Ferrites and accessories

SIFERRIT material K1

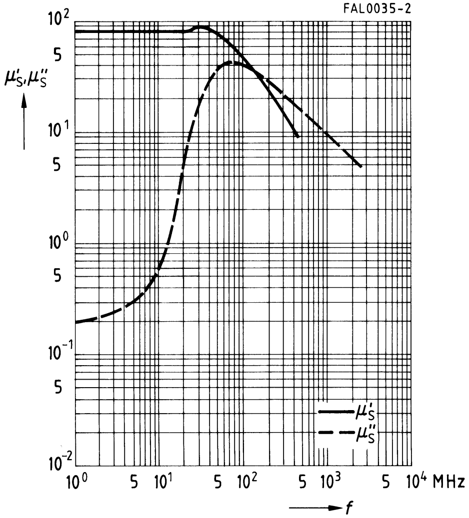
Date: September 2006

Material properties

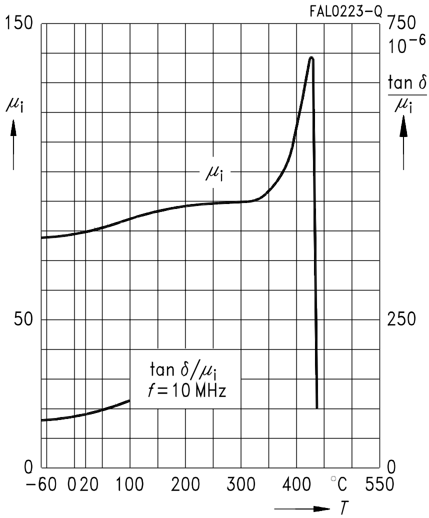
Preferred application			Resonant circuit inductors
Material			K1
Base material			NiZn
Color code (adjuster)			violet
	Symbol	Unit	
Initial permeability (T = 25 °C)	μ_i		80 ±25%
Meas. field strength Flux density (near saturation) (f = 10 kHz)	H B_S (25 °C) B_S (100 °C)	A/m mT mT	5000 310 280
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	380 350
Optimum frequency range	f_{min} f_{max}	MHz	1.5 … 12
Relativeat f_{min} loss factorat f_{max}	$\tan\delta/\mu_i$	10^{-6} 10^{-6}	<40 <120
Hysteresis material constant	η_B	10^{-6}/mT	<36
Curie temperature	T_C	°C	>400
Relative temperature coefficient at 25 … 55 °C at 5 … 25 °C	α_F	10^{-6}/K	 2 … 8 7 … 1
Mean value of α_F at 25 … 55 °C		10^{-6}/K	4
Density (typical values)		kg/m^3	4800
Disaccommodation factor at 25 °C	DF	10^{-6}	20
Resistivity	ρ	Ωm	10^5
Core shapes			RM, P, Toroid, P core half

K1

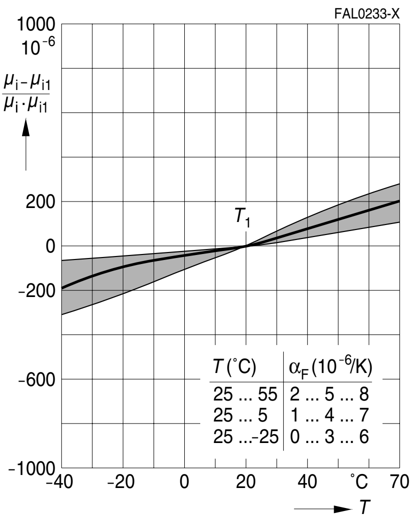
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0.25$ mT)



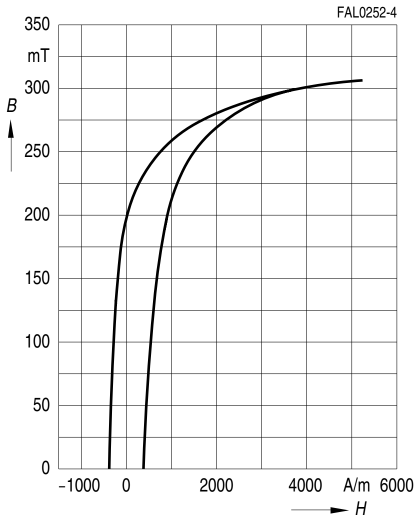
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0.25$ mT)



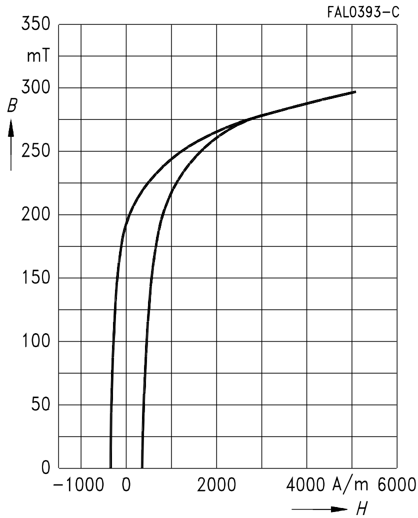
Permeability factor versus temperature
(measured on P and RM cores,
$\hat{B} \leq 0.25$ mT), $\mu_i \approx 80$



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



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



General

Based on IEC 60401-3, the data specified here are typical data for the material in question, which have been determined principally on the basis of toroids (ring cores).

The purpose of such characteristic material data is to provide the user with improved means for comparing different materials.

There is no direct relationship between characteristic material data and the data measured using other core shapes and/or core sizes made of the same material. In the absence of further agreements with the manufacturer, only those specifications given for the core shape and/or core size in question are binding.

Effects of core combination on A_L value

Stresses in the core affect not only the mechanical but also the magnetic properties. It is apparent that the initial permeability is dependent on the stress state of the core. The higher the stresses are in the core, the lower is the value for the initial permeability. Thus the embedding medium should have the greatest possible elasticity.

For detailed information see Data Book 2007, chapter “General – Definitions, 8.2”.

Heating up

Ferrites can run hot during operation at higher flux densities and higher frequencies.

NiZn-materials

The magnetic properties of NiZn-materials can change irreversible in high magnetic fields.

EPCOS

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