP, EFD, EPC, EF, ETD, FEY POT, T, EPX EEM	EI, EE, PQ, EER, RM, EP, EFD, EPC, EF, ETD, FEY POT, T, EPX EEM	EI, EE, PQ, EER, RM, EP, EFD, EPC, EF, ETD, FEY POT, T, EPX EEM

Note: the above values are obtained with T29 Toriodal core at room tempreature unless otherwise shown.

MATERIAL CHARACTERISTICS

High i Material

Material	Temperature	Symbol	Unit	H3K	H5K	H6K	H7K
Initial permeability	25℃	i		3000±25%	5000±25%	6000±25%	7000±25%
Amplitude premeability at 25kHz sine wave, 200mT	25℃	a		3700min	5600min	6600min	7800min
Curie temperature		Tc	℃	>210	>200	>150	>140
Relative Core loss 25KHz200mT	25℃	PV	60℃ kw/m³	<180	<180	<180	
				<130	<160		
			100℃	<160	<200	<200	
Relative Core loss 100KHz200mT	25℃	PV	kw/m³				
	60℃						
	100℃						
Saturation flux density at 1000A/m	25℃	Bms	60℃mT	500	500	440	420
				450	450	390	390
			100℃	390	390	320	320
Remanence	25℃	Brs	mT	130	118	95	120
	60℃			90	80	65	
			100℃	95	83	55	
Coercivity	25℃	Hc	A/m	11	10	10	12
	60℃			8	8	8	
			100℃	8	8	8	
Resistvity			Ù·m	4	4	1	2
Density			g/cm³	4.8	4.8	4.8	4.8
Note 1				EI, EE, PQ, EER, RM, EP, T, UF ET, FT	EI, EE, PQ, EER, RM, EP, T, UF ET, FT	EI, EE, PQ, EER, RM, EP, T, UF ET, FT	EI, EE, PQ, EER, RM, EP, T, UF ET, FT

MATERIAL CHARACTERISTICS

High i Material

Material	Temperature	Symbol	Unit	H8K	H10K	H12K	H15K
Initial permeability	25℃	i		8000±25%	10000±25%	12000±30%	15000±30%
Amplitude permeability at 25kHz sine wave, 200mT	25℃	a					
Curie temperature		Tc	℃	130	120	110	110
Relative Core loss 25KHz200mT	25℃	PV	kw/m³				
	60℃						
	100℃						
Relative Core loss 100KHz200mT	25℃	PV	kw/m³				
	60℃						
	100℃						
Saturation flux density at 1000A/m	25℃	Bms	mT	420	420	380	380
	60℃						
	100℃						
Remanence	25℃	Br	mT	110	90	100	100
	60℃						
	100℃						
Coercivity	25℃	Hc	A/m	12	10	7	12
	60℃						
	100℃						
Resistvity			Ù·m	0.5	0.2	0.1	0.1
Density			g/cm³	4.9	4.9	4.9	4.9
Note 1				UF, EI, EE, PQ, EER, RM, EP, T, POT	UF, EI, EE, PQ, EER, RM, EP, T, POT	UF, EP, RM, T, POT	ET, FT, RM EP, T, POT

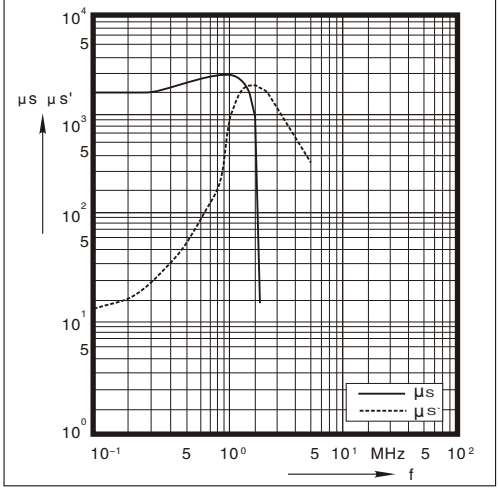
MATERIAL CHARACTERISTICS

High Q Material

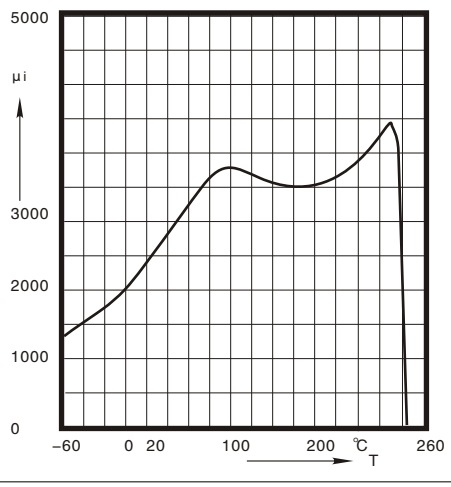
Material	Temperature	Symbol	Unit	HQ8H	HQ2K	HQ2KA
Initial permeability	25℃	i		800±25%	2000±25%	2000±25%
Amplitude permeability at 25kHz sine wave, 200mT	25℃	a				
Curie temperature		Tc	℃	220	130	120
Relative Temperature coefficient	-10~55℃	F	10^{-6}/k	0～2.0	0～1.5	0～1.5(-20～70℃)
Relative loss factor		Tan/i	10^{-6}	5(500KHz) 16(1MHz)	3 (100KHz)	2 (100KHz)
Disaccommdation factor	1to10 minutes	DF	10^{-6}	3	2	3.5
Saturation flux density at 1000A/m (f=10kHz)	25℃	Bms	60℃mT	380	380	390
			100℃			
Remanence	25℃	Brs	mT	150	100	120
		60℃				
		100℃				
Coercivity	25℃	Hc	A/m	40	16	16
		60℃				
		100℃				
Resistvity			Ù·m	2	0.5	0.2
Density			g/cm^3	4.8	4.9	4.9
Note 1				EP, T, POT, RM	EP, POT, RM, T	EP, T, POT, RM

CHARACTERISTICS CURVE P2

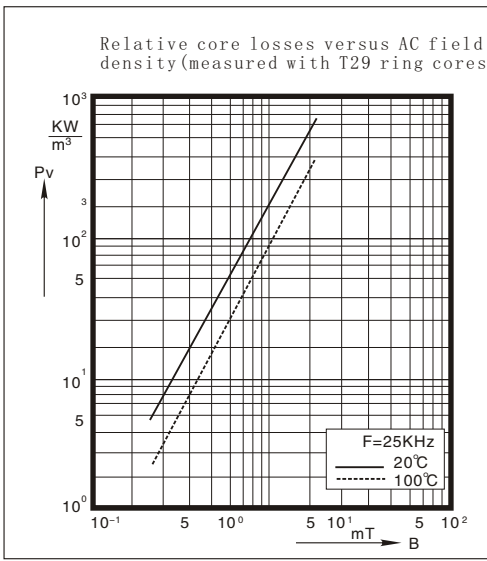
Complex permeability versus frequency
(measured with T29 ring cores, B≤0, 25mT)



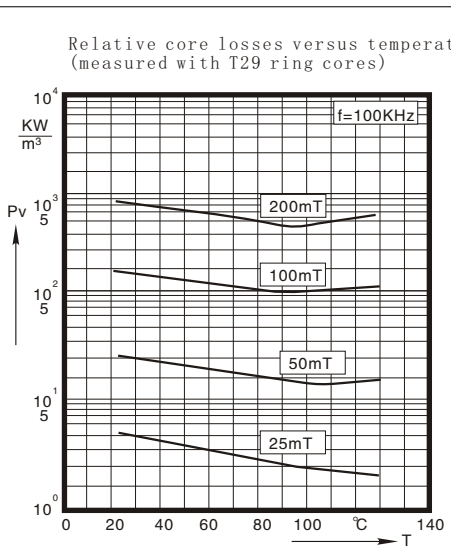
Initial permeability i versus temperature
(measured with T29 ring cores, B≤0, 25mT)



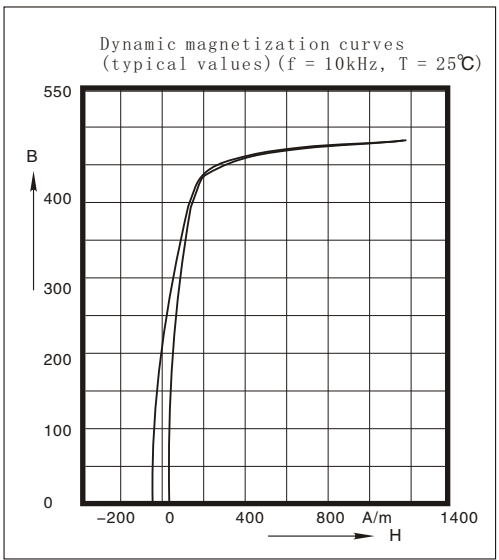
Relative core losses versus AC field flux density(measured with T29 ring cores)



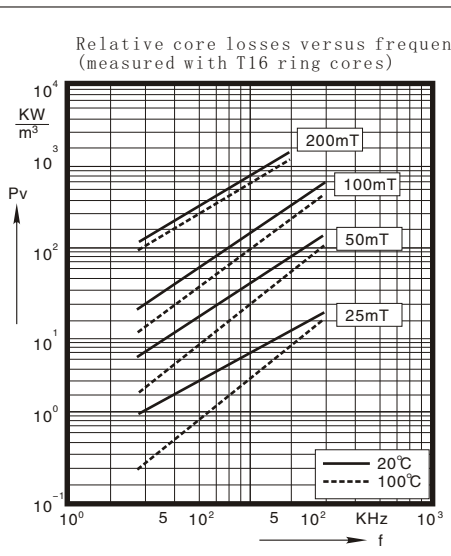
Relative core losses versus temperature
(measured with T29 ring cores)



Dynamic magnetization curves
(typical values)(f = 10kHz, T = 25℃)

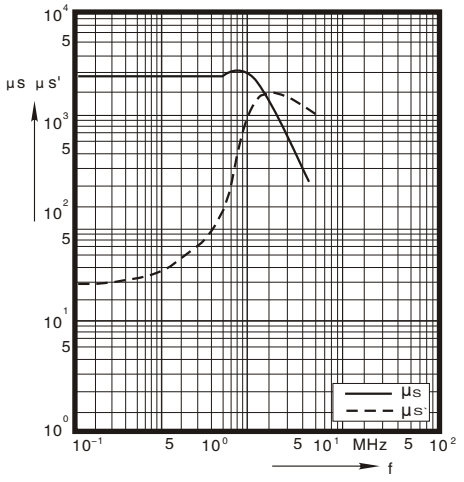


Relative core losses versus frequency
(measured with T16 ring cores)

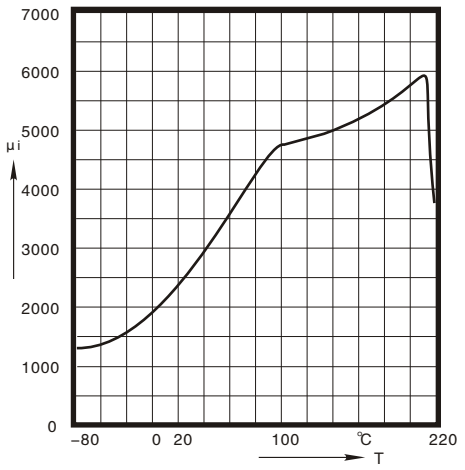


CHARACTERISTICS CURVE P3

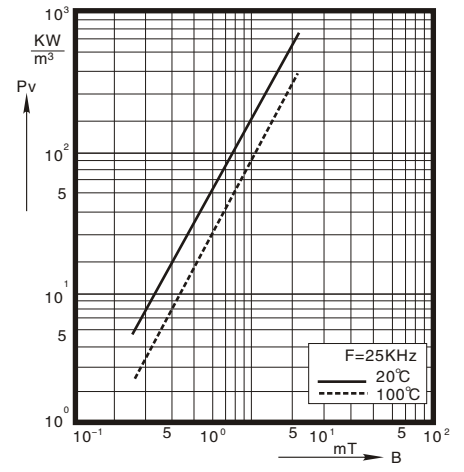
Complex permeability versus frequency
(measured with T10 ring cores, B≤0,25mT)



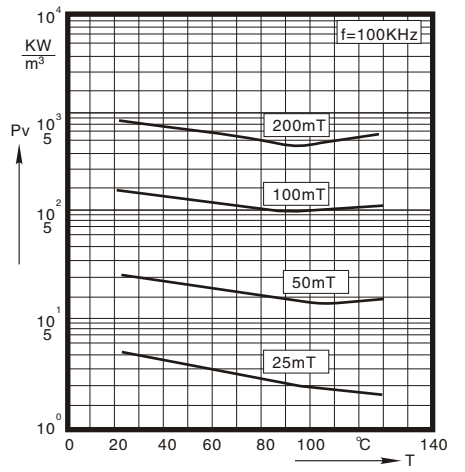
Initial permeability i versus temperature
(measured with T10 ring cores, B≤0,25mT)



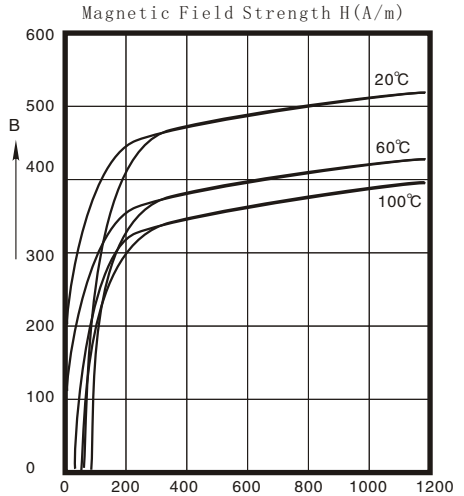
Relative core losses versus AC field flux density(measured with T16 ring cores)



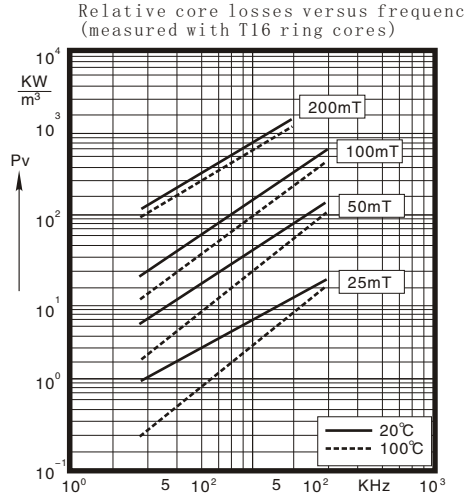
Relative core losses versus temperature
(measured with T16 ring cores)



Magnetic Field Strength H(A/m)



Relative core losses versus frequency
(measured with T16 ring cores)



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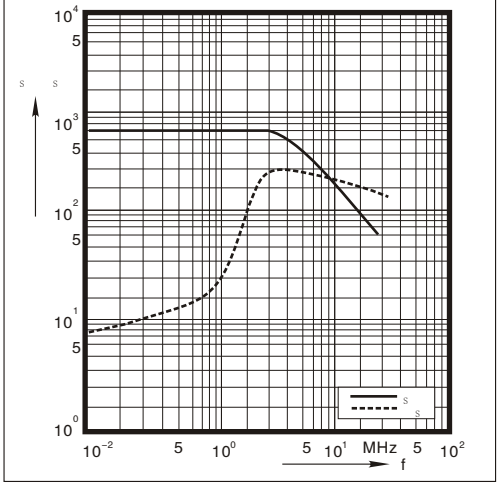
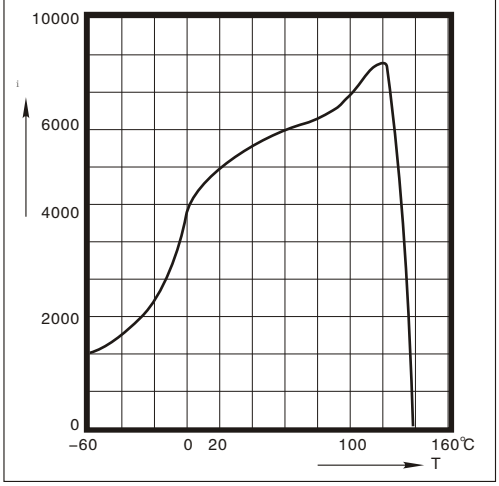
CHARACTERISTICS CURVE H6K

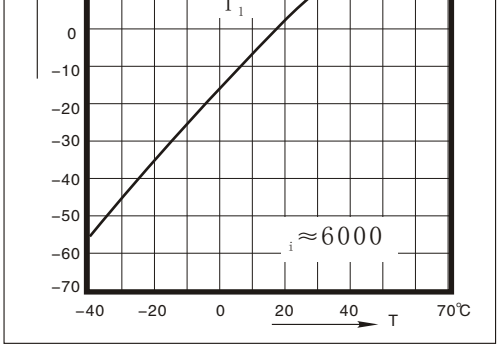
Complex permeability versus frequency
(measured with T10 ring cores, B≤0,25mT)



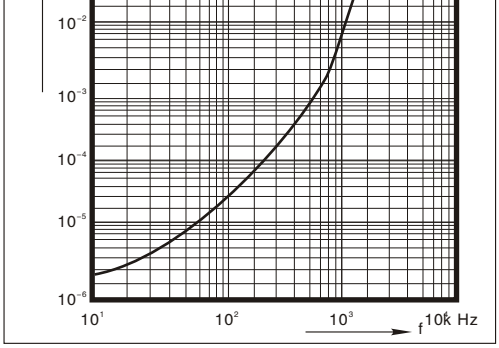
Initial permeability i versus temperature
(measured withT16 ring cores, B≤0,25mT)



Relative core losses versus AC field flux density(measured with T16 ring cores)

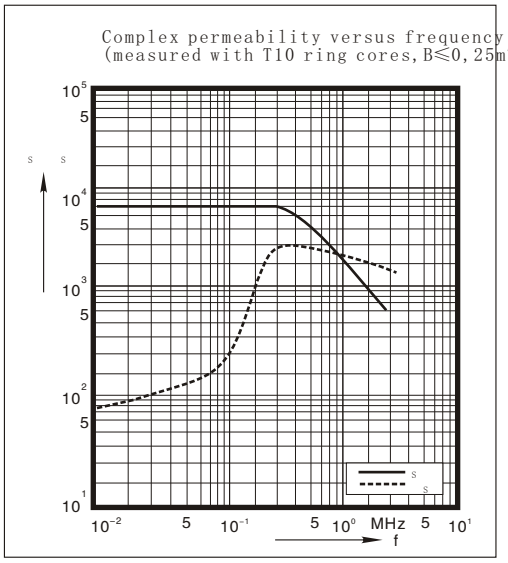


Relative core losses versus temperature
(measured with T16 ring cores, B≤0,25mT)

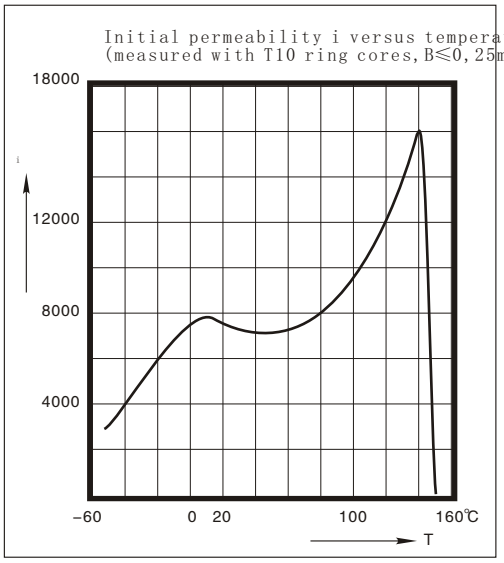


CHARACTERISTICS CURVE H7K

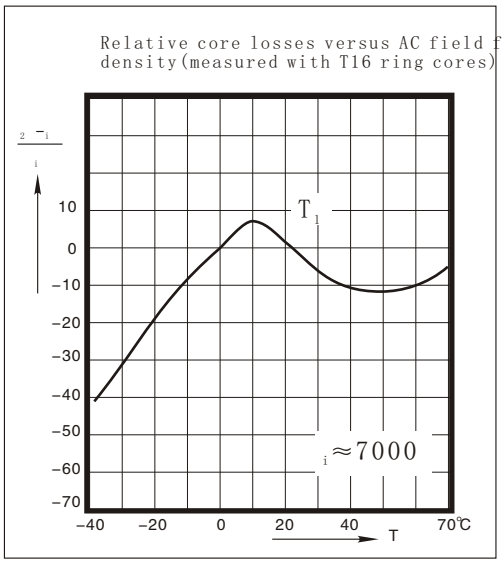
Complex permeability versus frequency
(measured with T10 ring cores, B≤0,25mT)



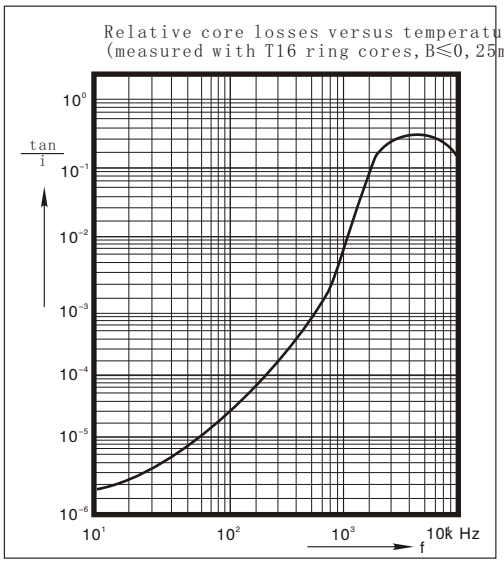
Initial permeability i versus temperature
(measured with T10 ring cores, B≤0,25mT)



Relative core losses versus AC field flux density(measured with T16 ring cores)

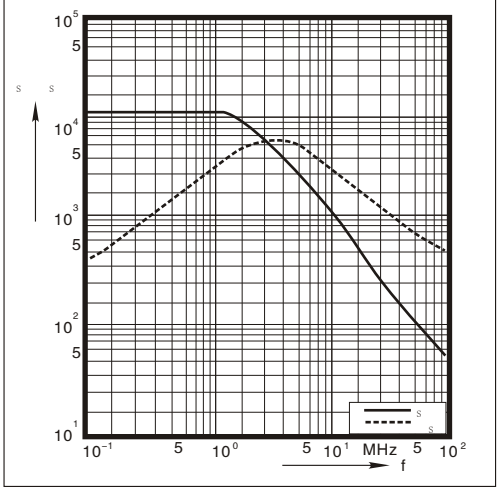


Relative core losses versus temperature
(measured with T16 ring cores, B≤0,25mT)

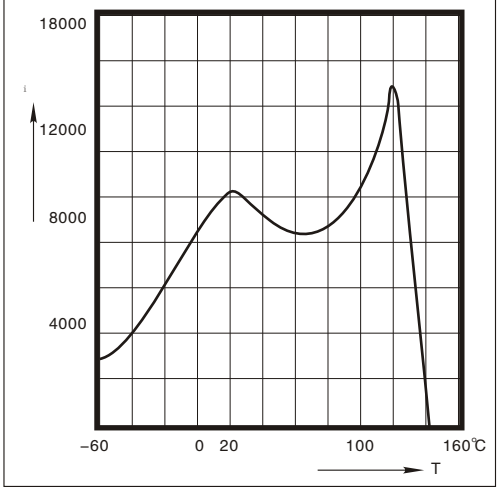


CHARACTERISTICS CURVE H10K

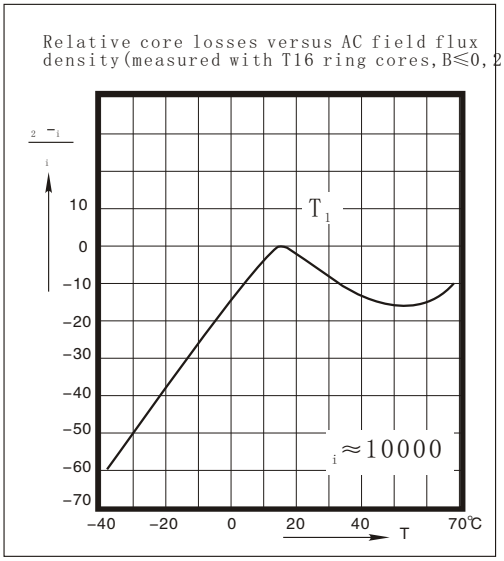
Complex permeability versus frequency
(measured with T14 ring cores, B≤0,25mT)



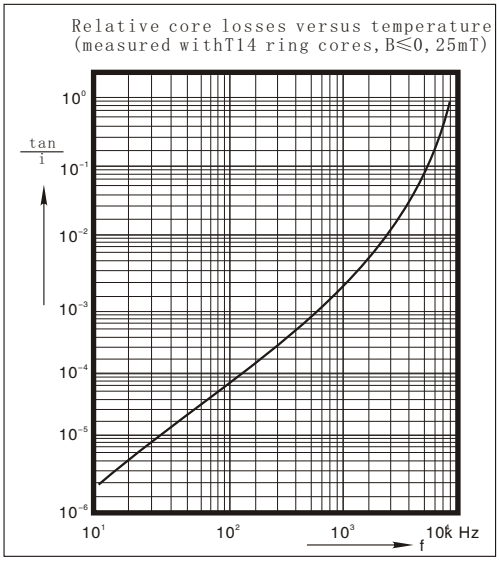
Initial permeability i versus temperature
(measured with T16 ring cores, B≤0,25mT)



Relative core losses versus AC field flux density(measured with T16 ring cores, B≤0,25mT)

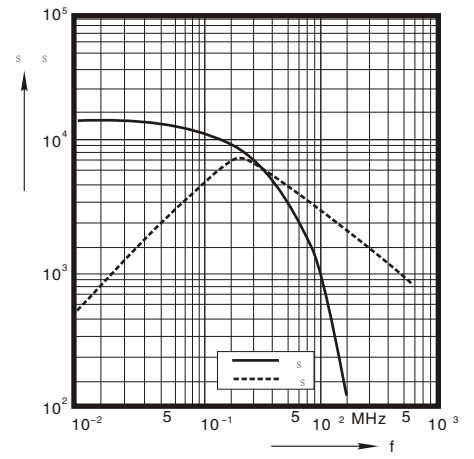


Relative core losses versus temperature
(measured withT14 ring cores, B≤0,25mT)

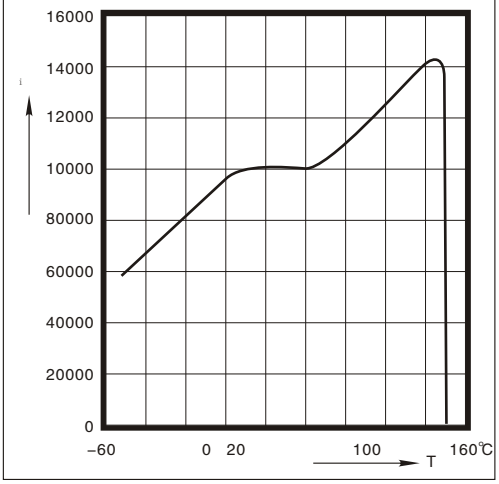


CHARACTERISTICS CURVE H15K

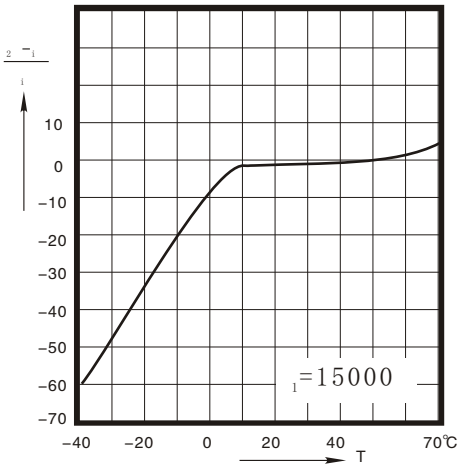
Complex permeability versus frequency
(measured with T18 ring cores, B≤0.25mT)



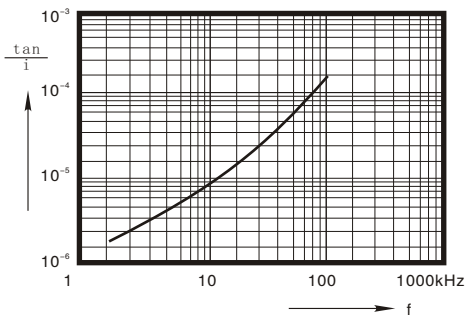
Initial permeability i versus temperature
(measured with T18 ring cores, B≤0,25mT)



Relative core losses versus AC field flux density(measured with T18 ring cores)

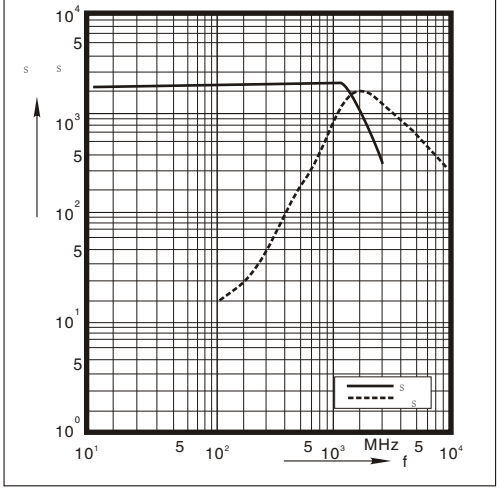


Relative core losses versus temperature
(measured with T18 ring cores, B≤0,25mT)

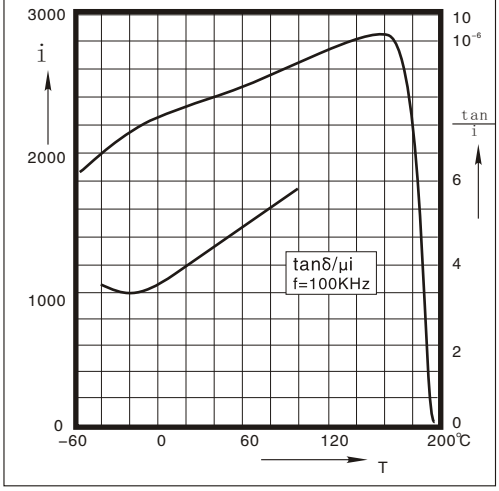


CHARACTERISTICS CURVE HQ2K

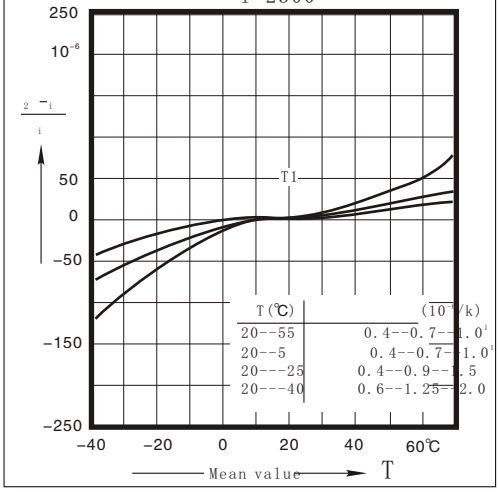
Complex permeability versus frequency
(measured with T10 ring cores, B≤0, 25mT)



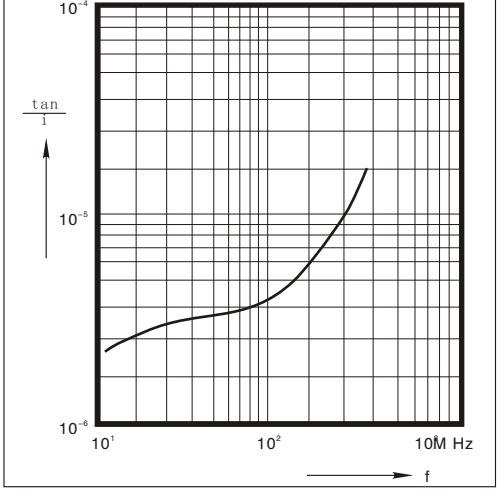
Initial permeability i and relative loss factor tan/i versus temperature
(measured with T10 ring cores, B≤0, 25mT)



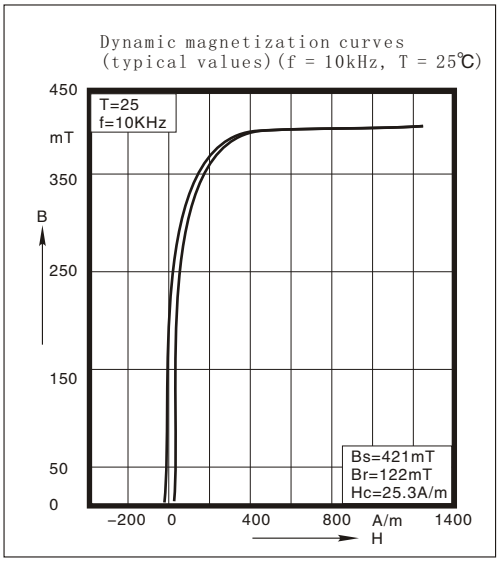
Permeability factor versus temperature
(measured with P&RM cores, B≤0, 25mT)
i=2300



Relative core losses factor tan/i versus frequency(measured with T29 ring cores,)



Dynamic magnetization curves
(typical values)(f = 10kHz, T = 25℃)



Dynamic magnetization curves
(typical values)(f = 10kHz, T = 100℃)