Ferrites and accessories

SIFERRIT material T46

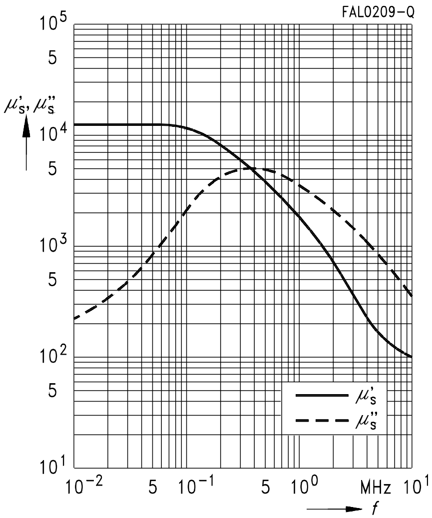
Date: September 2006

Material properties

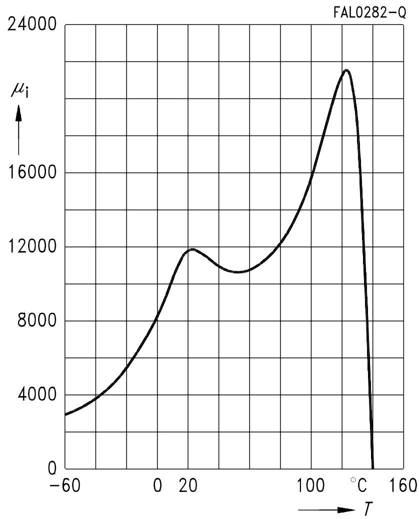
Preferred application			Broadband transformers
Material			T46[1]
Base material			MnZn
	Symbol	Unit	
Initial permeability (T = 25 °C)	μ_i		15000 ±30%
Meas. field strength Flux density (near saturation) (f = 10 kHz)	H B_S (25 °C) B_S (100 °C)	A/m mT mT	1200 400 240
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	7 6
Optimum frequency range	f_{min} f_{max}	MHz	0.01 … 0.10
Relative at f_{min} loss factorat f_{max}	$\tan \delta/\mu_i$	10^{-6} 10^{-6}	<8 <100
Hysteresis material constant	η_B	10^{-6}/mT	<2.0
Curie temperature	T_C	°C	>130
Relative temperature coefficient at 25 … 55 °C at 5 … 25 °C	α_F	10^{-6}/K	 — —
Mean value of α_F at 25 … 55 °C		10^{-6}/K	– 0.6
Density (typical values)		kg/m³	4950
Disaccommodation factor at 25 °C	DF	10^{-6}	—
Resistivity	ρ	Ωm	0.01
Core shapes			Toroid, E

1) Material values defined on the basis of small toroids (≤R10)

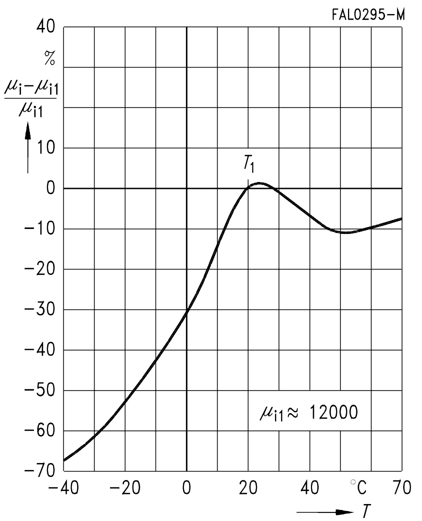
Complex permeability
versus frequency
(measured on R9.5 toroids, $\hat{B} \leq 0.25$ mT)



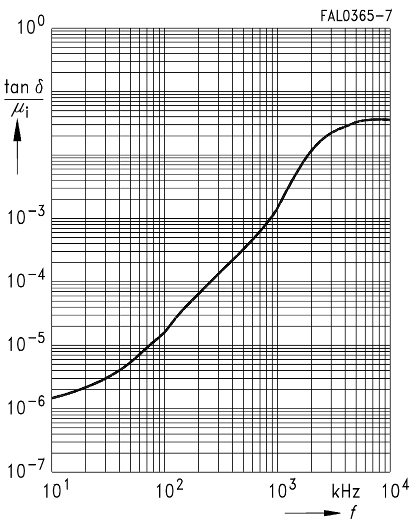
Initial permeability μ_i
versus temperature
(measured on R9.5 toroids, $\hat{B} \leq 0.25$ mT)



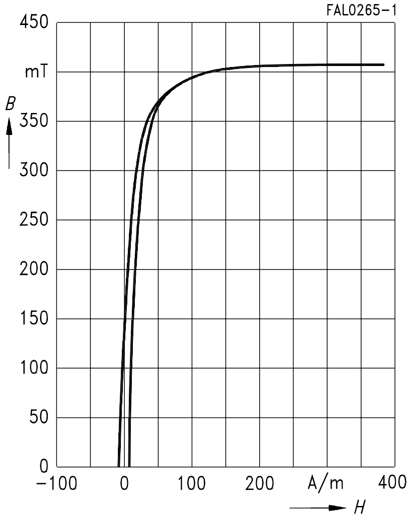
Variation of initial permeability
with temperature
(measured on R9.5 toroids, $\hat{B} \leq 0.25$ mT)



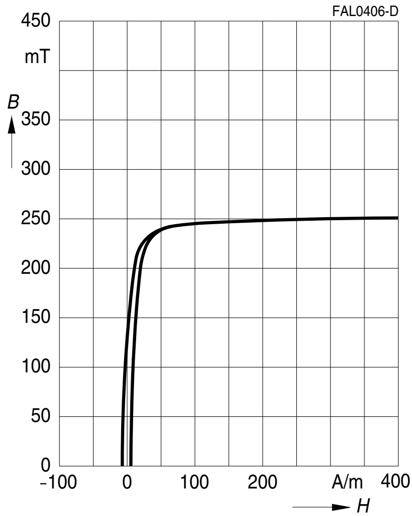
Relative loss factor
versus frequency
(measured on R9.5 toroids, $\hat{B} \leq 0.25$ mT)



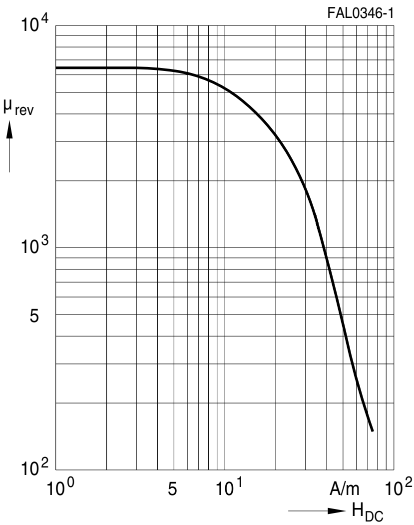
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



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



DC magnetic bias
(measured on RM cores, typical values)
($\hat{B} \leq 0.25$ mT, f = 10 kHz, T = 25 °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.

EPCOS

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application.**

   As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.

2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.

3. **The warnings, cautions and product-specific notes must be observed**.

4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.

5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

   We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available.

   The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.

7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CSMP, CSSP, CTVS, DSSP, MiniBlue, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.