Based on IEC 60401, 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.

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1 Material application survey

Usage	Frequency range	Mate-rial	Specific application	Core type
High Q inductors in resonant circuits and filters	up to 0,1 MHz	N 48	Filters in telephony, MW IF filters	Gapped P and RM cores, adjusting cores
	0,2 – 1,6 MHz	M 33		
	1,5 – 12 MHz	K 1		
Broadband transformers (e.g. antenna transformers, ISDN transformers, digital data transformers (xDSL, LAN)	up to 3 MHz	T 56	Impedance and matching transformers (ISDN, xDSL using paired core shapes with air gap)	Toroids
		T 46		
		T 42		EP, RM, TT/PR, toroids
		T 38		
	up to 5 MHz	N 26	Radio-frequency transformers	Double aper-ture, toroids
	up to 10 MHz	M 33		
	up to 100 MHz	T 57	LAN (also suitable for xDSL in paired core shapes)	Toroids
	up to 100 MHz	M 33	Balun transformers	Double aper-ture, toroids
		K 1		
Electromagnetic Interference (EMI)	up to 3 MHz	T 38	Current-compensated chokes	DE, toroids
		T 37		
		T 35		
		T 65		
	up to 5 MHz	N 30		
	up to 100 MHz	M 13	Line attenuation, current-compensated chokes	Toroids
		K 6		
		K 7		
		K 8		
		K 10		
Sensors, ID systems	up to 1 MHz	N 22	Inductive proximity switches	P core halves
	up to 2 MHz	M 33		
	up to 100 MHz	FPC		

Usage	Frequency range	Material	Specific application	Core type
Medium and high frequency switch-mode power supplies	up to 100 kHz	N 27	Power transformers and chokes	E, ETD, ER, EFD, EV, ELP, RM, RM LP, PM
	up to 500 kHz	N 87		
		N 97		
	300 kHz to 1 MHz	N 49		
	up to 100 kHz	N 41	Chokes	E, ETD, ER, EFD, EV, ELP, RM, RM LP, PM
	up to 500 kHz	N 92	High voltage transformers and power chokes	
	up to 200 kHz	N 72	Electronic lamp ballast devices	E, ETD

LP = Low Profile

2 Material properties

Preferred application			Resonant Circuit inductors			Inductors for line attenuation	
Material			K 1	M 33[1]	N 48	K 10	K 8
Base material			NiZn	MnZn	MnZn	NiZn	NiZn
Color code (adjuster)			violet	white	—	—	—
	Symbol	Unit					
Initial permeability (T = 25 °C)	μ_i		80 ± 25 %	750 ± 25 %	2300 ± 25 %	800 ± 25 %	860 ± 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	2000 400 310	1200 420 310	5000 320 240	1200 340 240
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	380 350	80 65	26 19	40 25	40 25
Optimum frequency range	f_{min} f_{max}	MHz	1,5 … 12	0,2 … 1,0	0,001 … 0,1	0,1 … 1	0,1 … 0,5
Relative loss factor at f_{min} at f_{max}	$\tan \delta/\mu_i$	10^{-6} 10^{-6}	< 40 < 120	< 12 < 20	< 2,7 < 4,2	< 15 < 60	< 20 < 30
Hysteresis material constant	η_B	10^{-6}/mT	< 36	< 1,8	< 0,4	< 5	< 4,5
Curie temperature	T_C	°C	> 400	> 200	> 170	> 150	> 150
Relative temperature coefficient at 25 ... 55 °C at 5 ... 25 °C	α_F	10^{-6}/K	2 … 8 7 … 1	0,5 … 2,6 —	0,3 … 1,3 0,3 … 1,3	— —	— —
Mean value of α_F at 25 ... 55 °C		10^{-6}/K	4	1,6	0,70	10,0	9,2
Density (typical values)		kg/m^3	4650	4500	4700	5000	5100
Disaccommodation factor at 25 °C	DF	10^{-6}	20	8	2	—	—
Resistivity	ρ	Ωm	10^5	5	3	10^5	10^5
Core shapes			RM, P, Toroid, P core half	RM, P, Toroid, Double-aperture, P core-half	RM, P	Toroid, Double-aperture	Toroid
Other material properties (graphs) see page			50	57	70	55	54

1) For threaded cores μi = 600 ± 20%

Material properties (continued)

Preferred application			Inductors for line attenuation			Proximity switch
Material			K 6	K 7	M 13	N 22
Base material			NiZn	NiZn	NiZn	MnZn
Color code (adjuster)			—	—	—	red
	Symbol	Unit				
Initial permeability (T = 25 °C)	μ_i		1000 ± 25 %	1500 ± 25 %	2300 ± 25 %	2300 ± 25 %
Meas. field strength Flux density (near saturation) (f = 10 kHz)	H B_S (25 °C) B_S (100 °C)	A/m mT mT	1200 270 180	1200 280 150	1200 280 135	1200 370 260
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	43 32	24 17	12 8	18 14
Optimum frequency range	f_{min} f_{max}	MHz	0,1 … 0,5	0,1 … 0,5	0,001 … 0,1	0,001 … 0,2
Relative loss factor at f_{min} at f_{max}	$\tan \delta/\mu_i$	10^{-6} 10^{-6}	< 20 < 40	< 15 < 60	< 5 < 20	< 2 < 20
Hysteresis material constant	η_B	10^{-6}/mT	< 4,0	< 4,0	< 4,0	< 1,4
Curie temperature	T_C	°C	> 130	> 110	> 105	> 145
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	3,7	3,5	3,7	0,9
Density (typical values)		kg/m³	5100	5150	5200	4700
Disaccommodation factor at 25 °C	DF	10^{-6}	—	—	—	4
Resistivity	ρ	Ωm	10^7	$5 \cdot 10^6$	10^5	1
Core shapes			Toroid	Toroid	Toroid, Double-aperture	P core half
Other material properties (graphs) see page			52	53	56	59

Material properties (continued)

Preferred application			Broadband transformers			
Material			N 26	T 57	N 30	T 65
Base material			MnZn	MnZn	MnZn	MnZn
	Symbol	Unit				
Initial permeability (T = 25 °C)	μ_i		2300 ± 25 %	4000 ± 25 %	4300 ± 25 %	5200 ± 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 380 260	1200 430 270	1200 380 240	1200 460 320
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	23 17	14 12	12 8	12 11
Optimum frequency range	f_{min} f_{max}	MHz	0,001 … 0,1	0,01 … 0,5	0,01 … 0,40	0,01 … 0,20
Relative loss factor at f_{min} at f_{max}	$\tan \delta/\mu_i$	10^{-6} 10^{-6}	< 2,8 < 3,8	< 5 < 70	< 2 < 60	< 1,5 < 25
Hysteresis material constant	η_B	10^{-6}/mT	< 0,3	< 0,3	< 1,1	< 1,1
Curie temperature	T_C	°C	> 130	> 140	> 130	> 160
Relative temperature coefficient at 25 ... 55 °C at 5 ... 25 °C	α_F	10^{-6}/K	0 … 1,5 0 … 1,8	— —	— —	— —
Mean value of α_F at 25 ... 55 °C		10^{-6}/K	1,0	0,5	0,6	– 0,5
Density (typical values)		kg/m³	4700	4930	4800	4930
Disaccommodation factor at 25 °C	DF	10^{-6}	—	—	—	—
Resistivity	ρ	Ωm	2	3	0,5	0,30
Core shapes			RM, P, EP	RM, P, EP, Toroid	RM, P, EP, E, Toroid, Double-aperture	RM, P, Toroid, EP
Other material properties (graphs) see page			60	102	65	104

Material properties (continued)

Preferred application			Broadband transformers		
Material			T 35	T 37	T 38[1]
Base material			MnZn	MnZn	MnZn
	Symbol	Unit			
Initial permeability (T = 25 °C)	μ_i		6000 ± 25 %	6500 ± 25 %	10000 ± 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 390 270	1200 380 240	1200 430 260
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	12 9	9 8	8 7
Optimum frequency range	f_{min} f_{max}	MHz	0,01 … 0,20	0,01 … 0,30	0,01 … 0,10
Relative loss factor at f_{min} at f_{max}	$\tan\delta/\mu_i$	10^{-6} 10^{-6}	< 4 < 60	< 2 < 60	< 2,0 < 20
Hysteresis material constant	η_B	10^{-6}/mT	< 1,1	< 1,1	< 0,3
Curie temperature	T_C	°C	> 130	> 130	> 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	0,8	– 0,3	– 0,2
Density (typical values)		kg/m^3	4900	4900	4950
Disaccommodation factor at 25 °C	DF	10^{-6}	—	—	—
Resistivity	ρ	Ωm	0,2	0,2	0,1
Core shapes			RM, P, EP, Toroid	Toroid, DE	RM, P, EP, ER, Toroid, TT/PR, E
Other material properties (graphs) see page			90	92	94

1) Improved, new data

Material properties (continued)

Preferred application			Broadband transformers		
Material			T 42[1]	T 46[1]	T 56[1]
Base material			MnZn	MnZn	MnZn
	Symbol	Unit			
Initial permeability (T = 25 °C)	μ_i		12000 ± 30 %	15000 ± 30 %	20000 ± 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 400 250	1200 400 240	400 350 250
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	7 6	7 6	6 5
Optimum frequency range	f_{min} f_{max}	MHz	0,01 … 0,10	0,01 … 0,10	0,01 … 0,10
Relative loss factor at f_{min} at f_{max}	tan δ/μ_i	10^{-6} 10^{-6}	< 2 < 20	< 8 < 100	< 10 < 60
Hysteresis material constant	η_B	10^{-6}/mT	< 1,4	< 2,0	< 1,5
Curie temperature	T_C	°C	> 130	> 130	> 90
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	– 0,3	– 0,6	0,22
Density (typical values)		kg/m^3	4950	5000	5040
Disaccommodation factor at 25 °C	DF	10^{-6}	—	—	—
Resistivity	ρ	Ωm	0,1	0,01	0,1
Core shapes			RM, EP	Toroid	Toroid
Other material properties (graphs) see page			96	98	100

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

Material properties (continued)

Preferred application			Power transformers			
Material			N 49[1]	N 92	N 27	N 67[2]
Base material			MnZn	MnZn	MnZn	MnZn
	Symbol	Unit				
Initial permeability (T = 25 °C)	μ_i		1500 ± 25 %	1500 ± 25 %	2000 ± 25 %	2100 ± 25 %
Flux density (H = 1200 A/m, f = 10 kHz)	B_S (25 °C) B_S (100 °C)	mT mT	490 400	500 440	500 410	480 380
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m A/m	38 33	24 13	23 19	20 14
Typical frequency range		kHz	300 … 1000	25 … 500	25 … 150	25 … 300
Hysteresis material constant	η_B	10^{-6}/mT	< 0,4	< 1,4	< 1,5	< 1,4
Curie temperature	T_C	°C	> 240	> 280	> 220	> 220
Mean value of α_F at 25 … 55 °C		10^{-6}/K	—	—	3	4
Density (typical values)		kg/m^3	4800	4850	4750	4800
Relative core losses (typical values)	P_V					
25 kHz, 200 mT, 100 °C		kW/m^3	—	70	155	80
100 kHz, 200 mT, 100 °C		kW/m^3	—	410	920	525
300 kHz, 100 mT, 100 °C		kW/m^3	330	410	—	560
500 kHz, 50 mT, 100 °C		kW/m^3	80	230	—	—
1 MHz, 50 mT, 100 °C		kW/m^3	475	—	—	—
Resistivity	ρ	Ωm	17	8	3	6
Core shapes			RM, EFD, ELP, Toroid	RM, ETD, EFD, ER, E, ELP, Toroid	P, PM, ETD, EC, ER, E, U, Toroid	ETD, EFD, E
Other material properties (graphs) see page			72	84	62	75

1) Improved, new data
2) Not for new design

Material properties (continued)

Preferred application			Power transformers			
Material			N 87[1]	N 97	N 72	N 41
Base material			MnZn	MnZn	MnZn	MnZn
	Symbol	Unit				
Initial permeability (T = 25 °C)	μ_i		2200 ± 25 %	2300 ± 25 %	2500 ± 25 %	2800 ± 25 %
Flux density (H = 1200 A/m, f = 10 kHz)	B_S (25 °C) B_S (100 °C)	mT mT	490 390	510 410	480 370	490 390
Coercive field strength (f = 10 kHz)	H_c (25 °C) H_c (100 °C)	A/m	21 13	21 12	15 11	22 20
Typical frequency range		kHz	25 … 500	25 … 500	25 … 300	25 … 150
Hysteresis material constant	η_B	10^{-6}/mT	< 1,0	< 1,0	< 1,4	< 1,4
Curie temperature	T_C	°C	> 210	> 230	> 210	> 220
Mean value of α_F at 25 … 55 °C		10^{-6}/K	4	4	3	4
Density (typical values)		kg/m³	4850	4920	4800	4800
Relative core losses (typical values)	P_V					
25 kHz, 200 mT, 100 °C		kW/m³	57	45	80	180
100 kHz, 200 mT, 100 °C		kW/m³	375	300	540	1400
300 kHz, 100 mT, 100 °C		kW/m³	390	340	500	—
500 kHz, 50 mT, 100 °C		kW/m³	215	205	—	—
1 MHz, 50 mT, 100 °C		kW/m³	—	—	—	—
Resistivity	ρ	Ωm	10	8	12	2
Core shapes			RM, TT, P, PM, ETD, EFD, E, ER, ELP, U Toroid	RM, PM, ETD, EFD, ER, E, ELP, Toroid	E, EFD	RM, P
Other material properties (graphs) see page			81	87	78	67

1) Improved, new data

Material properties (continued)

Preferred application			Injection-molded parts	Film	
Material			Ferrite Polymer Composite (FPC)		
Base material			C302	C350	C351
	Symbol	Unit			
Initial permeability f = 1 MHz	μ_i		17 ± 20 %	9 ± 20 %	9 ± 20 %
Flux density (near saturation) H = 25 kA/m f = 10 kHz	B_S (25 °C)	mT	330	255	255
Remanent induction H = 25 kA/m f = 10 kHz	B_r (25 °C)	mT	15	9	9
Coercive field strength H = 25 kA/m f = 10 kHz	H_C (25 °C)	A/m	770	600	600
Relative loss factor f = 1 MHz f = 100 MHz f = 1 GHz	$\tan\delta/\mu_i$		 < 0,0004 < 0,03 	 < 0,005 < 0,400	 < 0,005 < 0,400
Hysteresis material constant	η_B	10^{-3}/mT	< 0,25	< 2	< 2
Temperature coefficient	$\alpha=\Delta\mu/\mu\Delta T$	1/K	< 0,0002	$< 5 \cdot 10^{-5}$	$< 5 \cdot 10^{-5}$
Density		kg/m³	3500	2930	2930
Resistivity f = 1 kHz f = 10 kHz f = 10 MHz	ρ	Ωm	 21 13	 500 100	 500 100
Relative permittivity f = 1 kHz f = 10 kHz f = 10 MHz	ε_r		 280 100	 700 21	 700 21
Maximum operating temperature	T_{max}	°C	180	120	200
Dielectric strength		kV/mm	—	1	0,8
Tensile strength[1)]	σ_Z	N/mm²	—	1,5	2,5
Tearing resistance[1)]		%	—	25	25
Compressibility[1)]	κ	N/mm²	—	70	70
Other material properties (graphs) see page			49	—	—

1) T = 23 °C and 50 % relative humidity

3 Measuring conditions

The following measuring conditions, which correspond largely to IEC 60401, apply for the material properties given in the table:

Properties (valid only for ring cores of sizes R 10 to R 36)			Measuring conditions			
			Frequency kHz	Field strength (material-dependent) kA/m	Max. flux density mT	Temper-ature °C
Initial permeability	μ_i		≤ 10		≤ 0,25	25
Flux density near to saturation	B	mT	≤ 10	≥ 1,2		25; 100
Coercive field strength	H_c	A/m kA/m	≤ 10	≥ 1,2	near saturation	25; 100
Relative loss factor	$\tan \delta/\mu_i$		–		≤ 0,25	25
Hysteresis material constant	η_B	mT^{-1}	 10 ($\mu_i \geq 500$) 100 ($\mu_i < 500$)		B_1 B_2 1,5 3,0 0,3 1,2	25
Curie temperature	T_c	°C	≤ 10		≤ 0,25	
Relative temperature coefficient	α_F	10^{-6}/K	≤ 10		≤ 0,25	5 … 25 25 … 55
Density		kg/m^3				25
Disaccommodation factor	DF	10^{-6}	≤ 10		≤ 0,25	25; 60 1)
Resistivity	ρ	Ωm	DC			25

The following properties are given only for materials for power applications:

Power loss	P_V	kW/m^3	25 100 300 500 1000		200 200 100 50 50	100

1) Higher temperature than specified by IEC (40 °C)

4 Specific material data

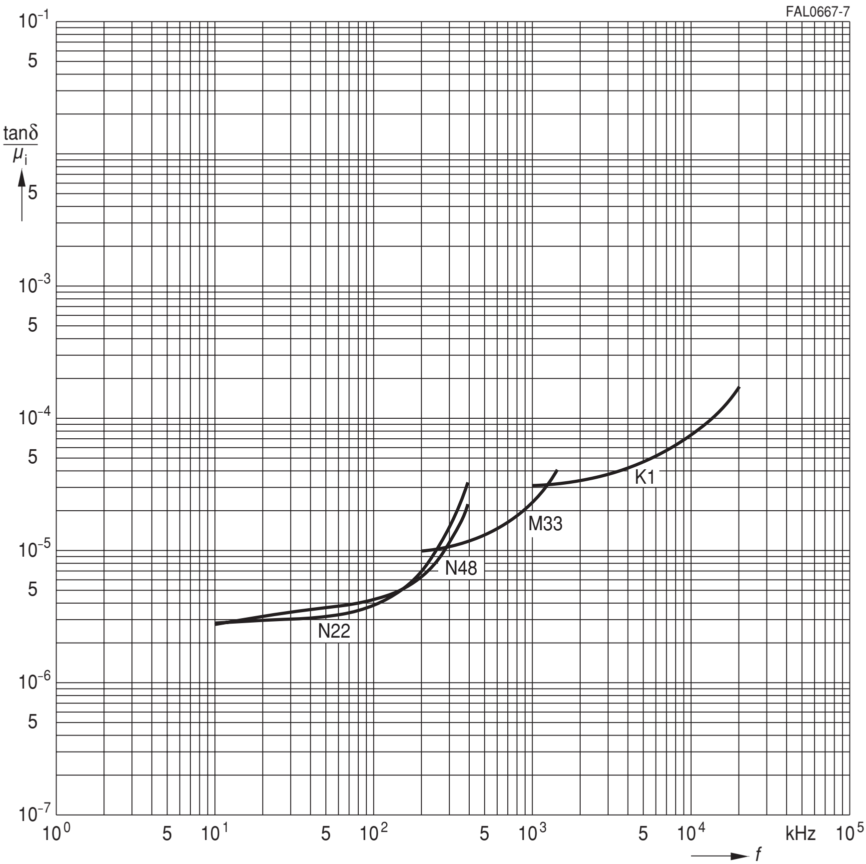
DC magnetic bias

$$H_{\_} = \frac{I_{\_} \cdot N}{l_e}$$

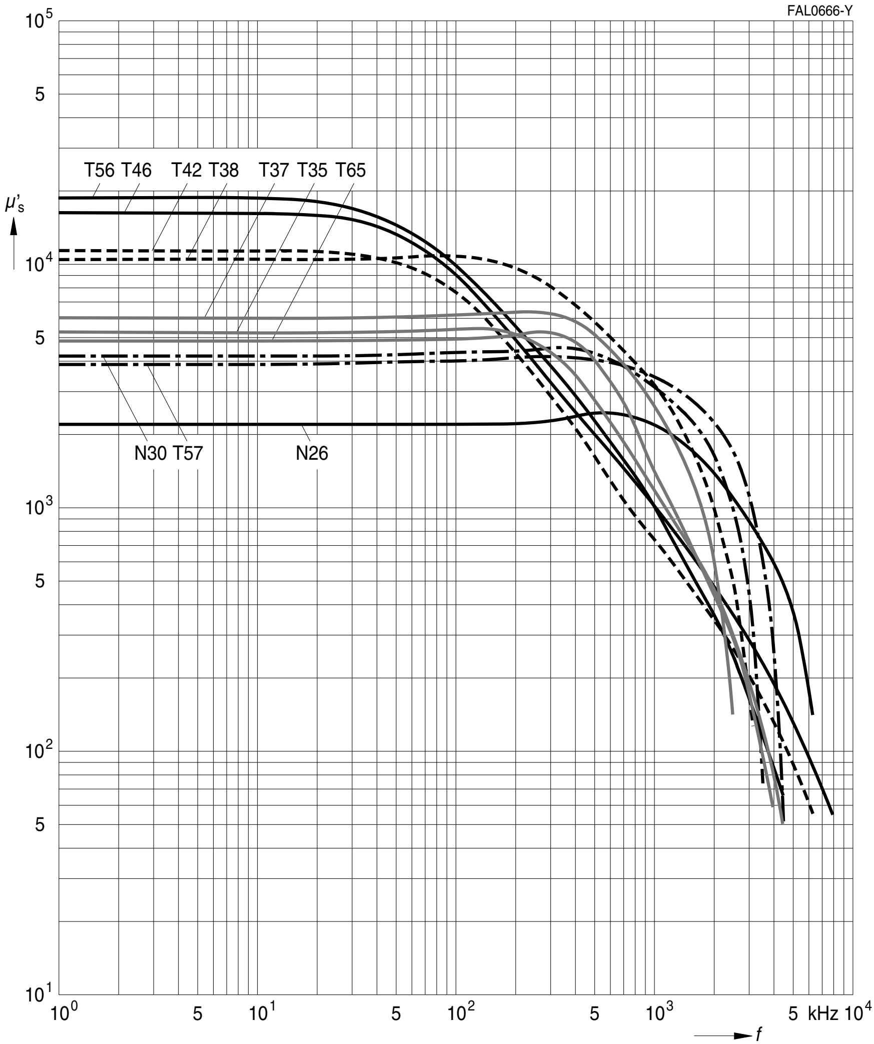
$H_{\_}$ = DC field strength [A/m]
$I_{\_}$ = Direct current [A]
N = Number of turns
l_e = Effective magnetic path length [m]

The curves of $\mu_{rev} = f(H_{\_})$ allow an approximate calculation of the variation in reversible permeability (μ_{rev}) and A_L value caused by magnetic bias. These curves are of particular interest for cores for transformers and chokes, since magnetic bias should be avoided if possible with inductors requiring high stability (filter inductors etc.). In the case of geometrically similar cores (i.e. in particular the same A_{min}/A_e ratio) the effective permeability of the core in question in conjunction with the given curves suffices to determine the reversible permeability to a close approximation.

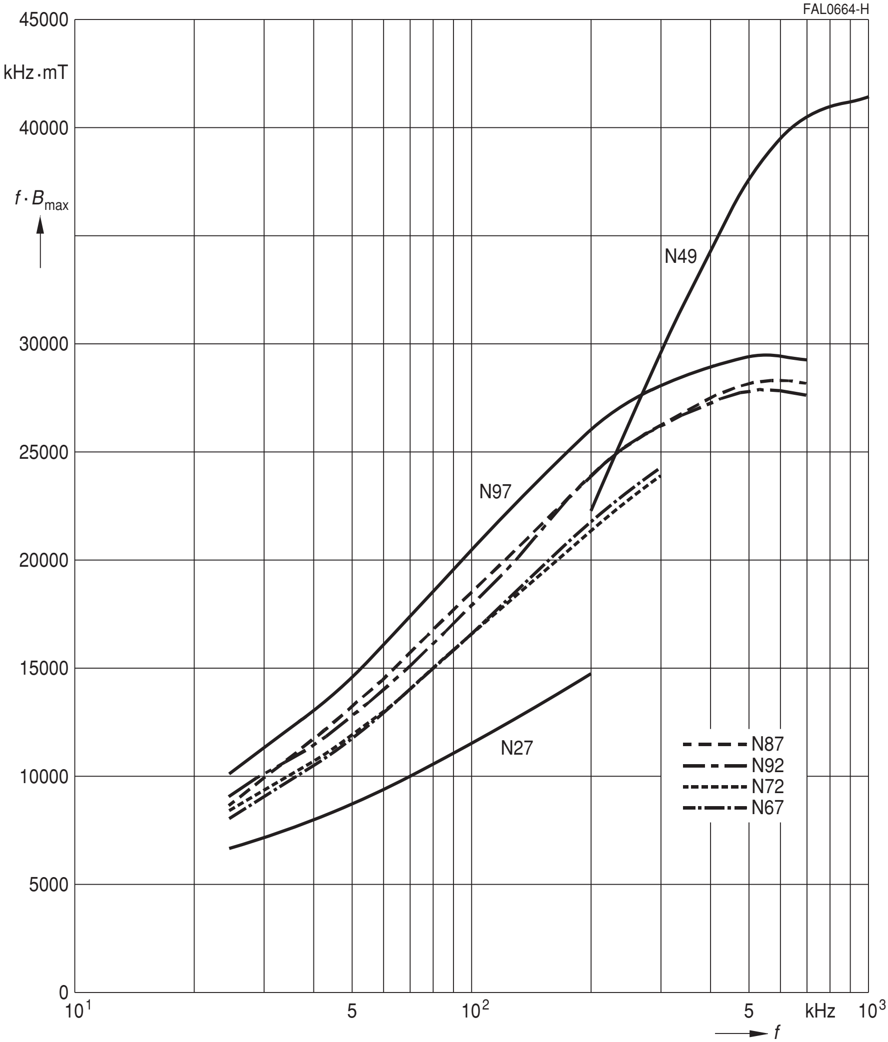
Relative loss factor versus frequency
(measured with ring cores, measuring flux density $\hat{B} \leq$ 0,25 mT)



Relative inductance component versus frequency
(measured with ring cores, measuring flux density $\hat{B}$ ≤0,25 mT)

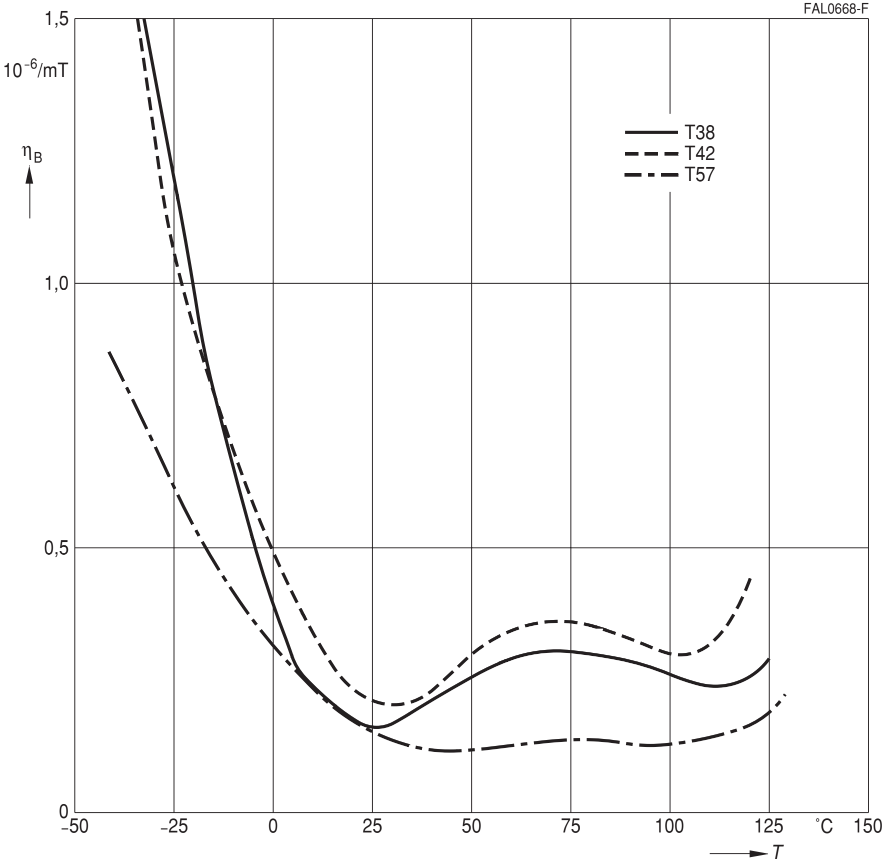


Performance factor versus frequency
(measured with ring cores R29, T = 100 °C, P_V = 300 kW/m³)



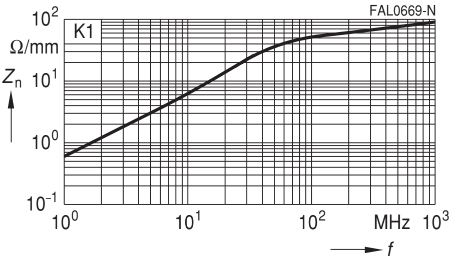
For definition of performance factor see page 116.

Standardized hysteresis material constant versus temperature

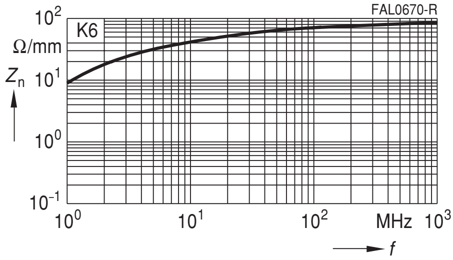


Normalized Impedance

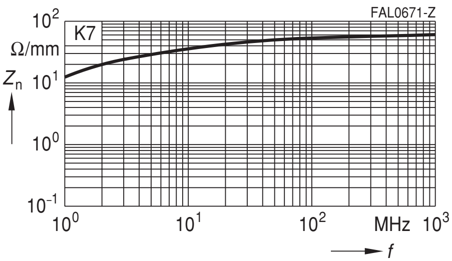
K 1



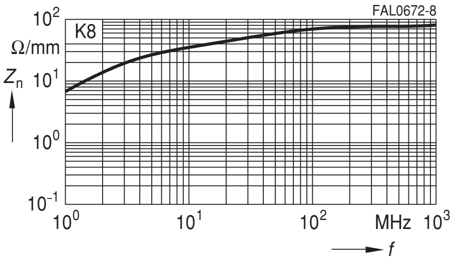
K 6



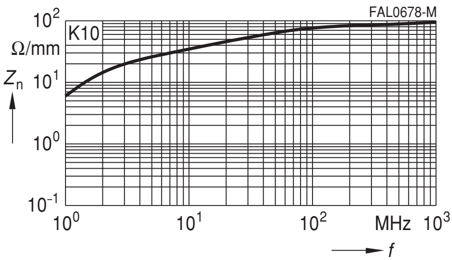
K 7



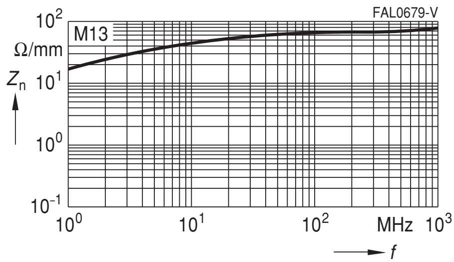
K 8



K 10

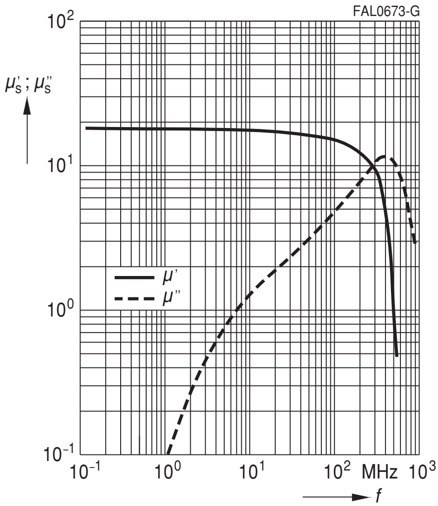


M 13

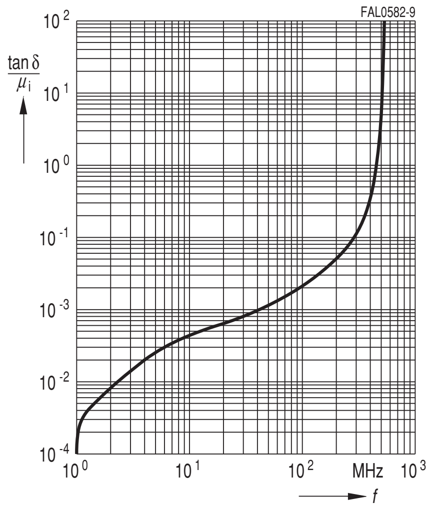


For explanation of Z_n see page 133.

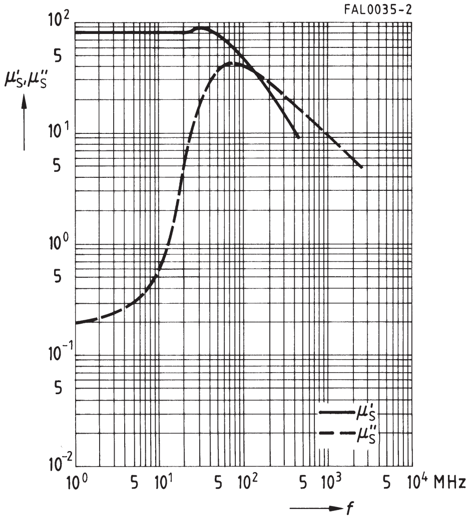
Complex permeability versus frequency
(measured on R20/10 toroids, $\hat{B} \leq 0{,}25$ mT)



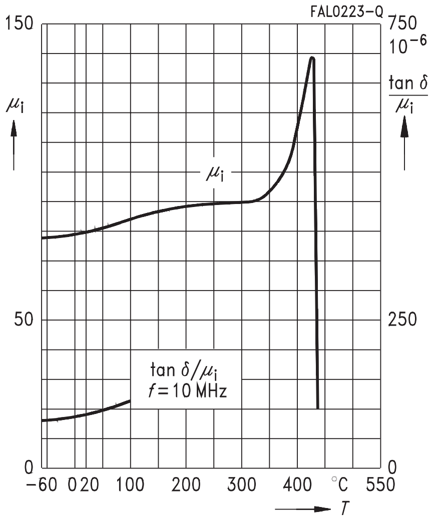
Relative loss factor versus frequeny
(measured on R20/10 toroids, $\hat{B} \leq 0{,}25$ mT)



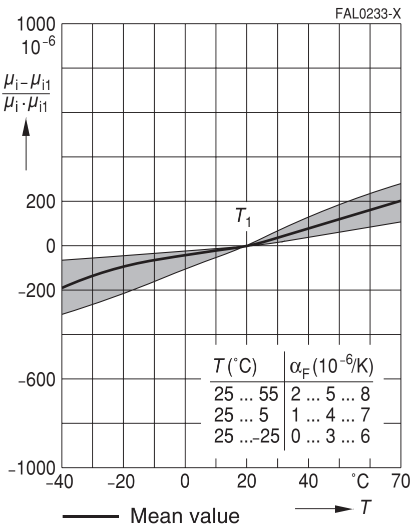
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



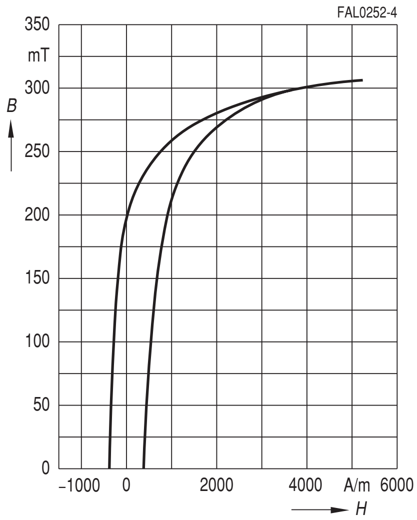
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



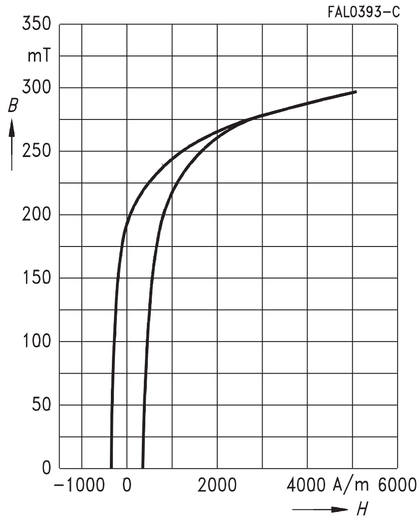
Permeability factor versus temperature
(measured on P and RM cores,
$\hat{B} \leq 0{,}25$ mT), $\mu_i \approx 80$



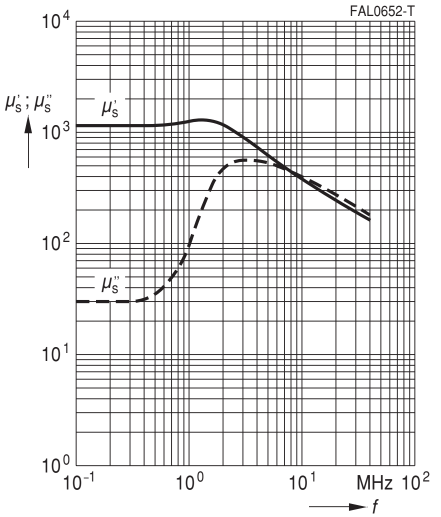
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



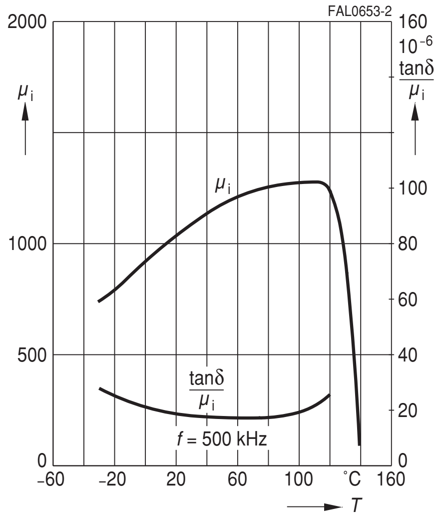
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T =100 °C)



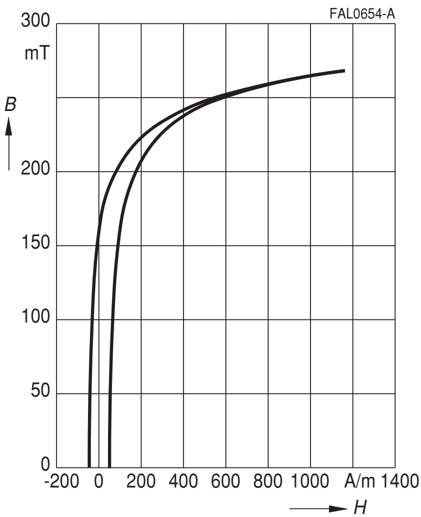
Complex permeability
versus frequency
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



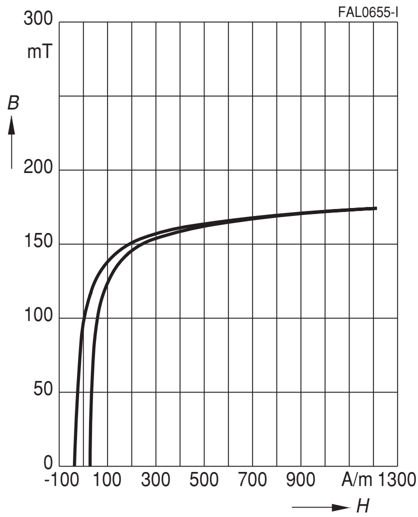
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



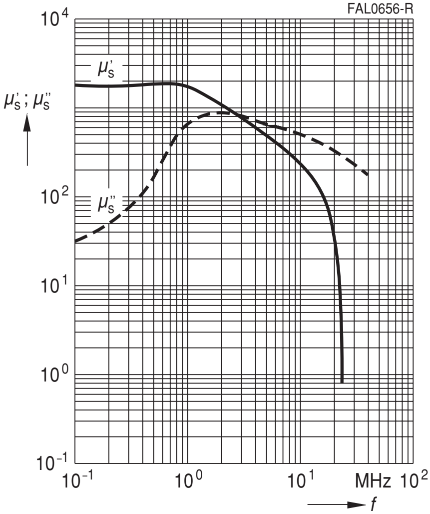
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



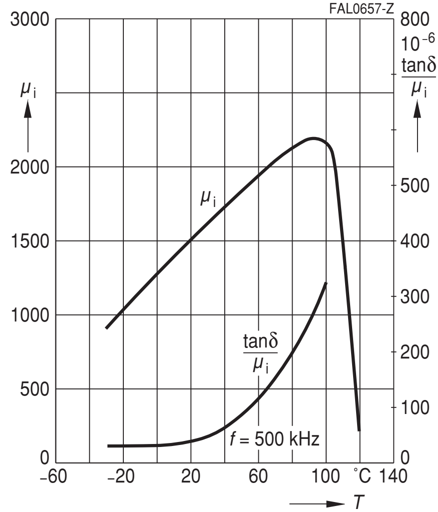
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T =100 °C)



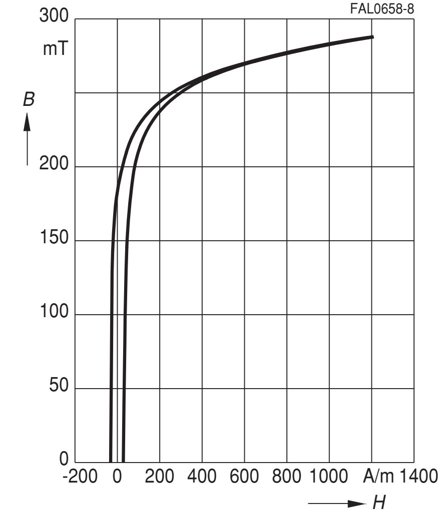
Complex permeability
versus frequency
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



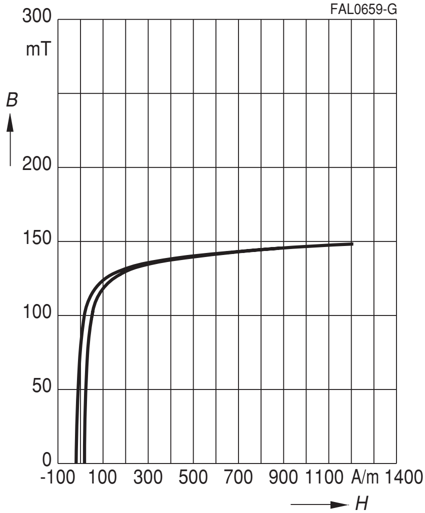
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



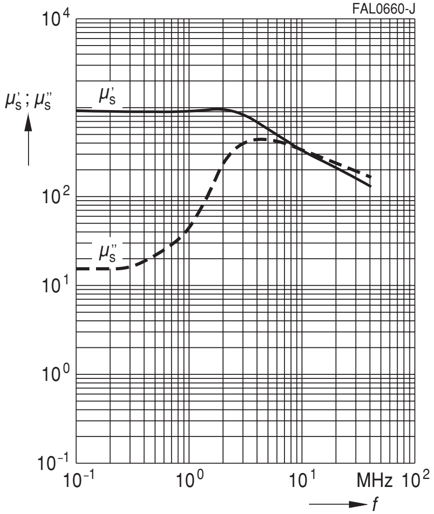
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



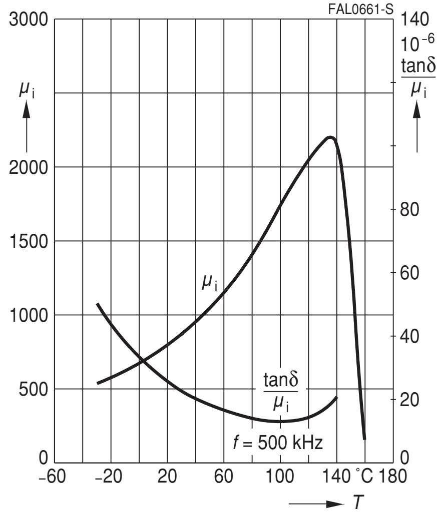
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T =100 °C)



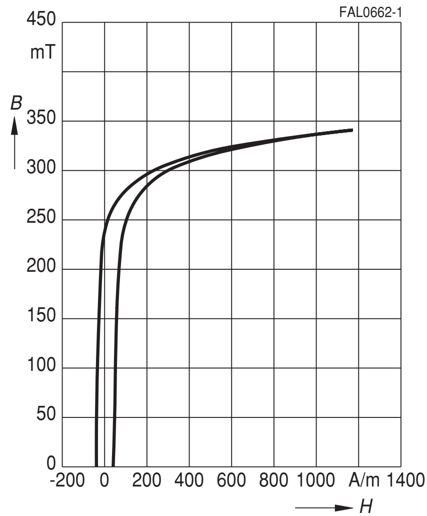
Complex permeability
versus frequency
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



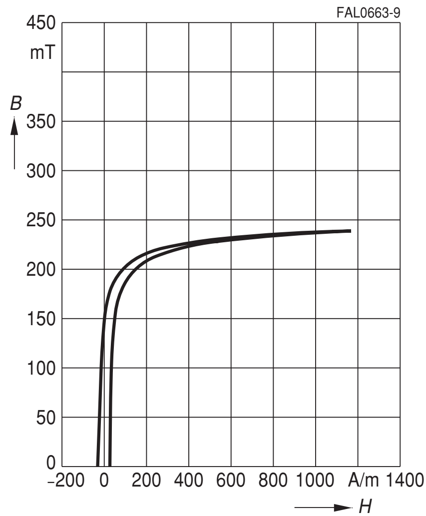
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



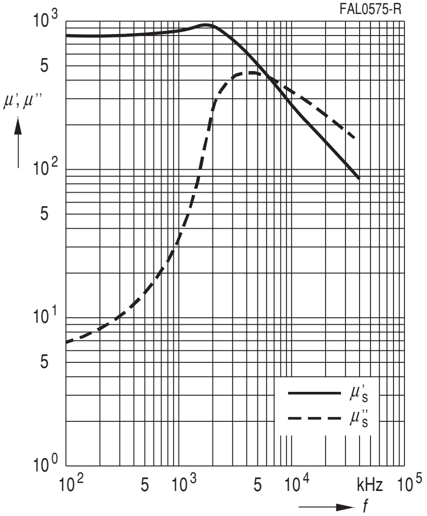
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



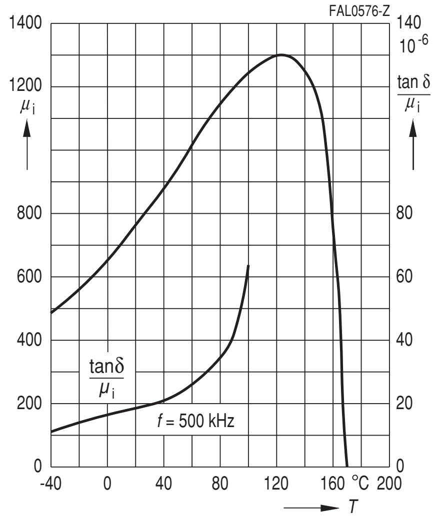
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T =100 °C)



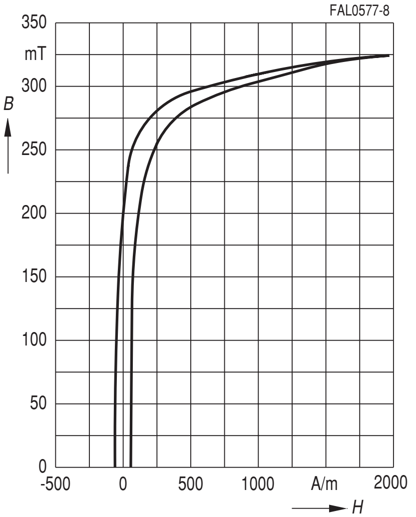
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



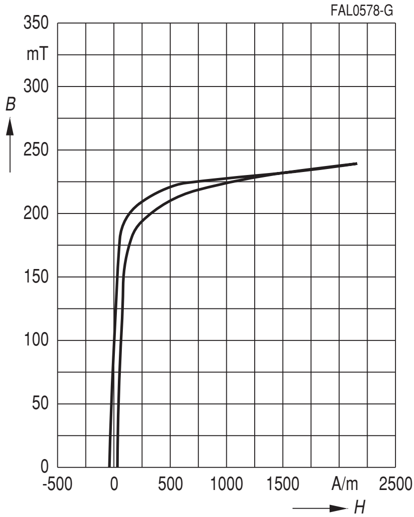
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



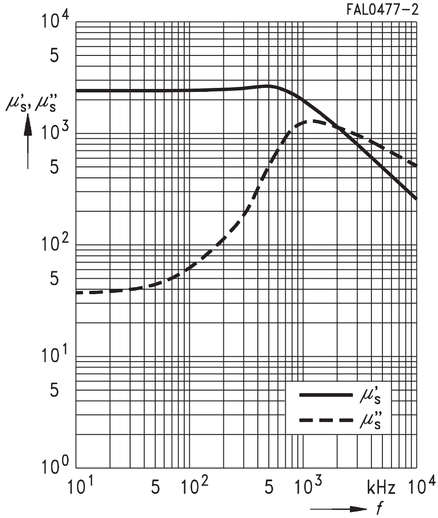
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



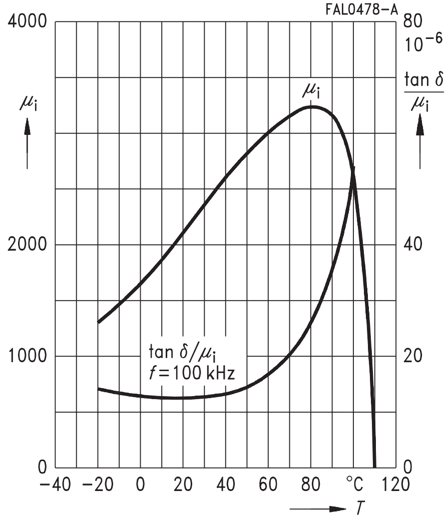
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



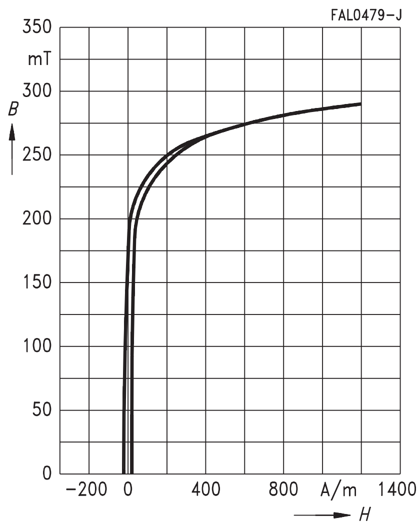
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



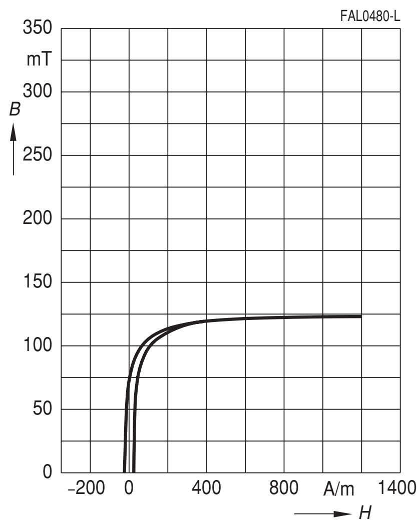
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R25 toroids, $\hat{B} \leq 0{,}25$ mT)



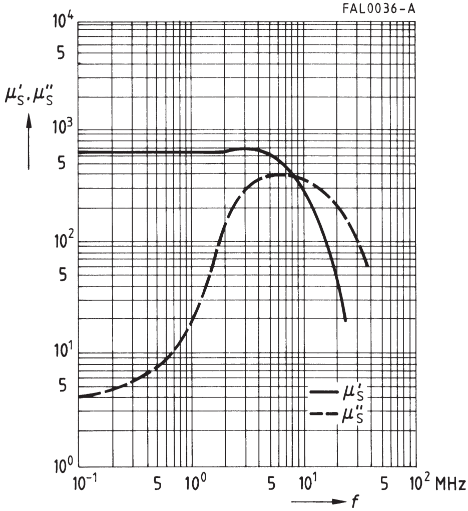
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



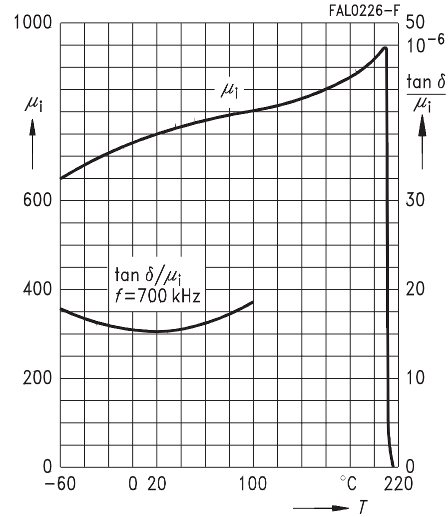
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



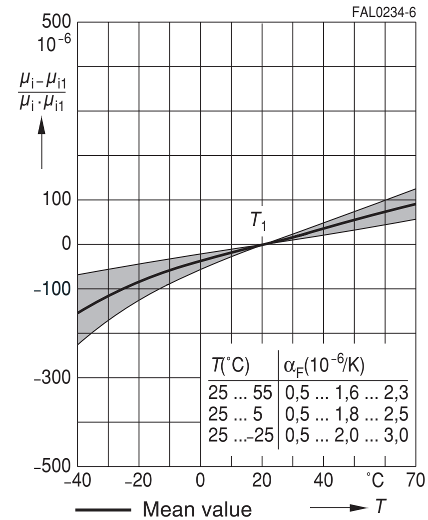
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



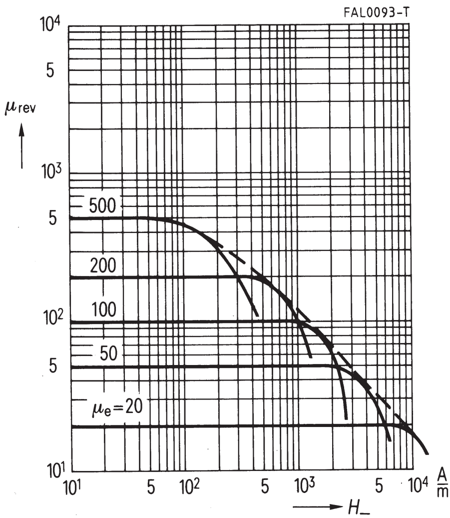
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



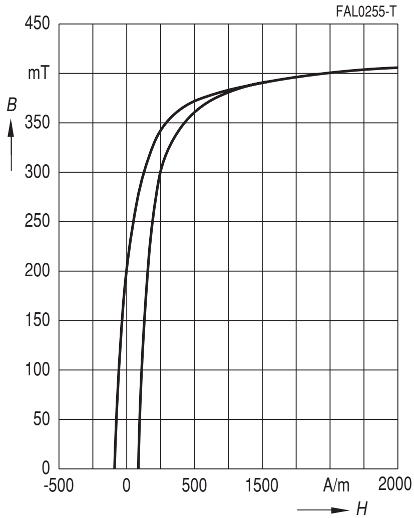
Permeability factor versus temperature
(measured on P and RM cores,
$\hat{B} \leq 0{,}25$ mT), $\mu_i \approx 750$



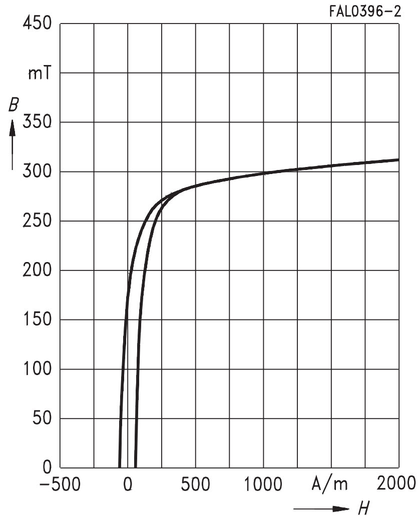
DC magnetic bias of P and RM cores
(typical values)
($\hat{B} \leq 0{,}25$ mT, f = 10 kHz, T = 25 °C)



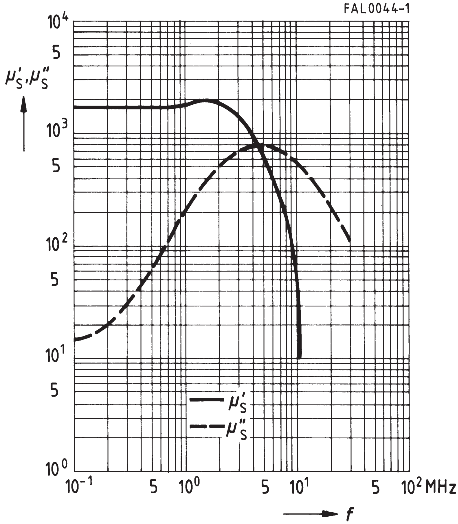
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



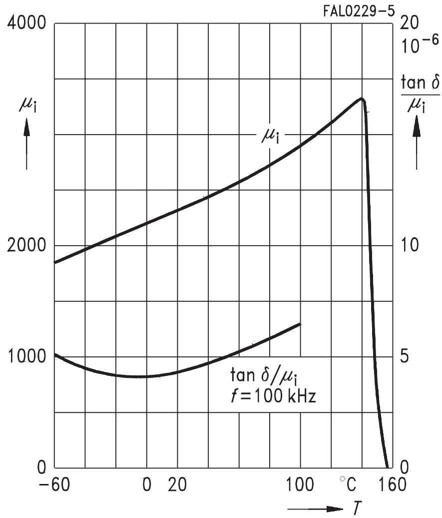
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



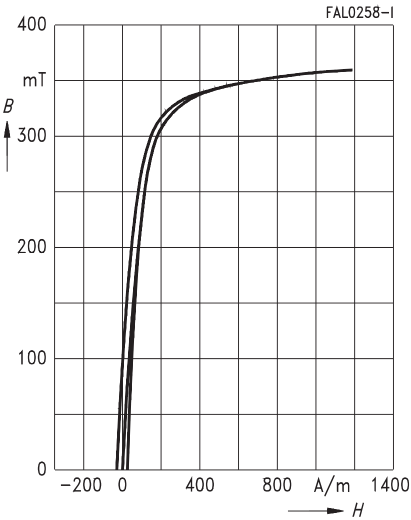
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



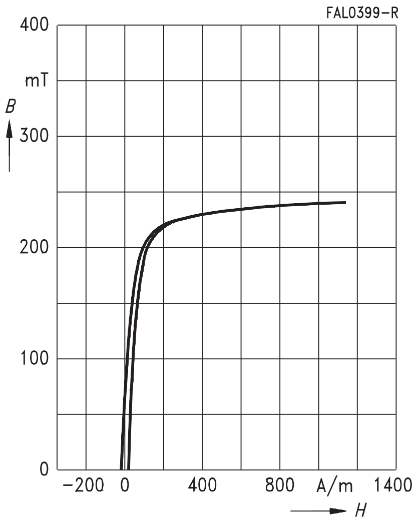
Initial permeability μ_i and relative loss factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



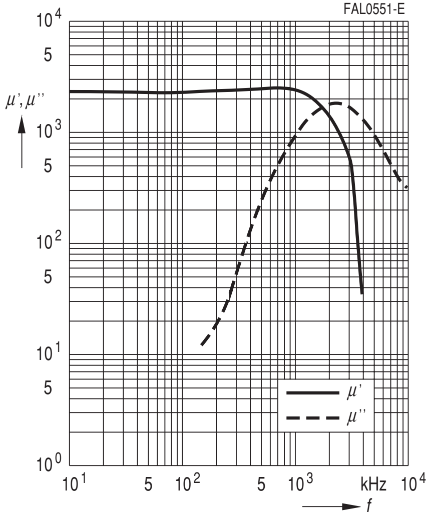
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



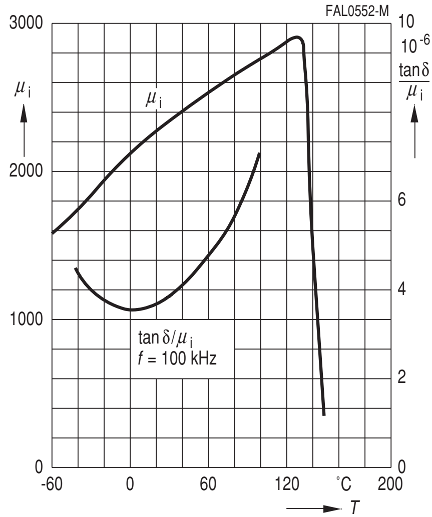
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



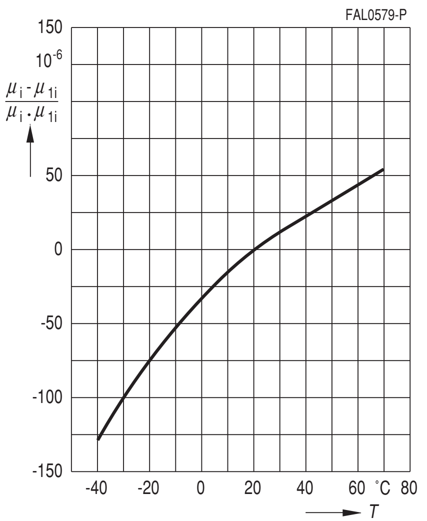
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



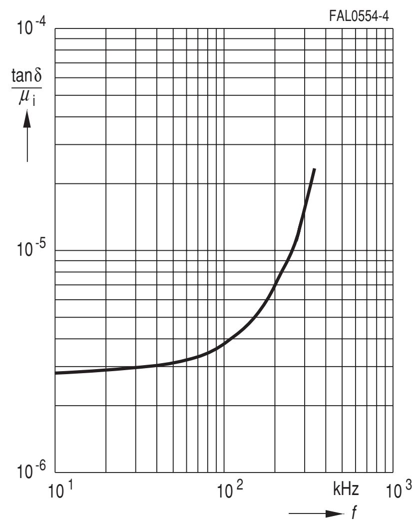
Initial permeability μ_i and relative los factor
tan δ/μ_i versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



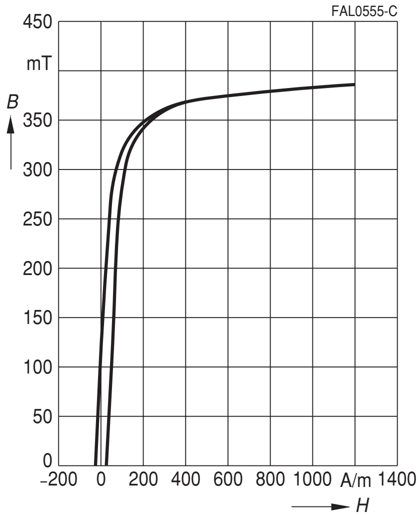
Permeability factor
versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



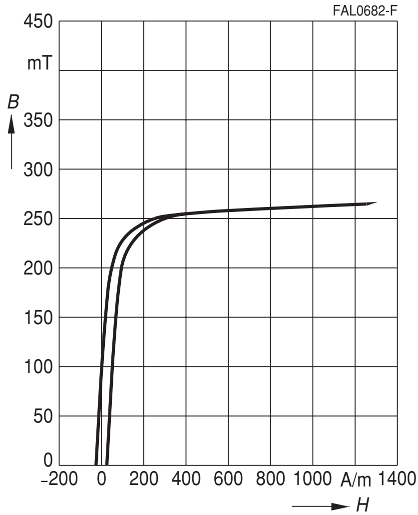
Relative loss factor
versus frequency
(measured on R14 toroids, $\hat{B} \leq 0{,}25$ mT)



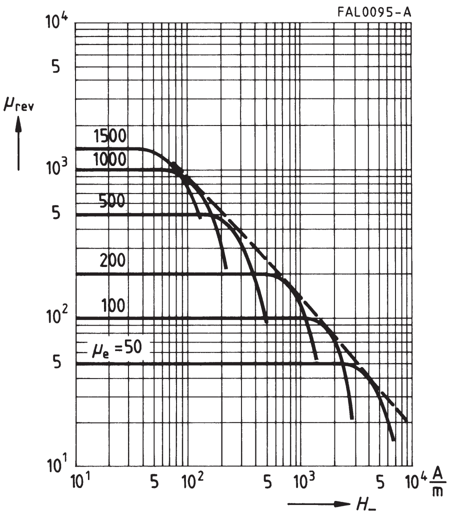
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



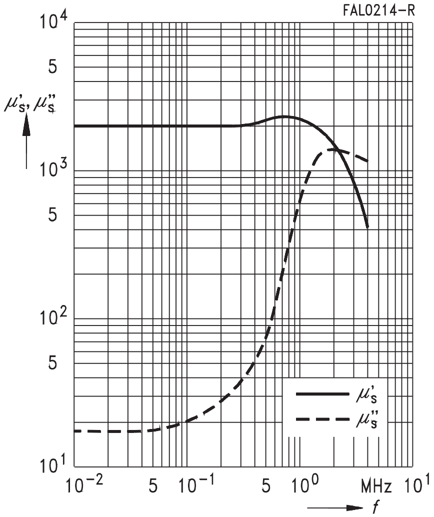
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



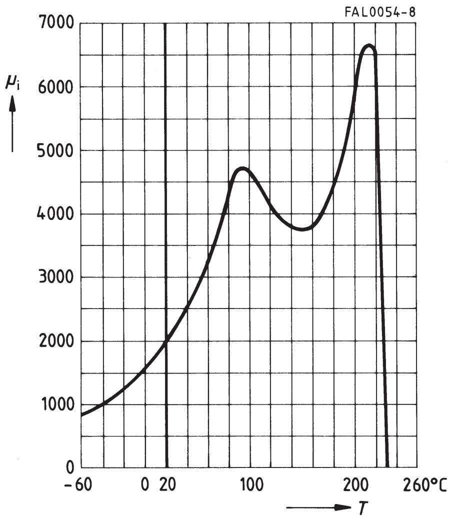
DC magnetic bias of P and RM cores
(typical values)
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



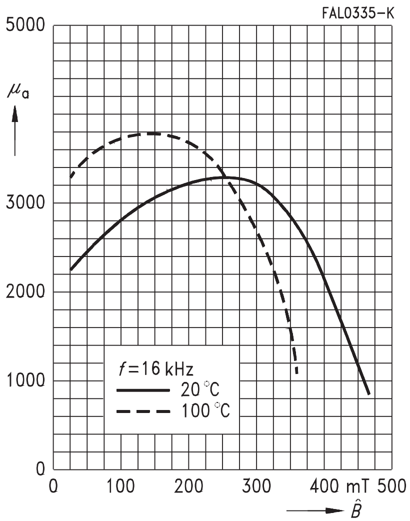
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq$ 0,25 mT)



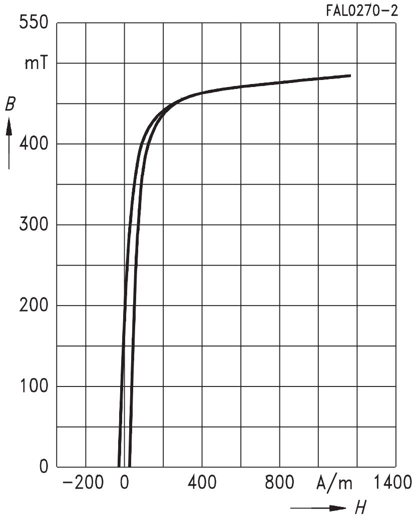
Initial permeability μ_i
versus temperature
(measured on R10 toroids, $\hat{B} \leq$ 0,25 mT)



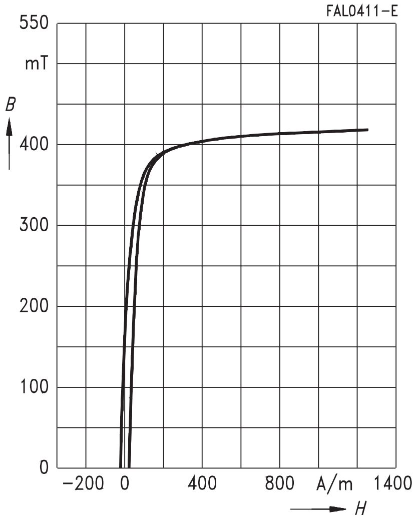
Amplitude permeability versus AC field
flux density
(measured on ungapped E cores)



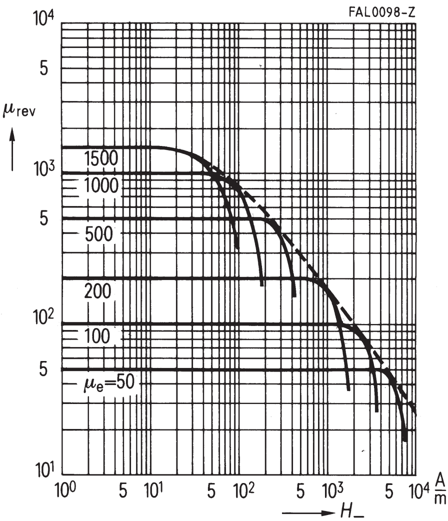
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



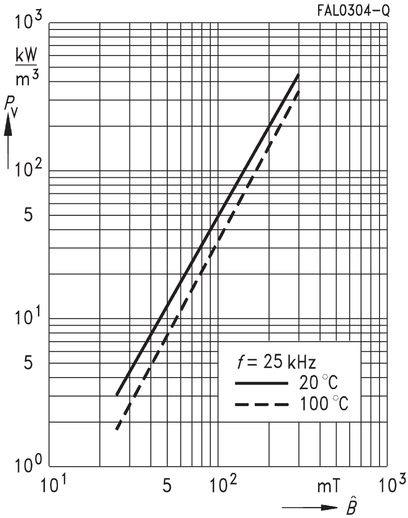
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



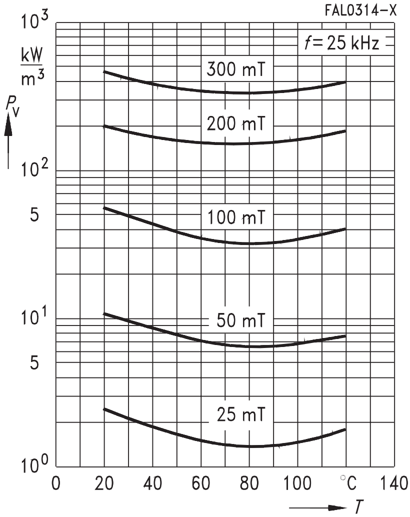
DC magnetic bias
measured on ETD cores
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



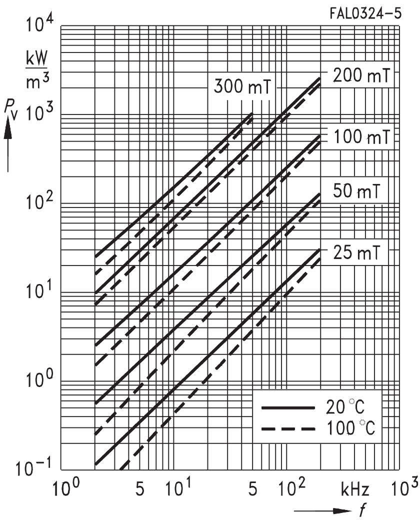
Relative core losses versus AC field flux density
(measured on R16 toroids)



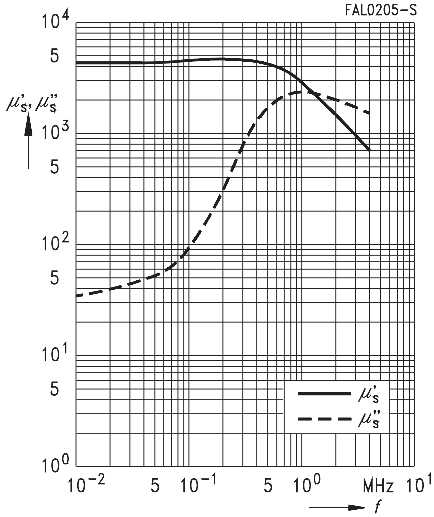
Relative core losses versus temperature
(measured on R16 toroids)



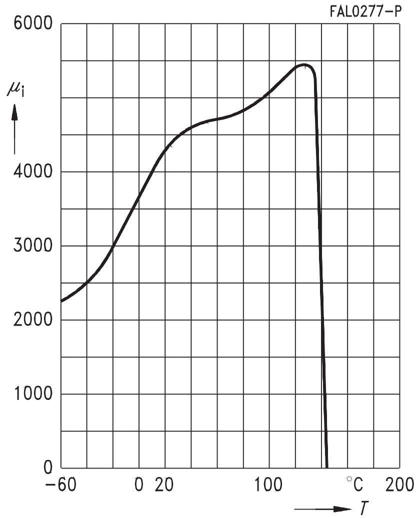
Relative core losses versus frequency
(measured on R16 toroids)



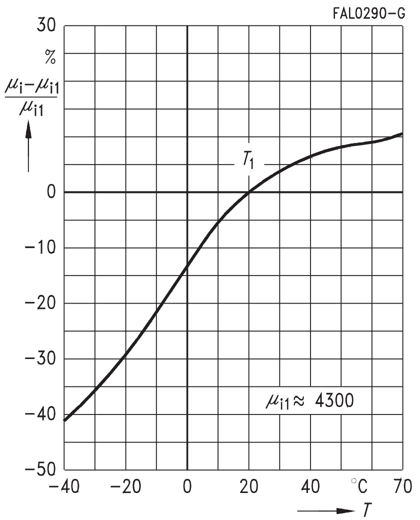
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



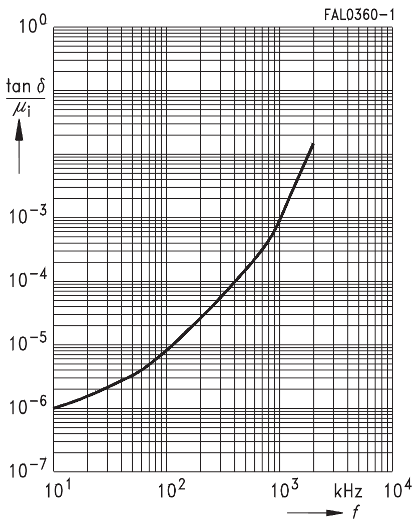
Initial permeability μ_i
versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



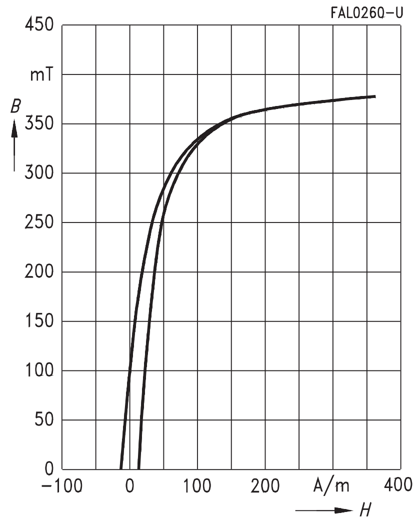
Variation of initial permeability
with temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



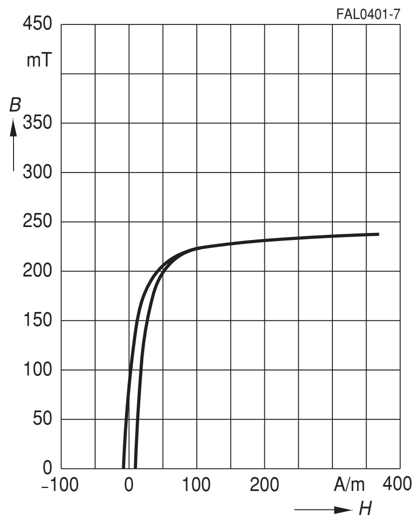
Relative loss factor
versus frequency
(measured on R20 toroids, $\hat{B} \leq 0{,}25$ mT)



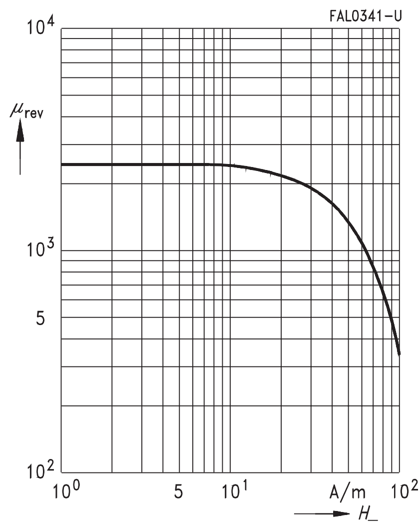
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



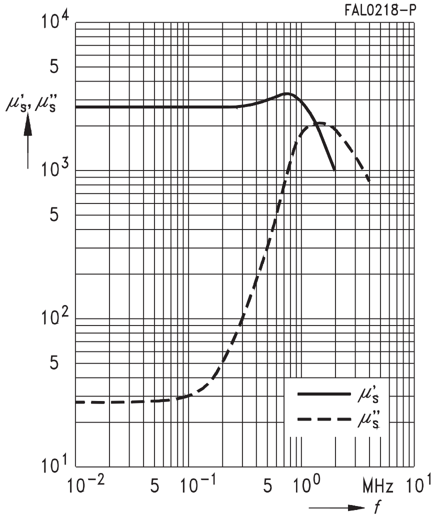
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



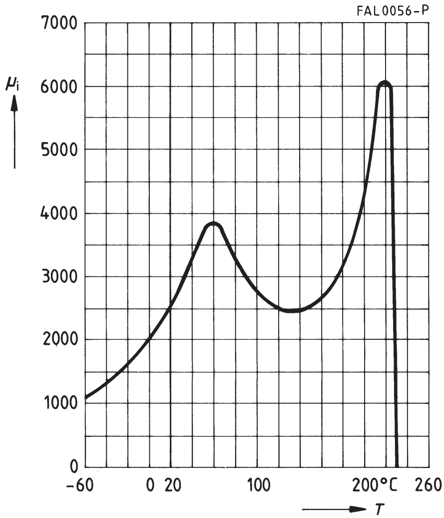
DC magnetic bias of RM cores
(typical values)
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



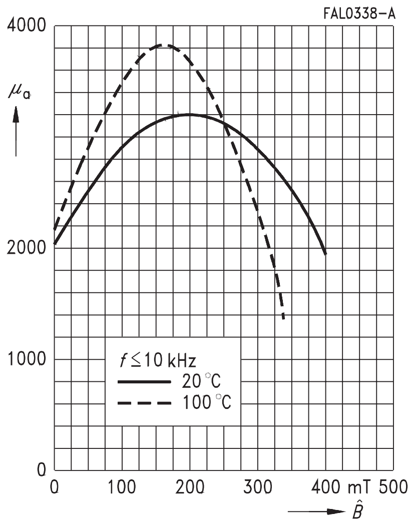
Complex permeability
versus frequency
(measured with R10 ring cores, $\hat{B} \leq 0{,}25$ mT)



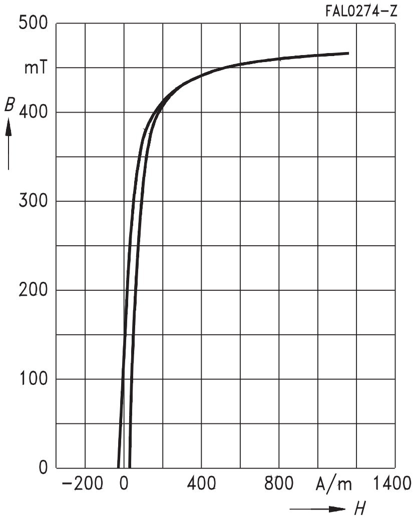
Initial permeability μ_i
versus temperature
(measured with R10 ring cores, $\hat{B} \leq 0{,}25$ mT)



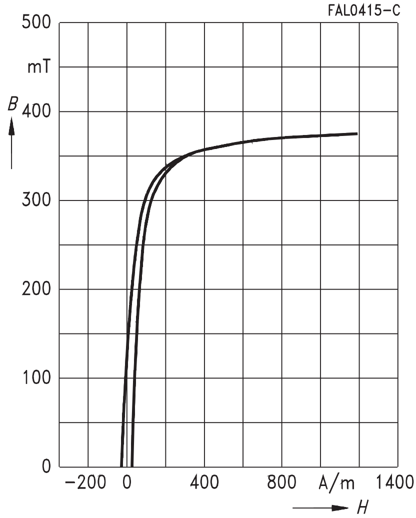
Amplitude permeability
versus AC field flux density
(measured on ungapped E cores)



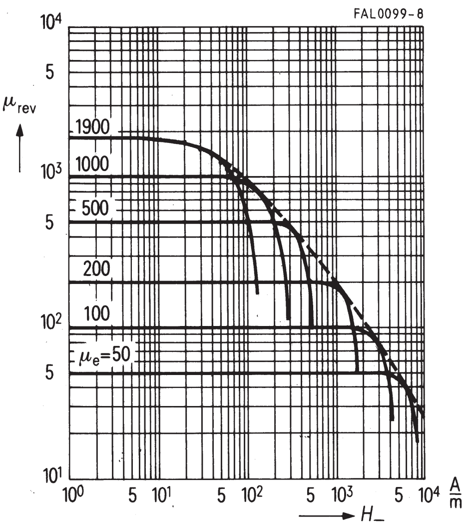
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



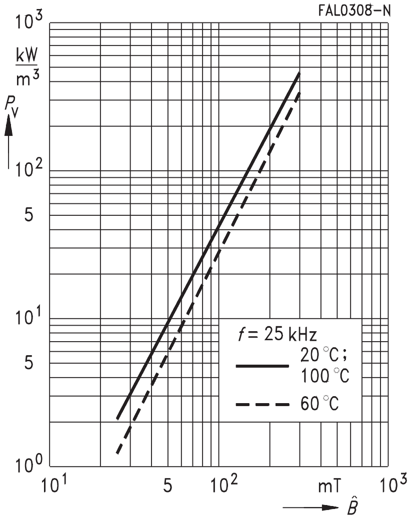
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



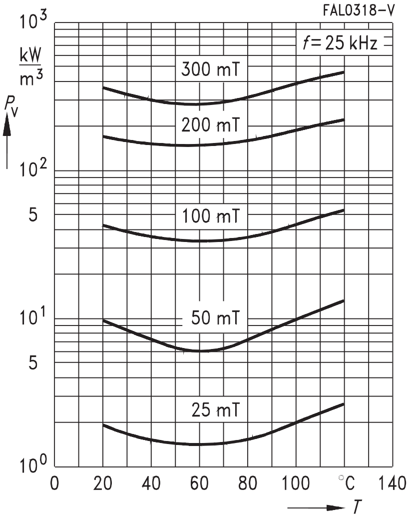
DC magnetic bias
of P and RM cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



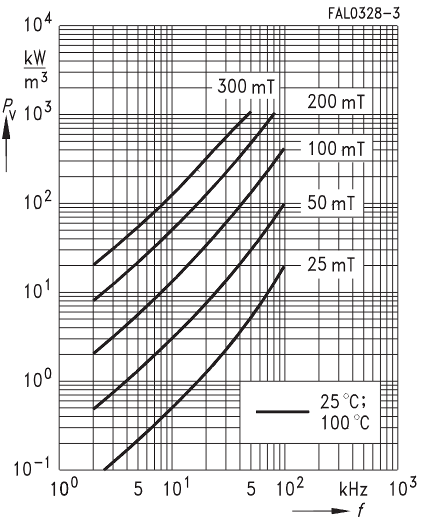
Relative core losses
versus AC field flux density
(measured on R16 toroids)



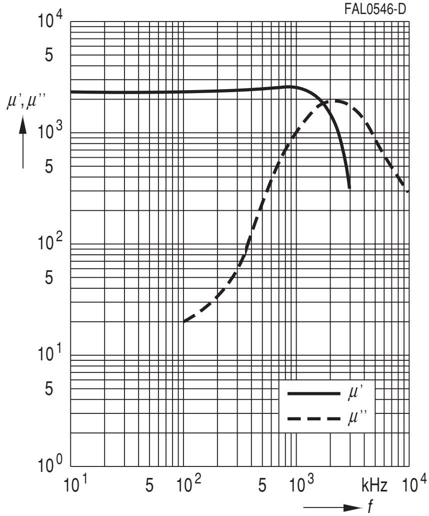
Relative core losses
versus temperature
(measured on R16 toroids)



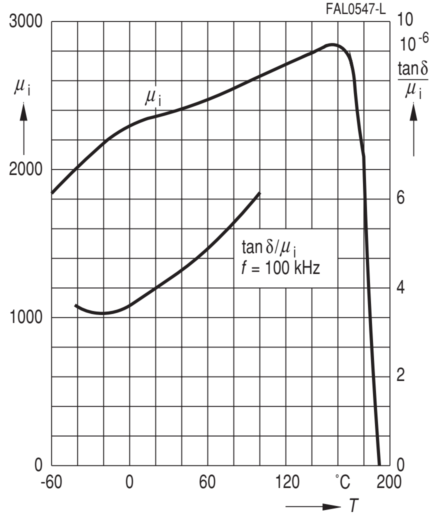
Relative core losses
versus frequency
(measured on R16 toroids)



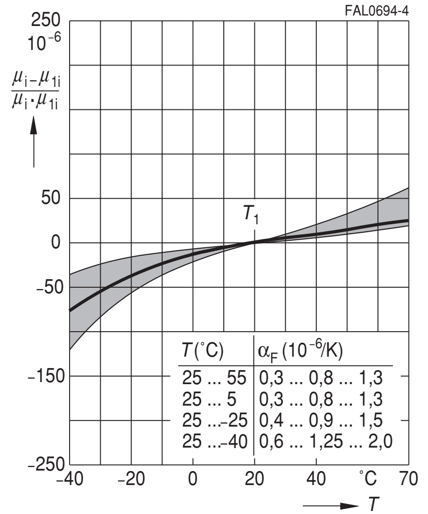
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



Initial permeability μ_i and relative loss factor $\tan\delta/\mu_i$ versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)

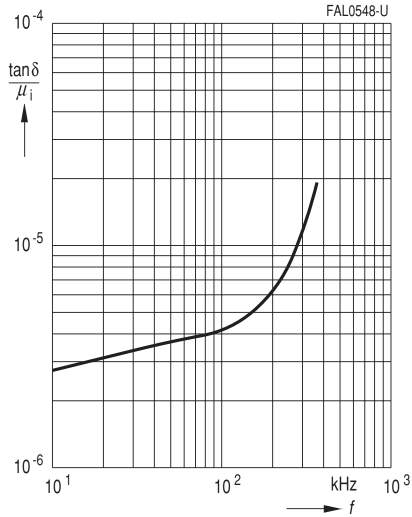


Permeability factor versus temperature
(measured on P and RM cores,
$\hat{B} \leq 0{,}25$ mT), $\mu_i \approx 2300$

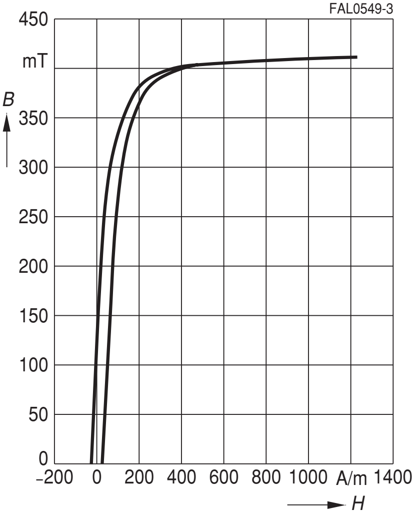


T (°C)	α_F (10^{-6}/K)
25 ... 55	0,3 ... 0,8 ... 1,3
25 ... 5	0,3 ... 0,8 ... 1,3
25 ...–25	0,4 ... 0,9 ... 1,5
25 ...–40	0,6 ... 1,25 ... 2,0

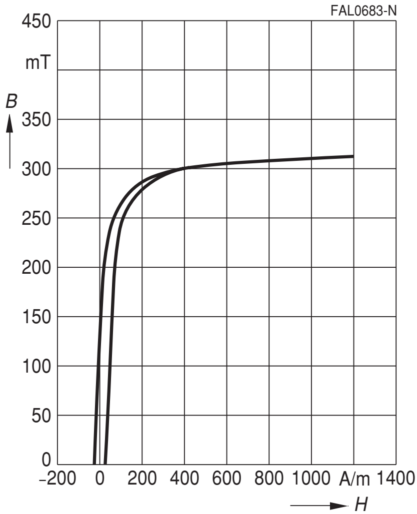
Relative loss factor $\tan\delta/\mu_i$
versus frequency
(measured on R29 toroids)



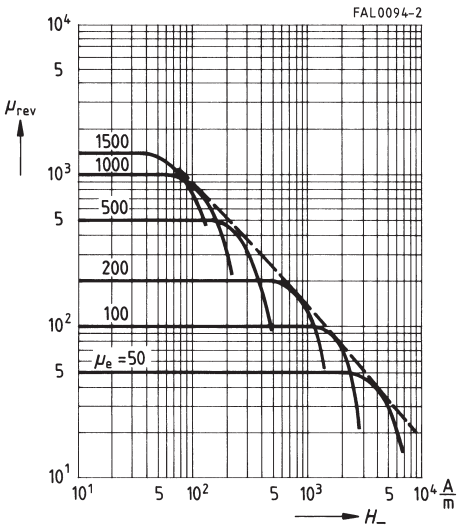
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



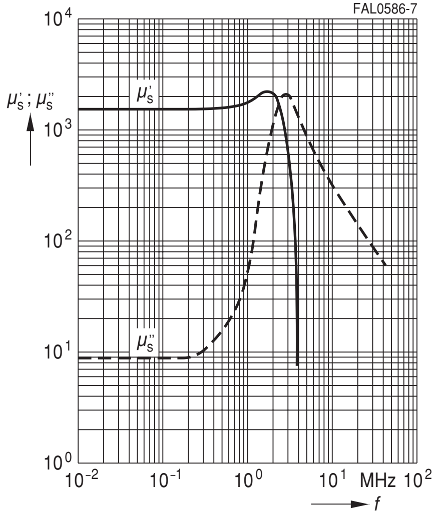
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



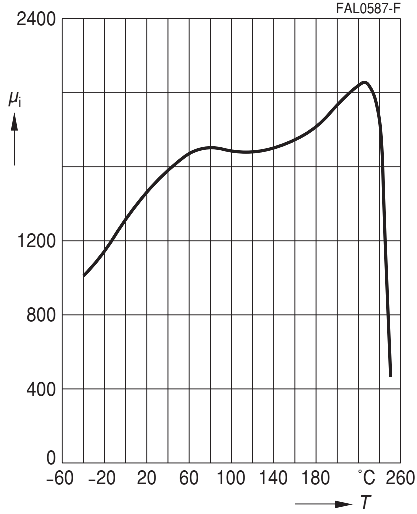
DC magnetic bias
(measured on ETD cores, typical values)
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



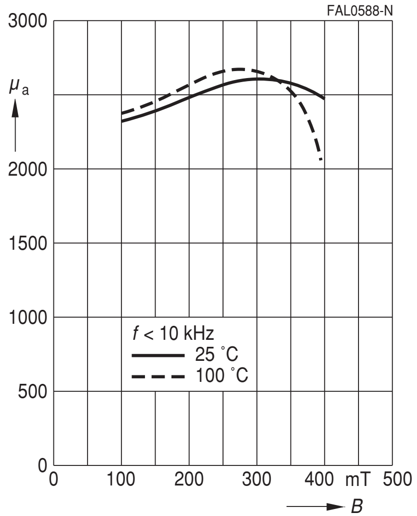
Complex permeability
versus frequency
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



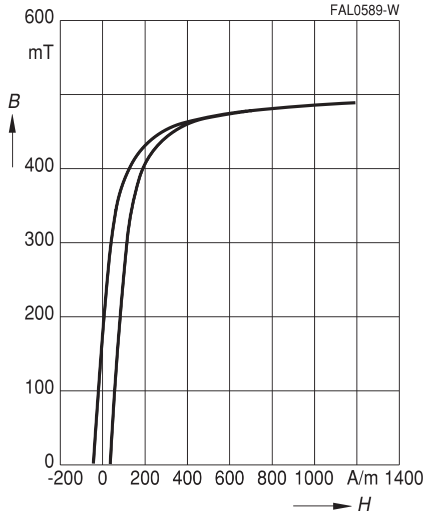
Initial permeability μ_i
versus temperature
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



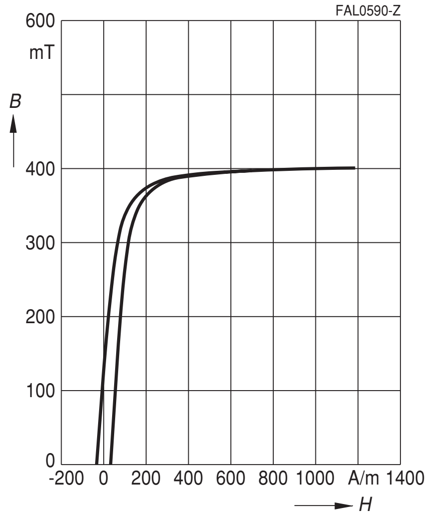
Amplitude permeability
versus AC field flux density
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



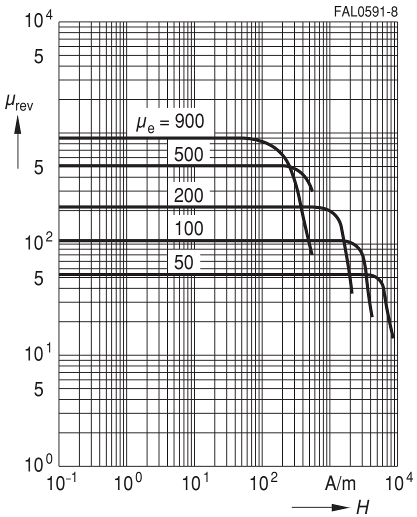
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



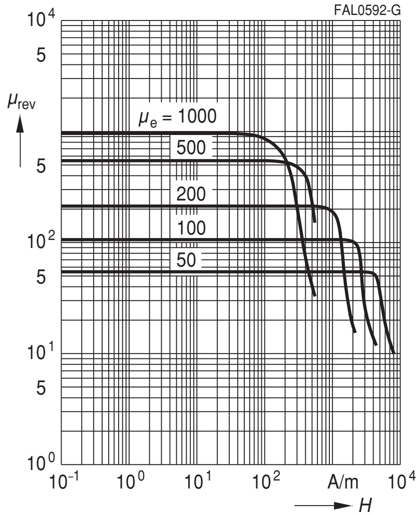
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



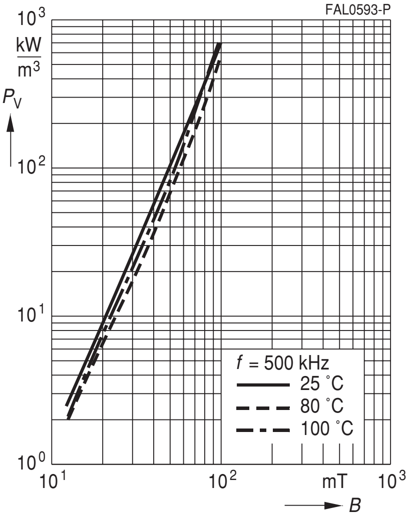
DC magnetic bias
measured on ETD cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



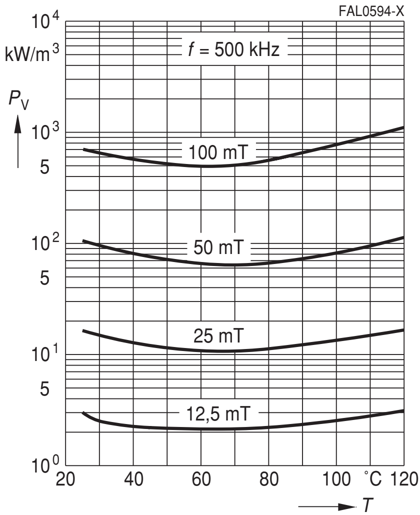
DC magnetic bias
measured on ETD cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 100 °C)



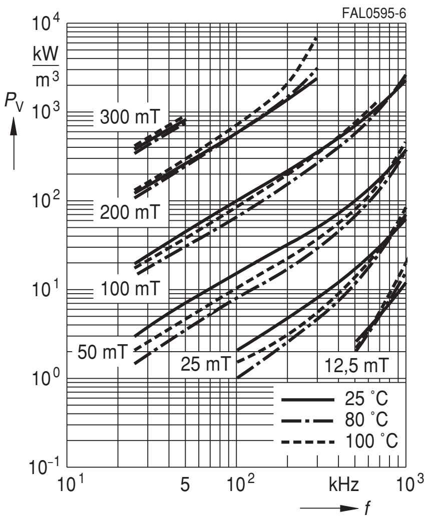
Relative core losses
versus AC field flux density
(measured on R34 toroids)



Relative core losses
versus temperature
(measured on R34 toroids)

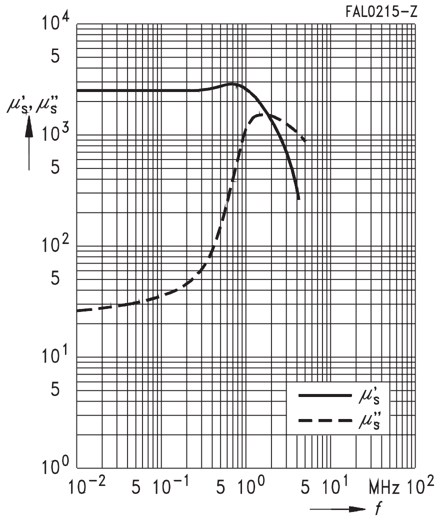


Relative core losses
versus frequency
(measured on R34 toroids)

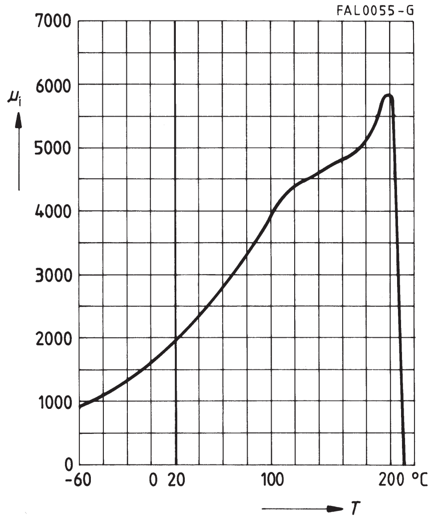


Not for new design

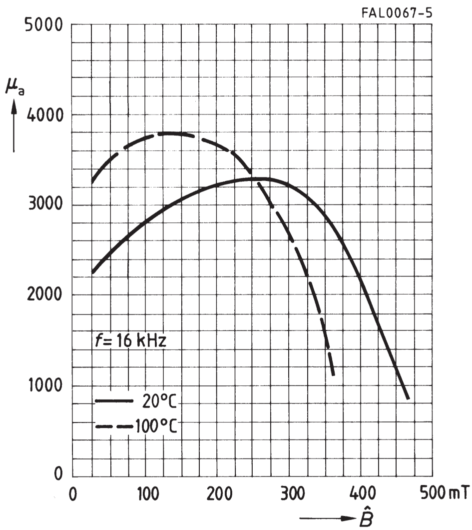
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



Initial permeability μ_i
versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)

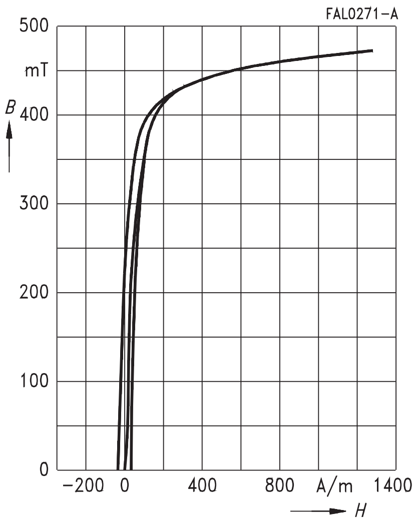


Amplitude permeability versus AC field
flux density
(measured on ungapped E cores)

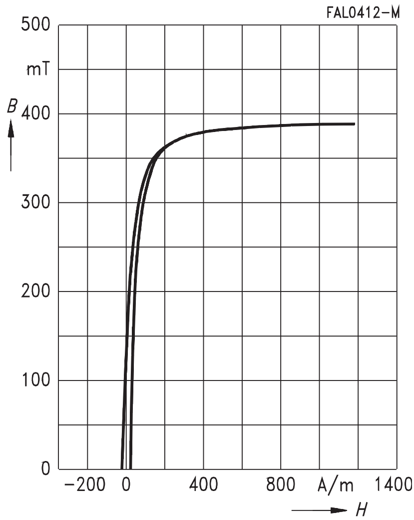


Not for new design

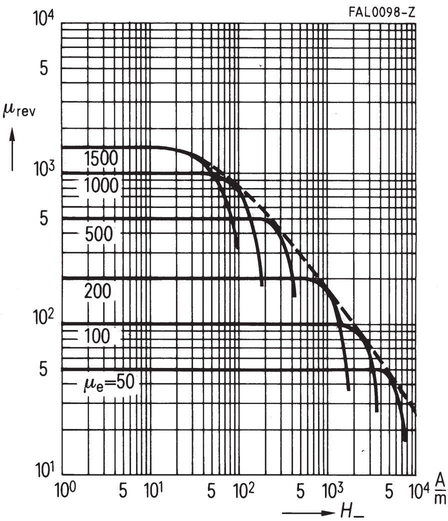
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



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

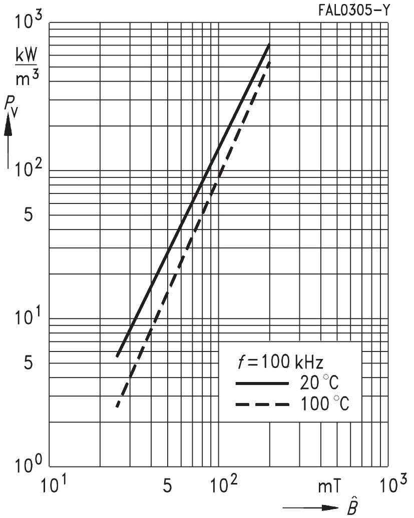


DC magnetic bias
of P, RM, PM and E cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)

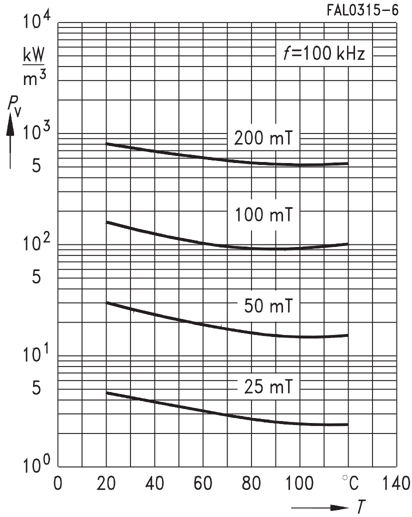


Not for new design

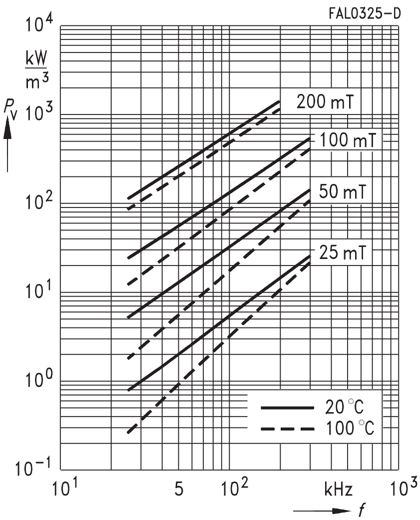
Relative core losses versus AC field flux density (measured on R16 toroids)



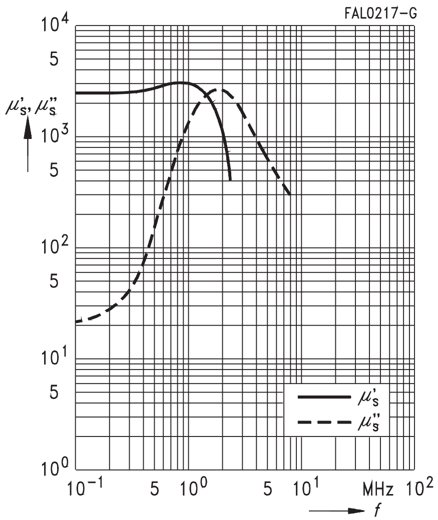
Relative core losses versus temperature (measured on R16 toroids)



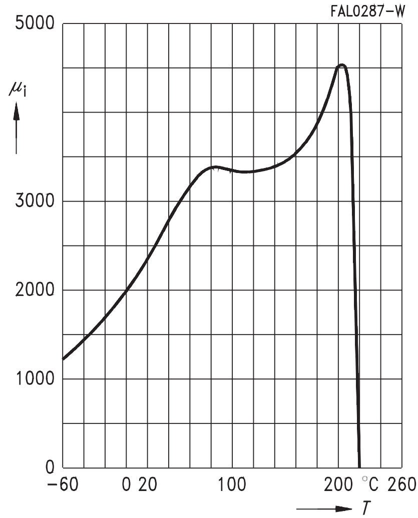
Relative core losses versus frequency (measured on R16 toroids)



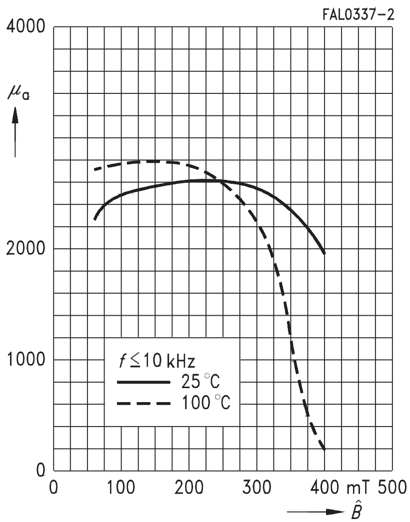
Complex permeability
versus frequency
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



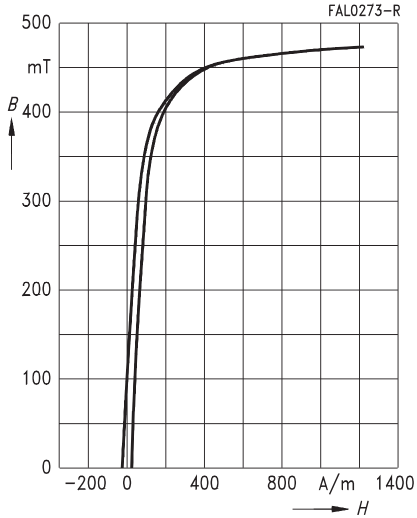
Initial permeability μ_i
versus temperature
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



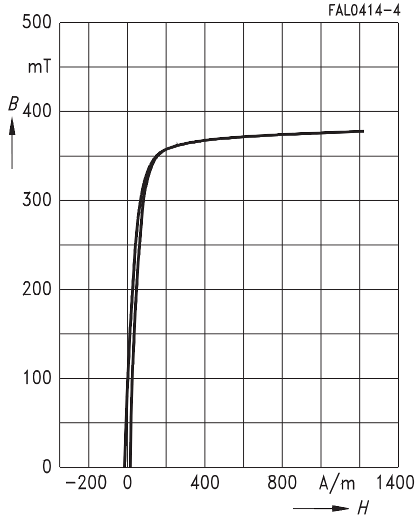
Amplitude permeability versus AC field
flux density
(measured on ungapped U cores)



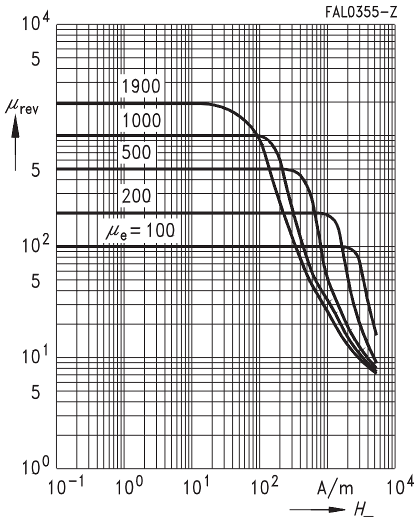
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



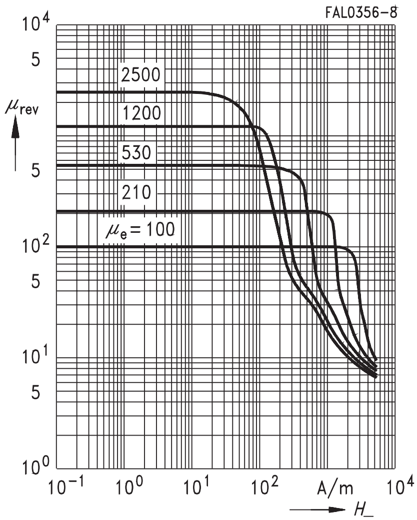
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



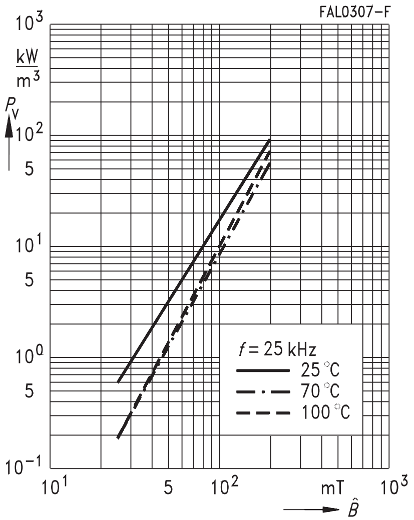
DC magnetic bias of E cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



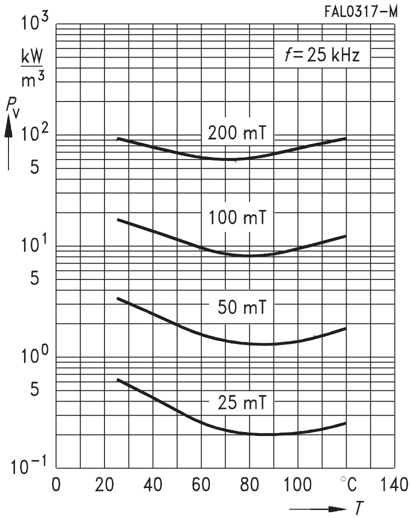
DC magnetic bias of E cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 100 °C)



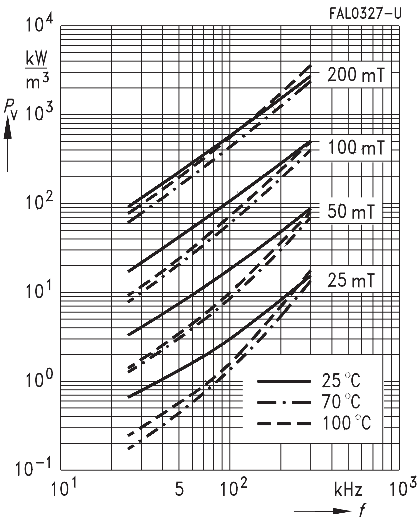
Relative core losses versus AC field flux density
(measured on R29 toroids)



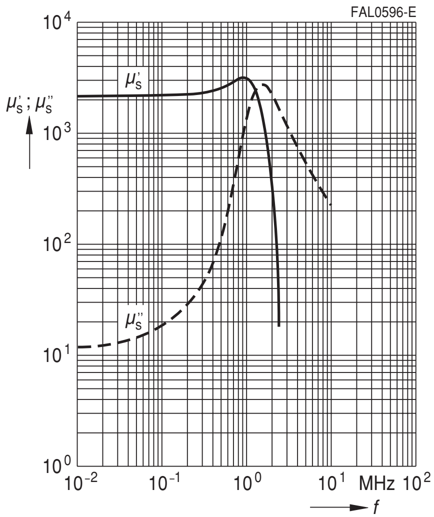
Relative core losses versus temperature
(measured on R29 toroids)



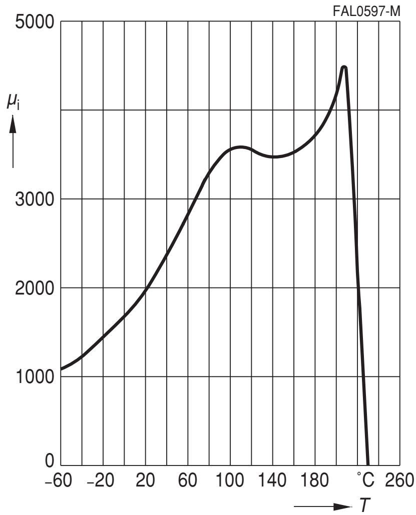
Relative core losses versus frequency
(measured on R29 toroids)



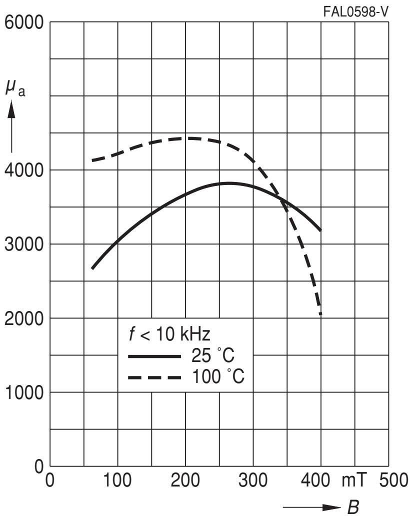
Complex permeability
versus frequency
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



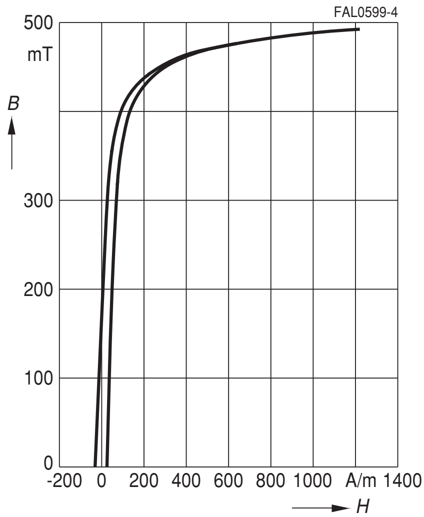
Initial permeability μ_i
versus temperature
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



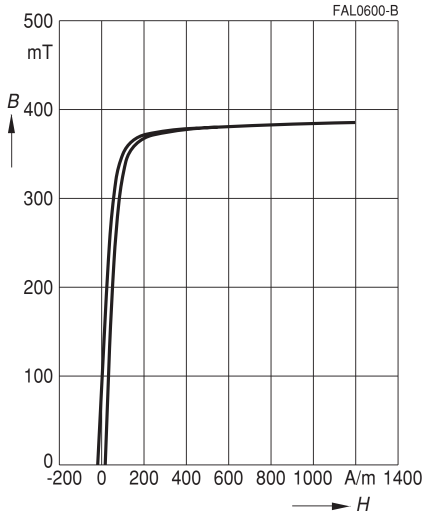
Amplitude permeability
versus AC field flux density
(measured on R34 toroids, $\hat{B} \leq$ 0,25 mT)



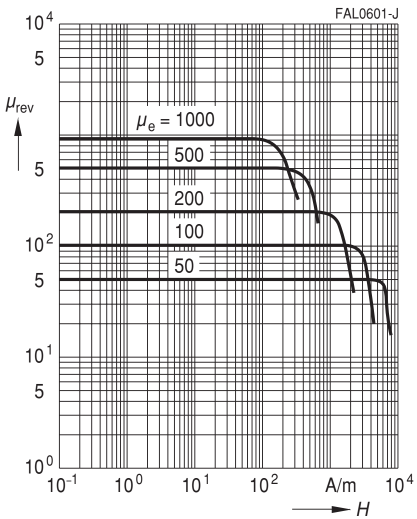
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



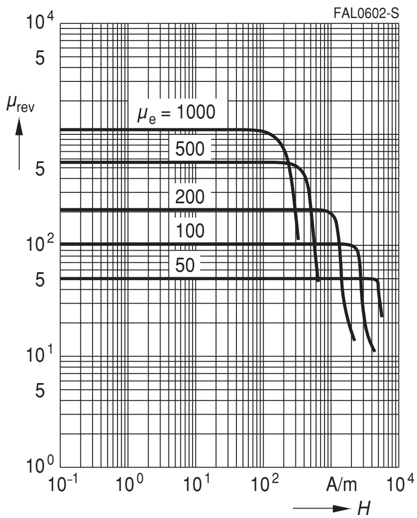
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



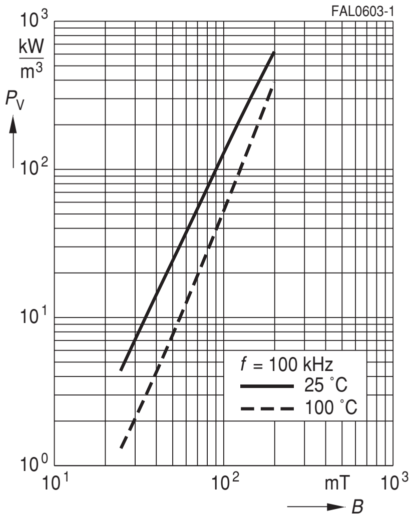
DC magnetic bias
of P, RM, PM and E cores
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



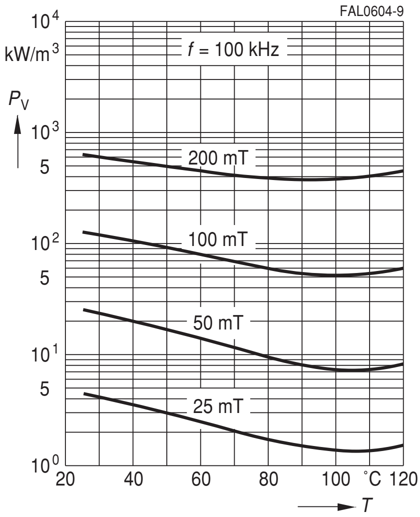
DC magnetic bias
of P, RM, PM and E cores
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 100 °C)



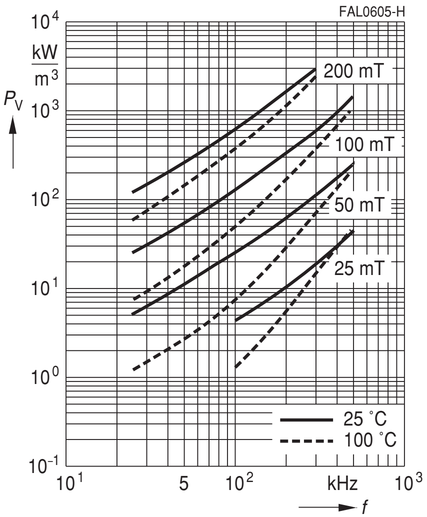
Relative core losses
versus AC field flux density
(measured on R34 toroids)



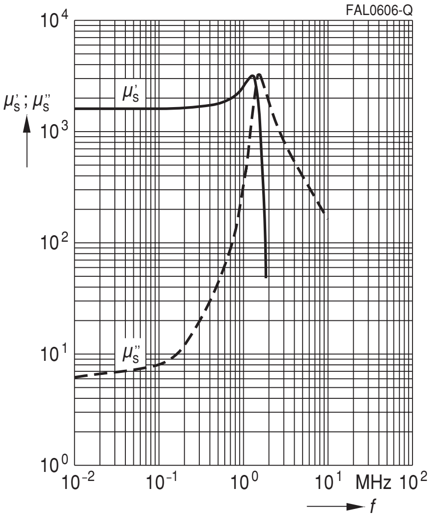
Relative core losses
versus temperature
(measured on R34 toroids)



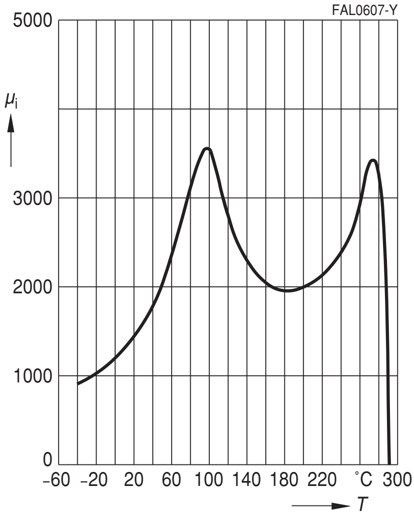
Relative core losses
versus frequency
(measured on R34 toroids)



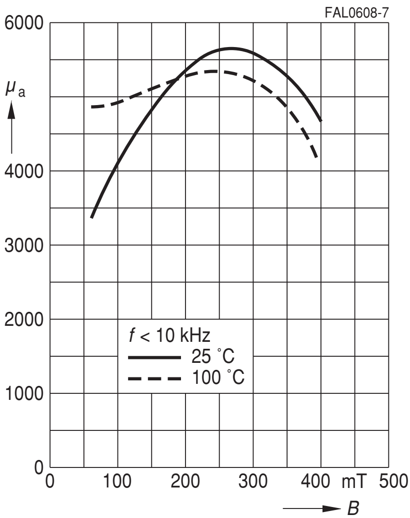
Complex permeability
versus frequency
(measured on R34 toroids, $\hat{B} \leq 0{,}25$ mT)



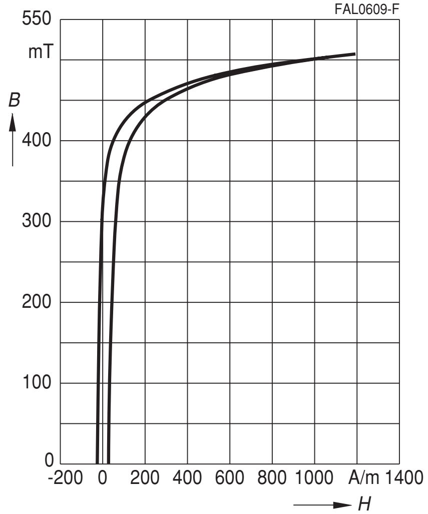
Initial permeability μ_i
versus temperature
(measured on R34 toroids, $\hat{B} \leq 0{,}25$ mT)



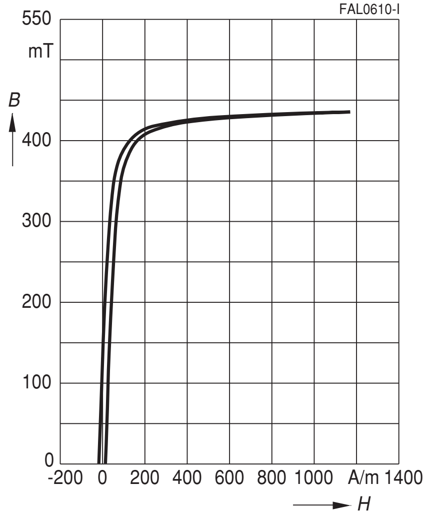
Amplitude permeability
versus AC field flux density
(measured on R34 toroids, $\hat{B} \leq 0{,}25$ mT)



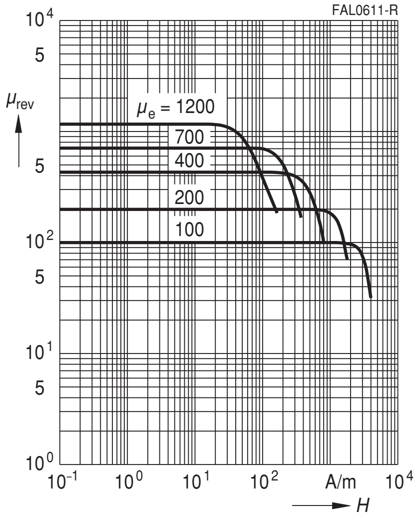
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



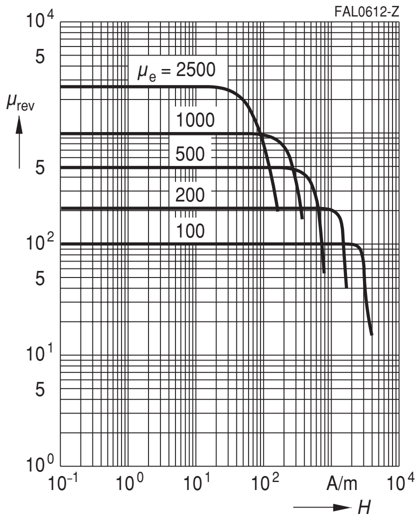
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



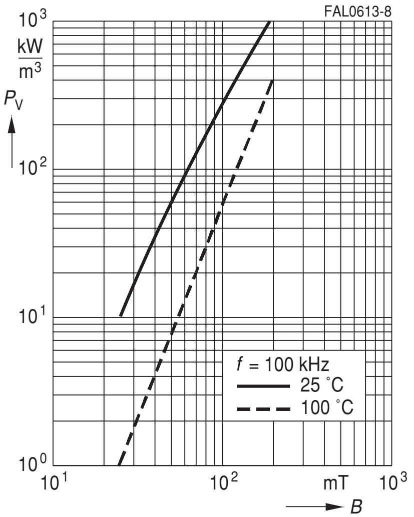
DC magnetic bias
measured on ETD cores
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



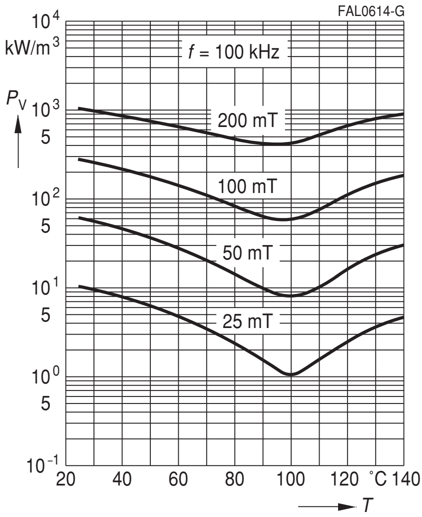
DC magnetic bias
measured on ETD cores
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 100 °C)



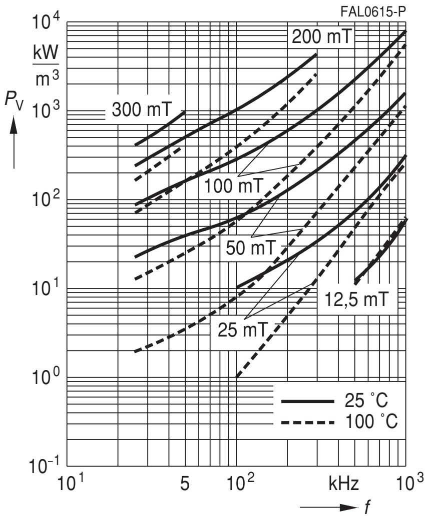
Relative core losses
versus AC field flux density
(measured on R34 toroids)



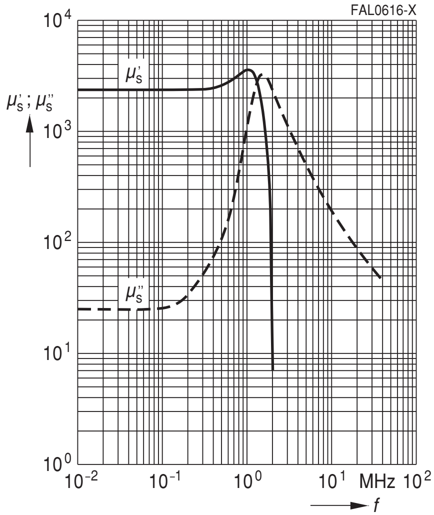
Relative core losses
versus temperature
(measured on R34 toroids)



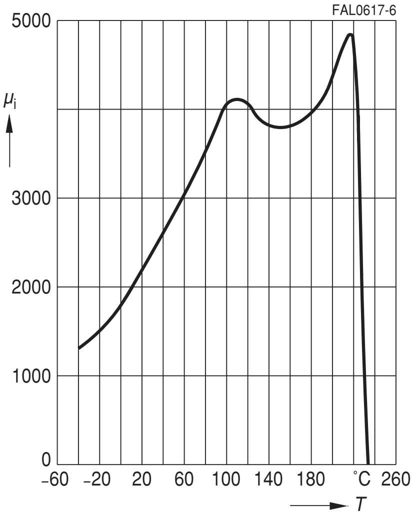
Relative core losses
versus frequency
(measured on R34 toroids)



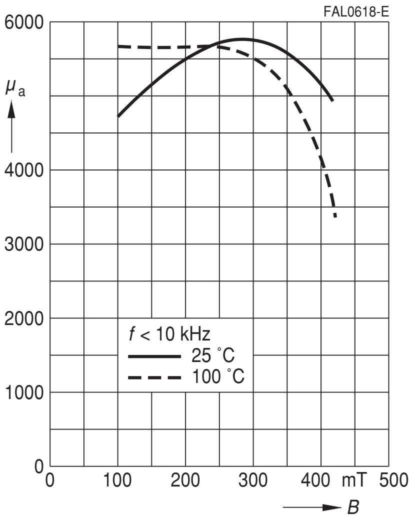
Complex permeability
versus frequency
(measured on R34 toroids, $\hat{B} \leq 0,25$ mT)



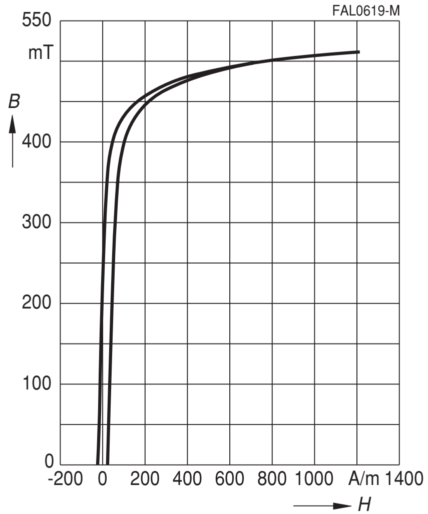
Initial permeability μ_i
versus temperature
(measured on R34 toroids, $\hat{B} \leq 0,25$ mT)



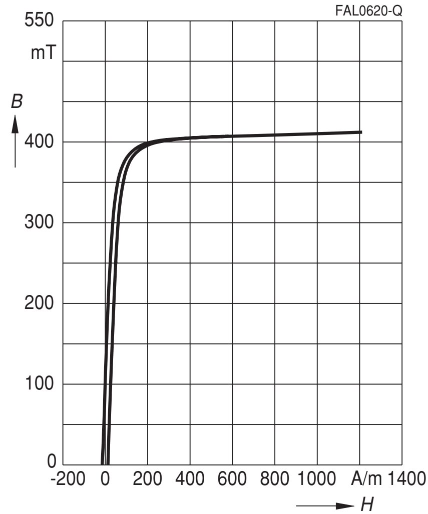
Amplitude permeability
versus AC field flux density
(measured on R34 toroids, $\hat{B} \leq 0,25$ mT)



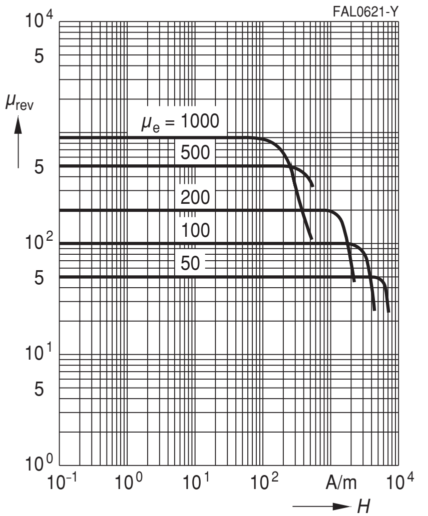
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



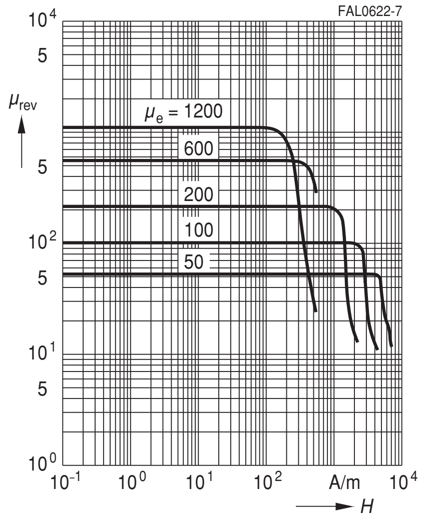
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



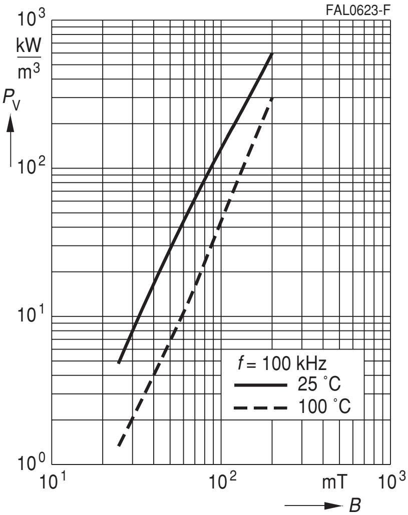
DC magnetic bias
measured on ETD cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



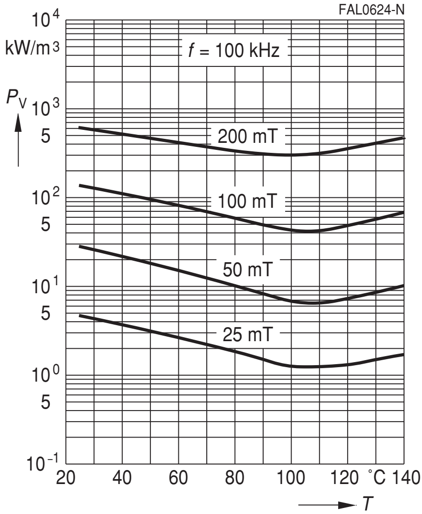
DC magnetic bias
measured on ETD cores
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 100 °C)



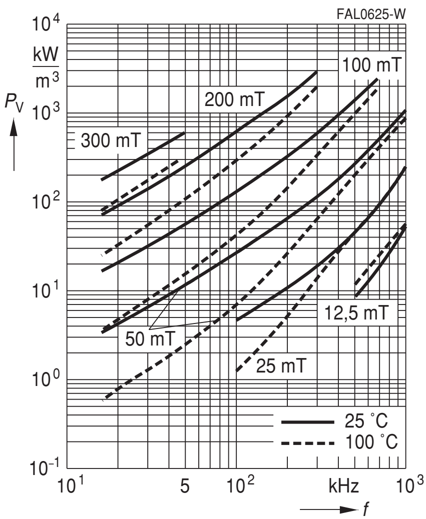
Relative core losses
versus AC field flux density
(measured on R34 toroids)



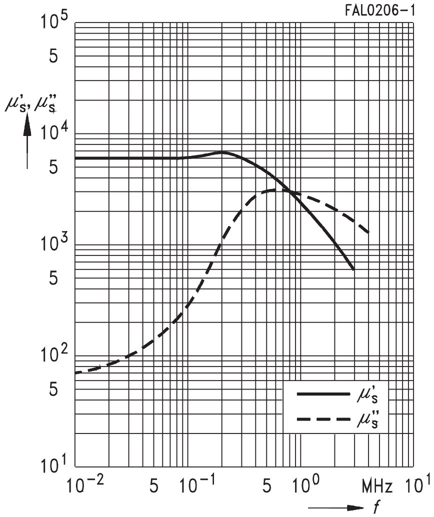
Relative core losses
versus temperature
(measured on R34 toroids)



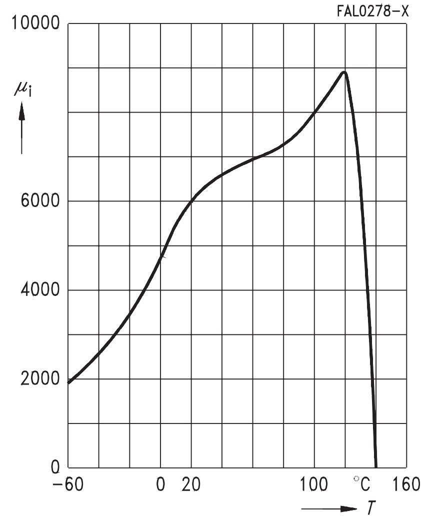
Relative core losses
versus frequency
(measured on R34 toroids)



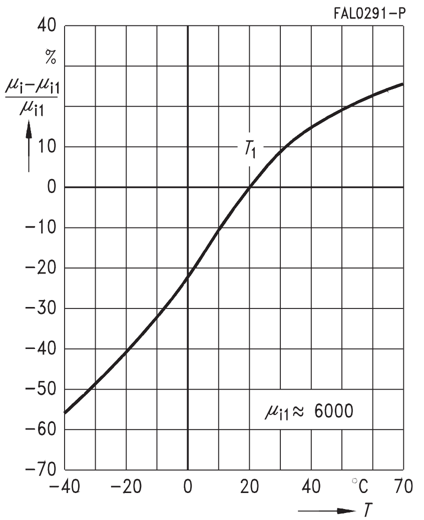
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0,25$ mT)



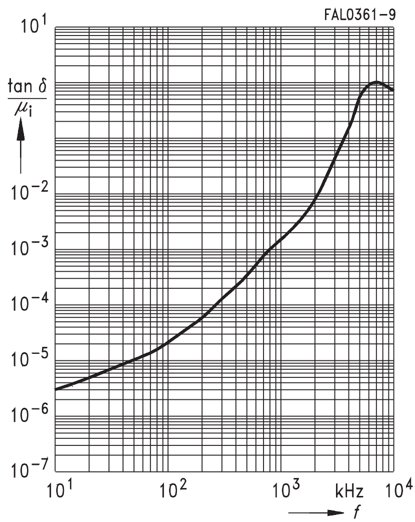
Initial permeability μ_i
versus temperature
(measured on R16 toroids, $\hat{B} \leq 0,25$ mT)



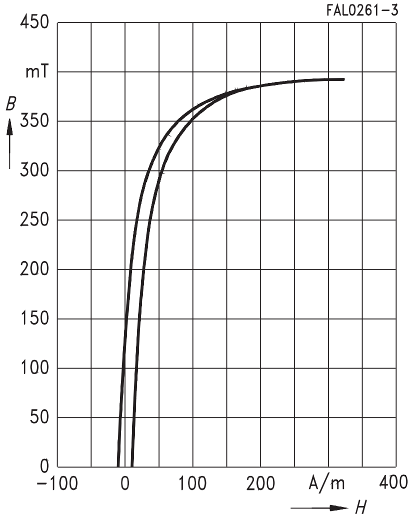
Variation of initial permeability
with temperature
(measured on R16 toroids, $\hat{B} \leq 0,25$ mT)



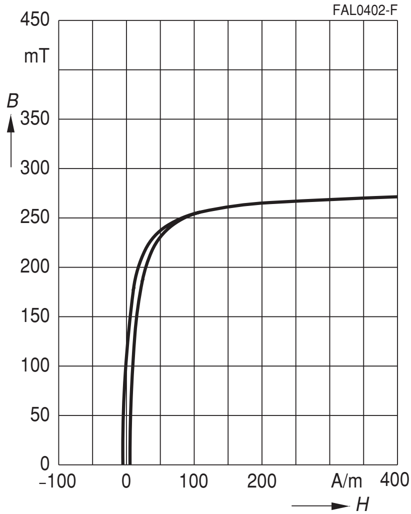
Relative loss factor
versus frequency
(measured on R16 toroids, $\hat{B} \leq 0,25$ mT)



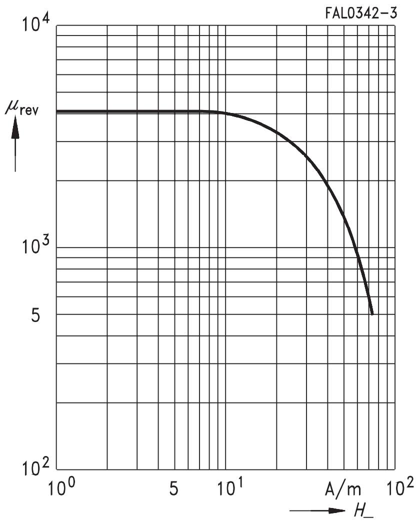
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



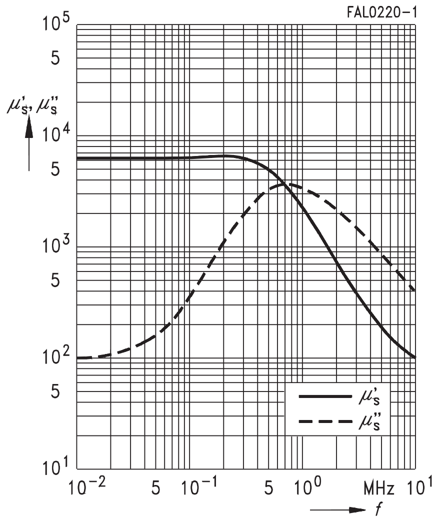
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



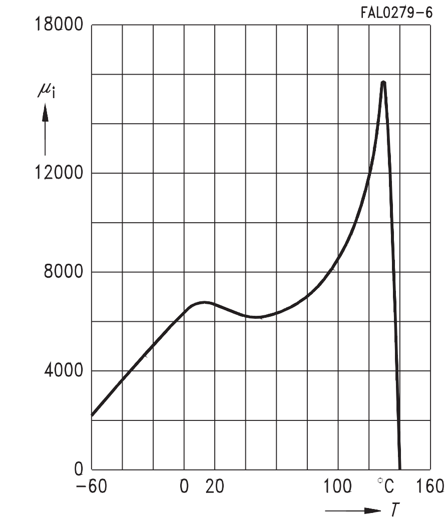
DC magnetic bias
(measured on RM cores, typical values)
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



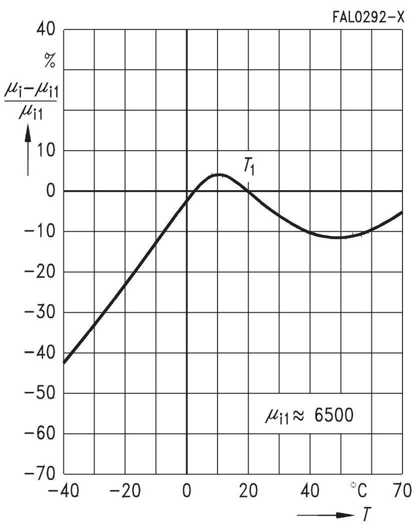
Complex permeability
versus frequency
(measured on R16 toroids, $\hat{B} \leq 0{,}25$ mT)



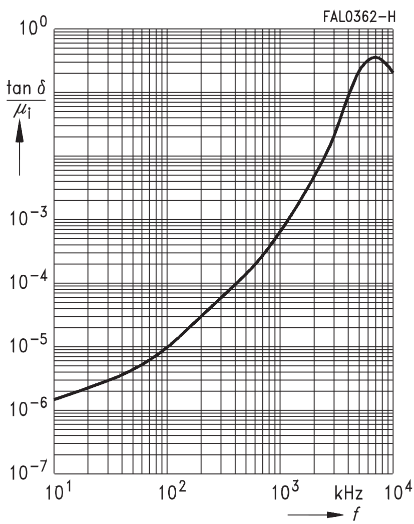
Initial permeability μ_i
versus temperature
(measured on R22 toroids, $\hat{B} \leq 0{,}25$ mT)



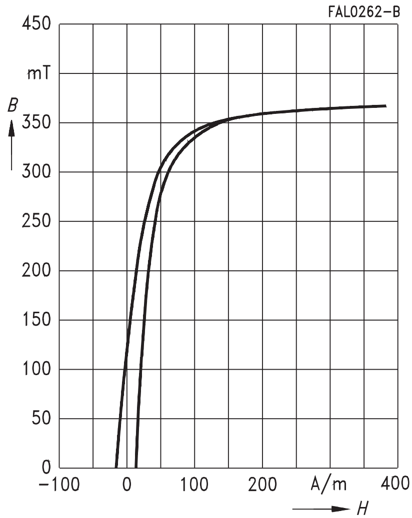
Variation of initial permeability
with temperature
(measured on R22 toroids, $\hat{B} \leq 0{,}25$ mT)



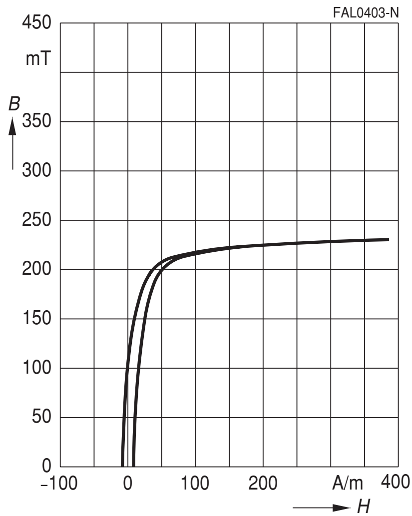
Relative loss factor
versus frequency
(measured on R16 toroids, $\hat{B} \leq 0{,}25$ mT)



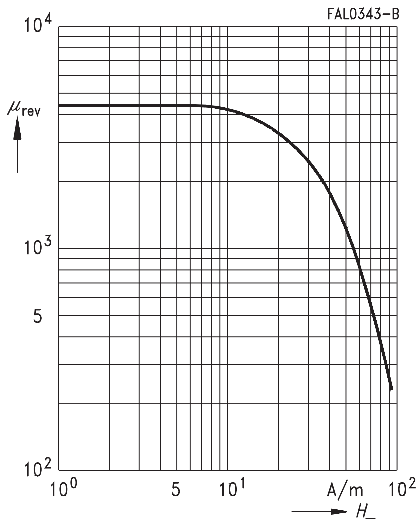
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



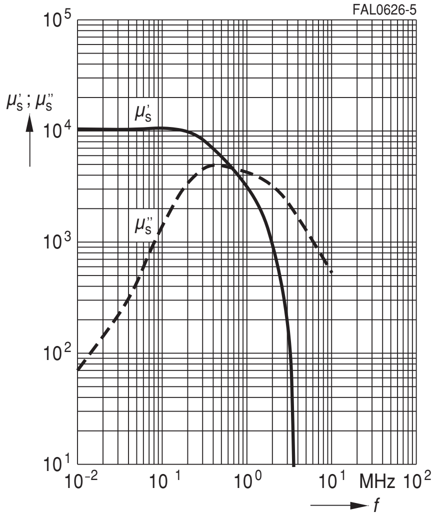
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



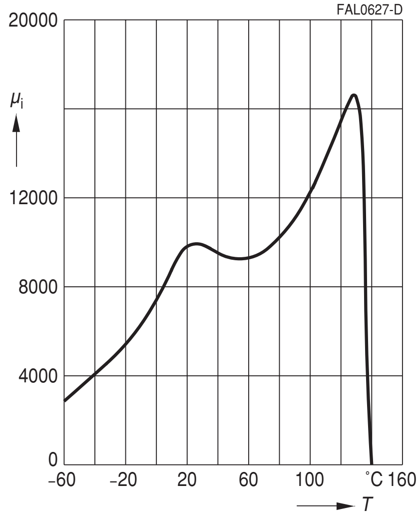
DC magnetic bias
(measured on RM cores, typical values)
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)



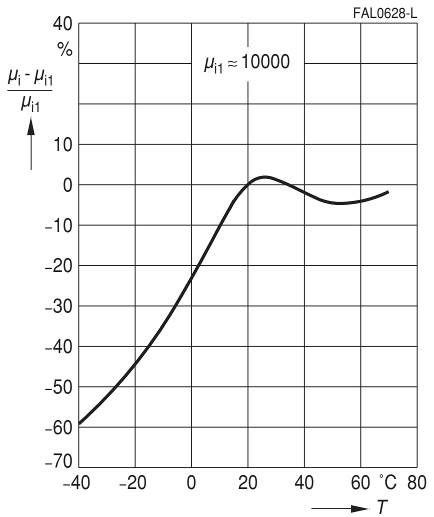
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



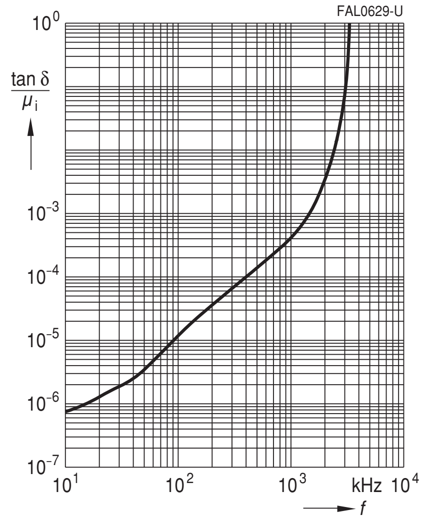
Initial permeability μ_i
versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



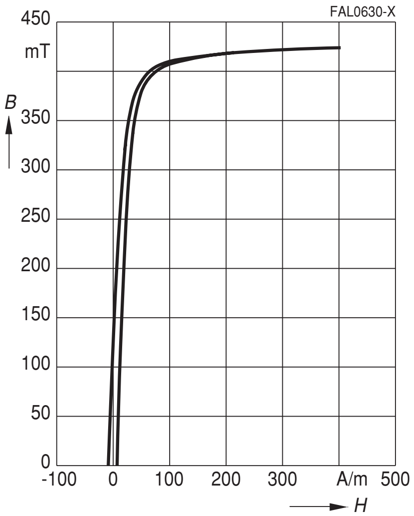
Variation of initial permeability
with temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



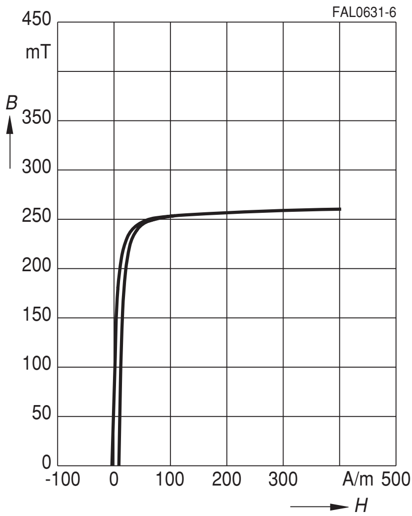
Relative loss factor
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



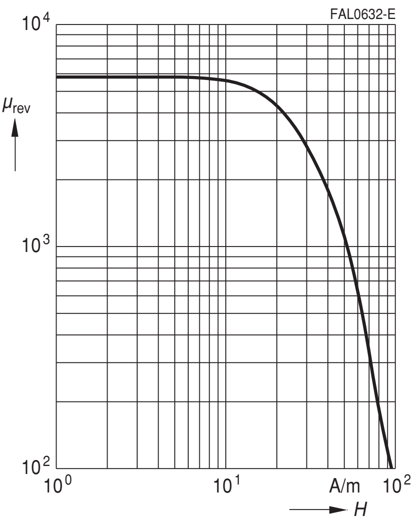
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



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



DC magnetic bias
(measured on RM cores, typical values)
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



SIFERRIT Materials

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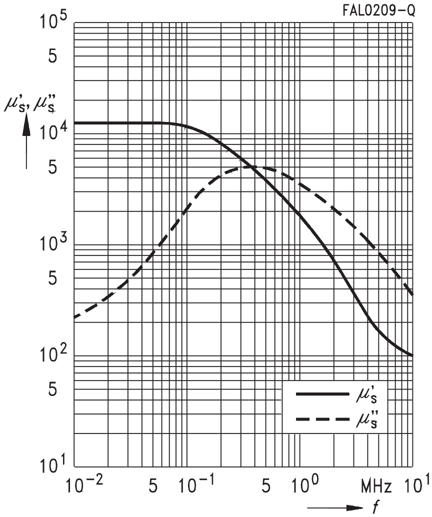
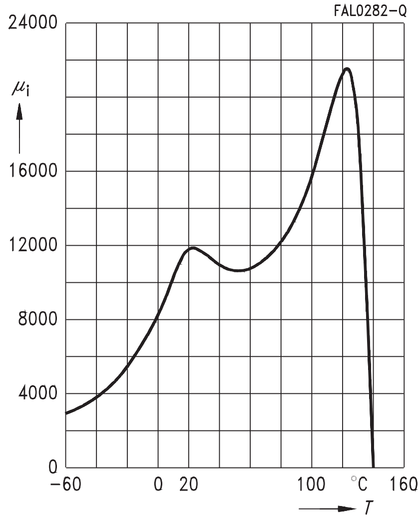
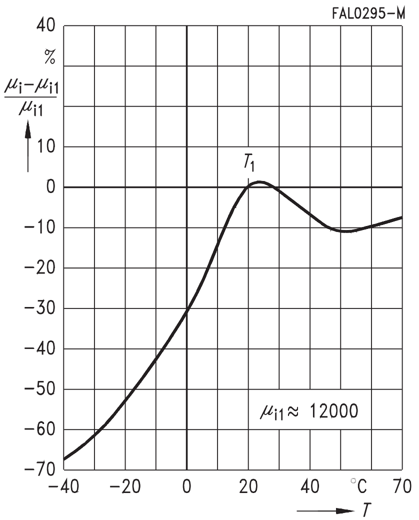
Complex permeability
versus frequency
(measured on R9,5 toroids, $\hat{B} \leq 0{,}25$ mT)



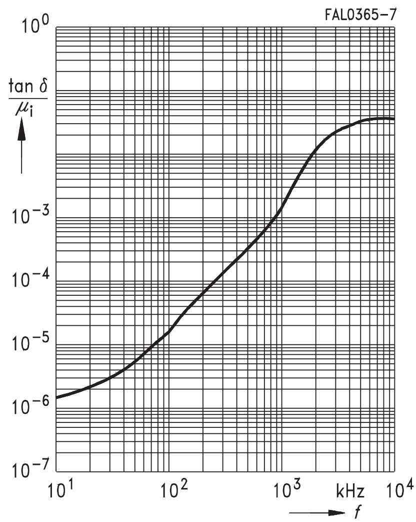
Initial permeability μ_i
versus temperature
(measured on R9,5 toroids, $\hat{B} \leq 0{,}25$ mT)



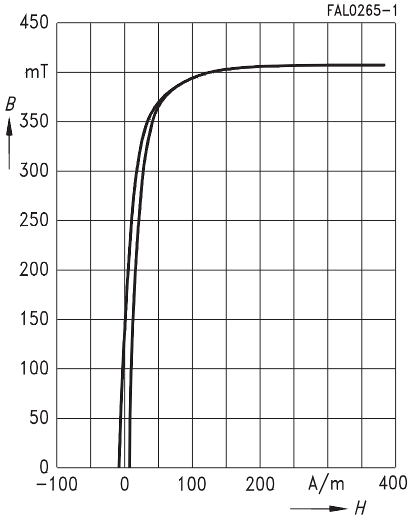
Variation of initial permeability
with temperature
(measured on R9,5 toroids, $\hat{B} \leq 0{,}25$ mT)



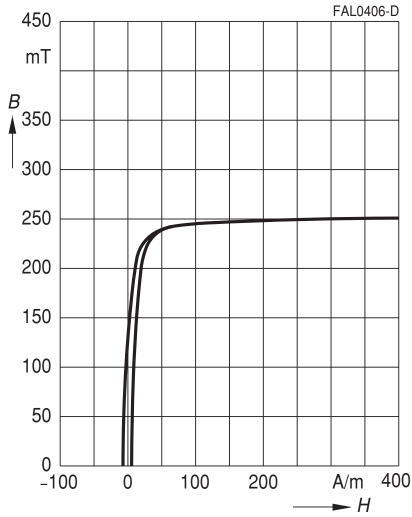
Relative loss factor
versus frequency
(measured on R9,5 toroids, $\hat{B} \leq 0{,}25$ mT)



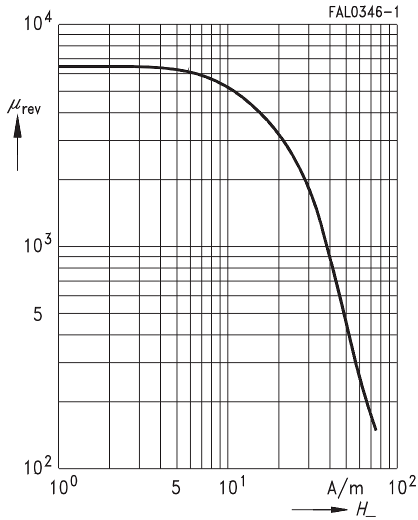
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



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

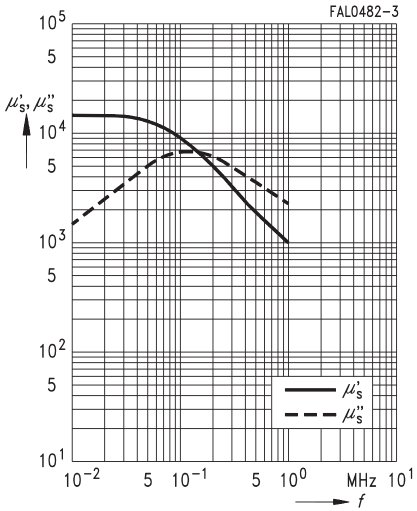


DC magnetic bias
(measured on RM cores, typical values)
($\hat{B} \leq$ 0,25 mT, f = 10 kHz, T = 25 °C)

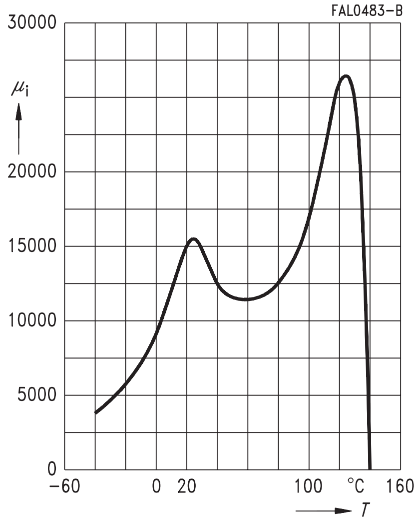


T 46

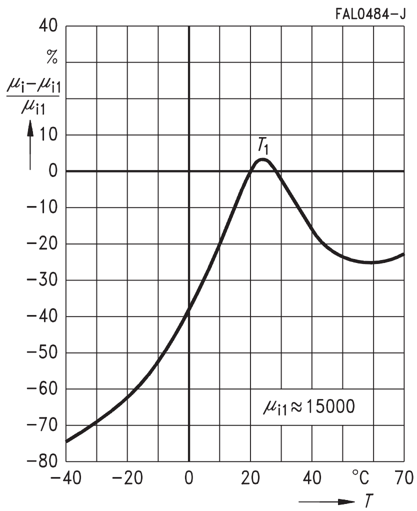
Complex permeability
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



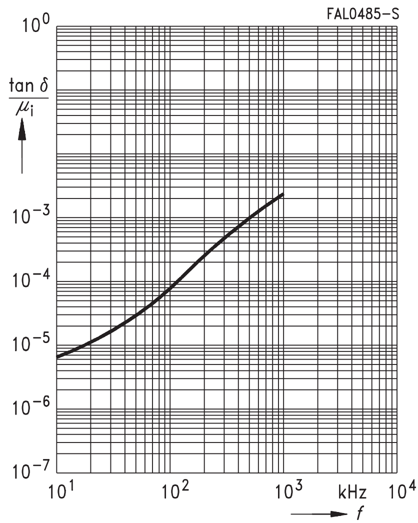
Initial permeability μ_i
versus temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



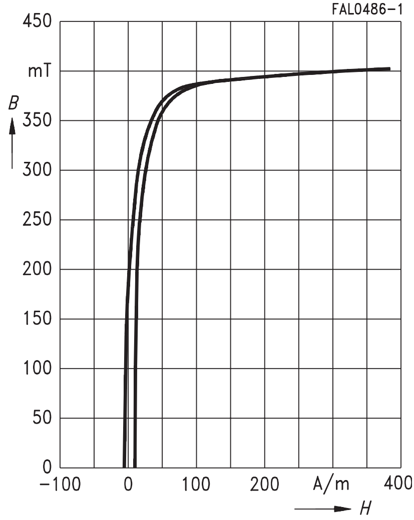
Variation of initial permeability
with temperature
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



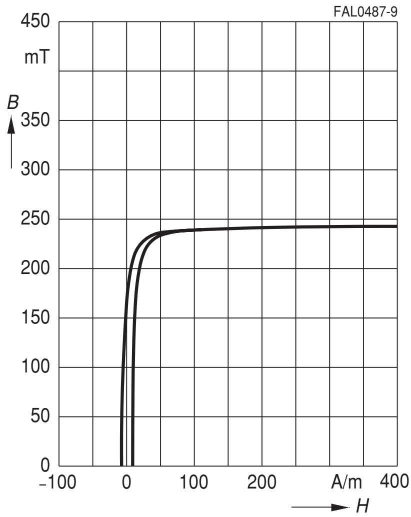
Relative loss factor
versus frequency
(measured on R10 toroids, $\hat{B} \leq 0{,}25$ mT)



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

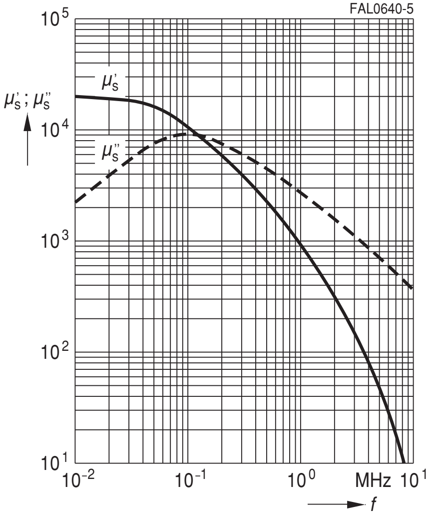


Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)

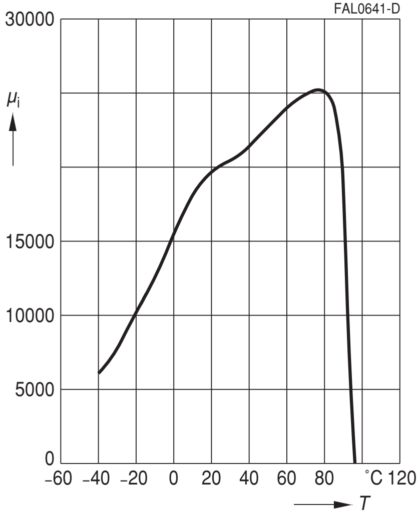


T 56

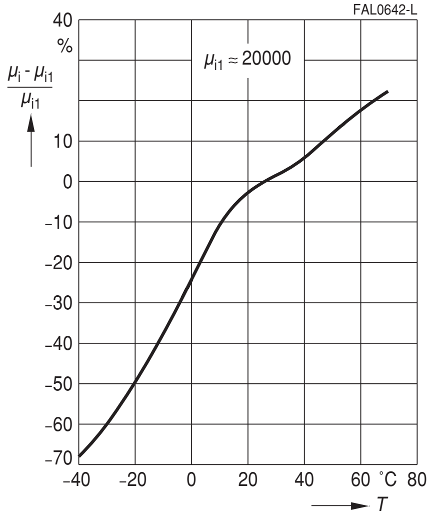
Complex permeability
versus frequency
(measured on R12,5 toroids, $\hat{B} \leq 0{,}25$ mT)



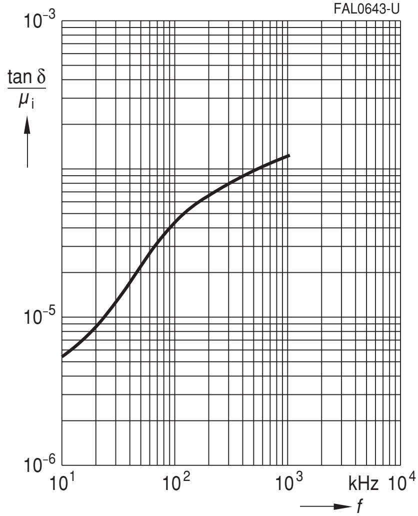
Initial permeability μ_i
versus temperature
(measured on R12,5 toroids, $\hat{B} \leq 0{,}25$ mT)



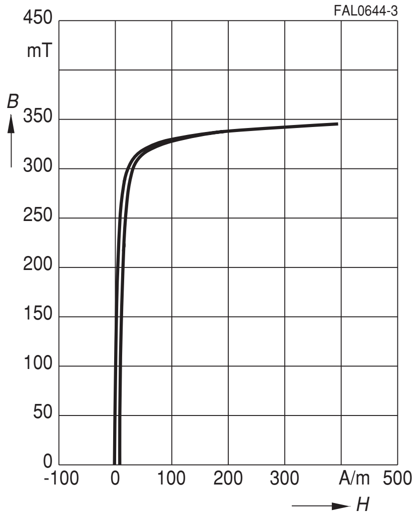
Variation of initial permeability
with temperature
(measured on R12,5 toroids, $\hat{B} \leq 0{,}25$ mT)



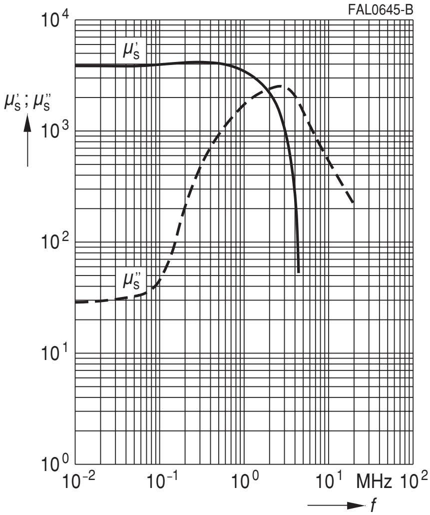
Relative loss factor
versus frequency
(measured on R12,5 toroids, $\hat{B} \leq 0{,}25$ mT)



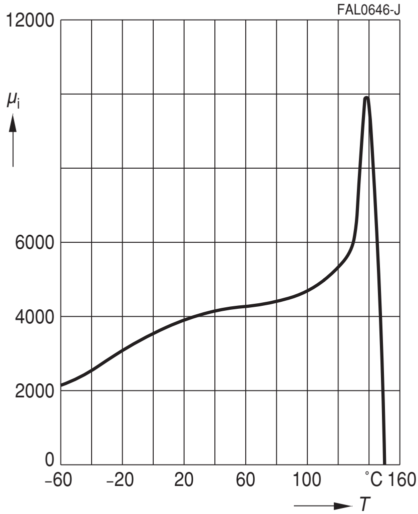
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



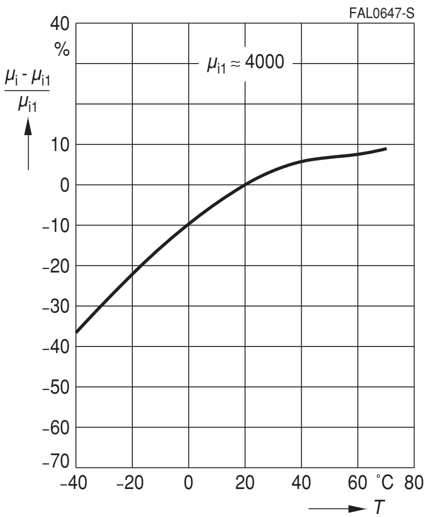
Complex permeability
versus frequency
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



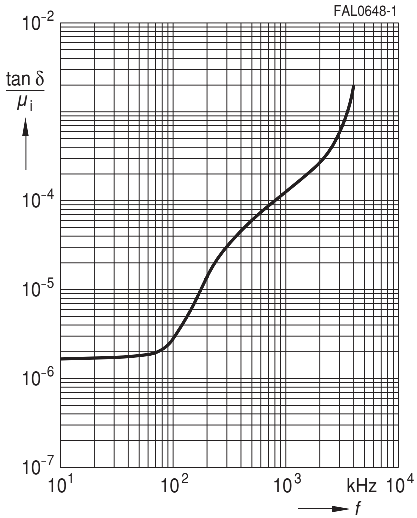
Initial permeability μ_i
versus temperature
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



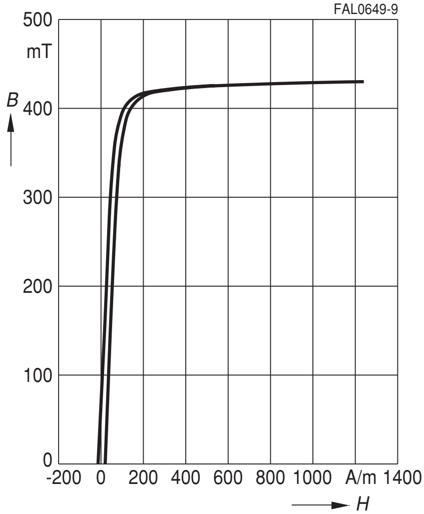
Variation of initial permeability
with temperature
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



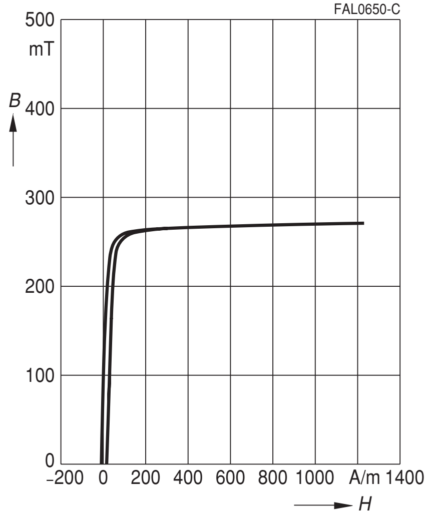
Relative loss factor
versus frequency
(measured on R17 toroids, $\hat{B} \leq 0{,}25$ mT)



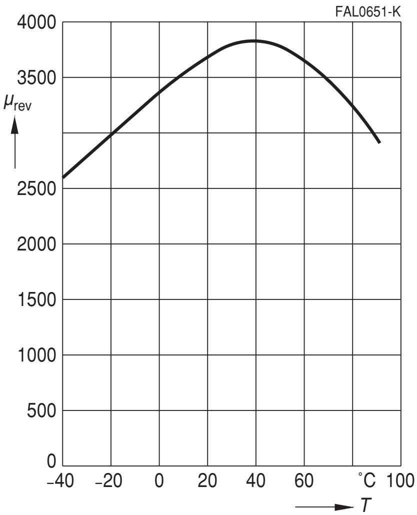
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



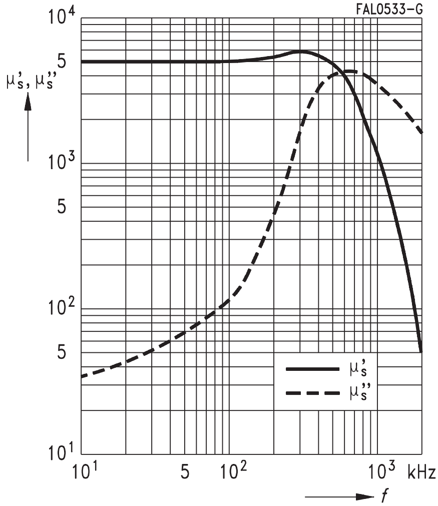
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 100 °C)



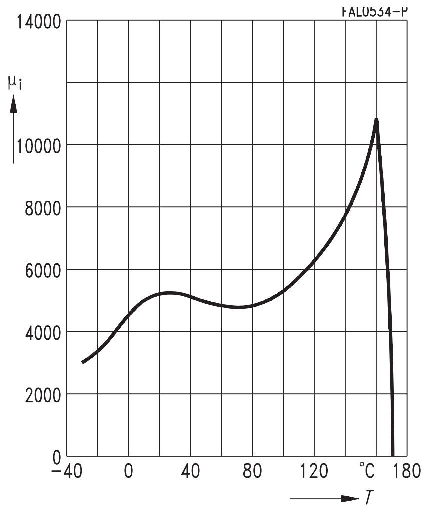
Reversible permeability versus temperature
(measured on toroids at f = 100 kHz,
HDC = 27,5 A/m, $\hat{B}$ = 6 mT)



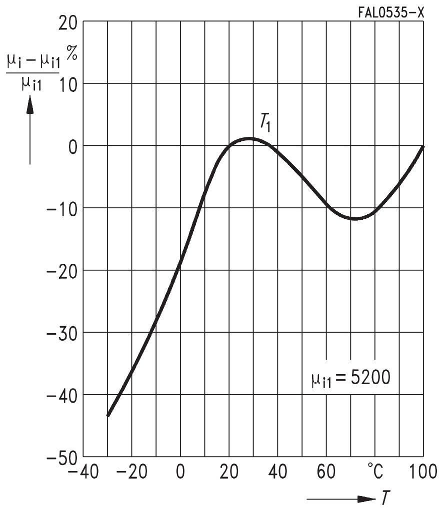
Complex permeability
versus frequency
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



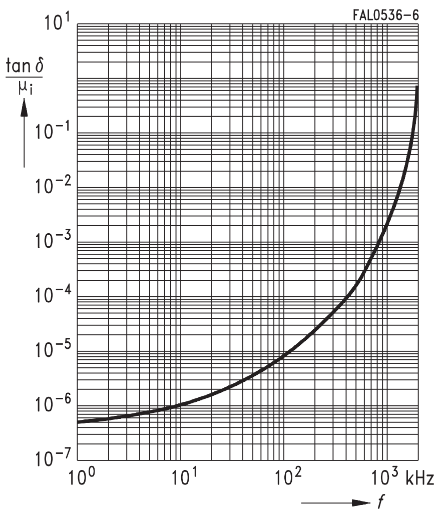
Initial permeability μ_i
versus temperature
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



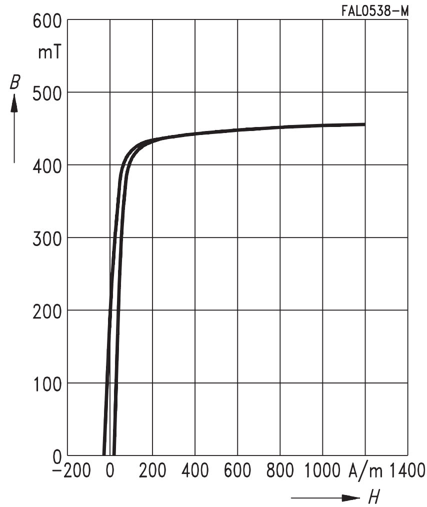
Variation of initial permeability
with temperature
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



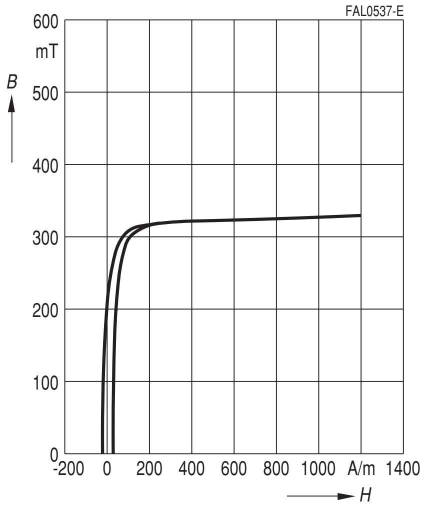
Relative loss factor
versus frequency
(measured on R29 toroids, $\hat{B} \leq$ 0,25 mT)



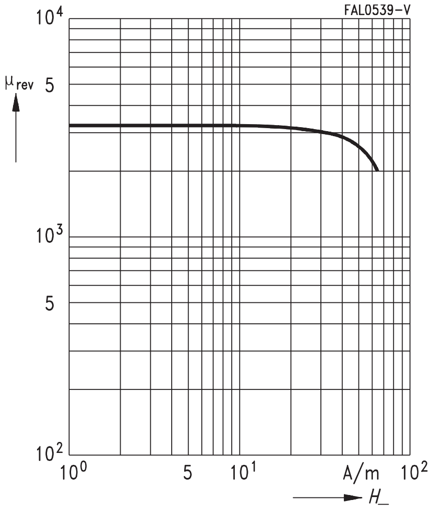
Dynamic magnetization curves
(typical values)
(f = 10 kHz, T = 25 °C)



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



DC magnetic bias
(measured on RM cores, typical values)
($\hat{B}$ ≤ 0,25 mT, f = 10 kHz, T = 25 °C)



5 Plastic materials, manufacturers and UL numbers

- RM coil formers of thermosetting plastic, color code blue (molded-in pins):
  Bakelite UP 3420® [E 61040 (M)]; Bakelite
- RM, EP and EFD coil formers of thermosetting plastic, color code black (post-inserted pins):
  Sumikon PM 9630® [E41429 (M)]; Sumitomo Bakelite
- RM, EP and EFD coil formers of thermosetting plastic, color code green (post-inserted pins):
  Vyncolit/X611® [E167521 (M)]; Vyncolit NV
- EP7 special coil former of thermosetting plastic:
  AMC 2568® [E 48036 (M)], blue; Synres-Almoco BV
- RM power, P, PM, E, ETD, ER coil formers
  and terminal carriers P7×4, P9×5, P11×7, P36×22 (Polyterephthalate):
  Valox 420-SE0® [E 45329 (M)], black; General Electric Plastics
  Vestodur GF30-FR1® [E66645 (M)], black; Degussa Hüls
  Crastin CE 7931® [E 69578 (M)], black; DuPont
  Pocan 4235® [E 41613 (M)], black; Bayer
  Arnite TV4264SN® [E 47960 (M)], black; DSM
  Rynite FR 530® [E 69578 (M)], black; DuPont
- Terminal carrier P4,6×4,1 (Polyether Ketone):
  Luvocom 1105/GF/20/EM® [---], natural; Lehmann u. Voss & Co.
- Terminal carriers P14×8, P18×11, P22×13, P26×16, P30×19 (Polyterephthalate):
  Pocan 4235® [E 41613 (M)], grey; Bayer
- SMD coil formers (Liquid cristal polymer):
  Sumika Super E4008® [E 54705 (M)], black; Sumitomo Chemical
  Zenite 7130® [E 123598 (M)], black; DuPont
  Vectra C 130 [E 83005 (M)], black; Ticona
- Insulating washers:
  Makrofol KL 3 – 1005/1 [E 41613 (M)], natural; Bayer
  Pokalon SN [E 167358 (M)], natural; LOFO HIGH TECH FILM

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Further information to the UL certifications are available in the internet under http//:www.UL.com
Here you get the newest update of the yellow card.

EPCOS is an assigned molder with the UL file no. E 178263 (M).
The assigned designation is A 1770.

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