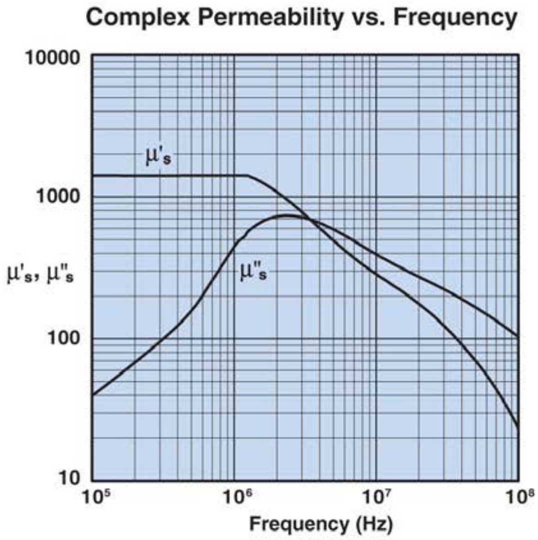
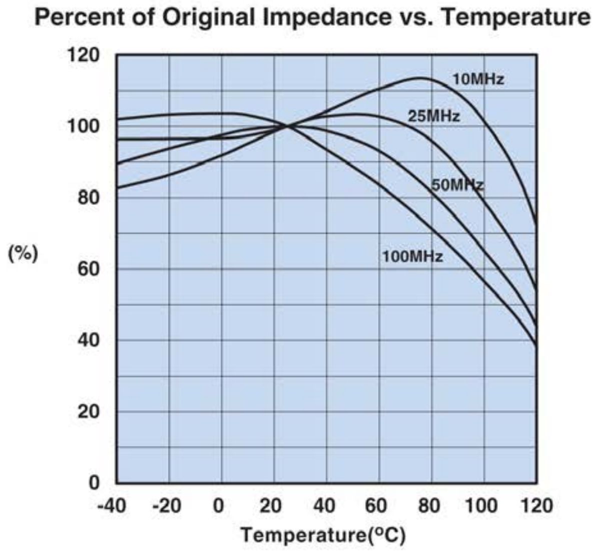
1. 31 Material Characteristics

A MnZn ferrite designed specifically for EMI suppression applications from as low as 1 MHz up to 500 MHz. This material does not have the dimensional resonance limitations associated with conventional MnZn ferrite materials. EMI suppression beads, round cable EMI suppression cores, round cable snap-its, flat cable EMI suppression cores, and flat cable snap-its are all available in 31 material.

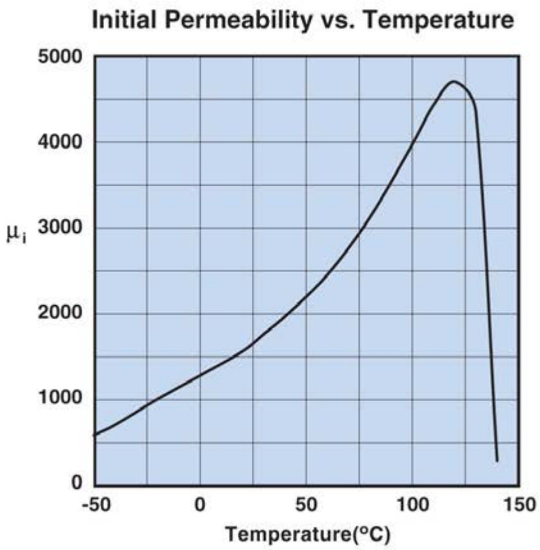
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	1500
Flux Density @ Field Strength	gauss oersted	B H	3400 5
Residual Flux Density	gauss	B_r	2500
Coercive Force	oersted	H_c	0.35
Loss Factor @ Frequency	10^{-6} MHz	$Tan\delta/\mu_i$	20 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		1.6
Curie Temperature	°C	T_c	>130
Resistivity	Ω cm	ρ	$1x10^3$
Frequency range	MHz		1 - 500



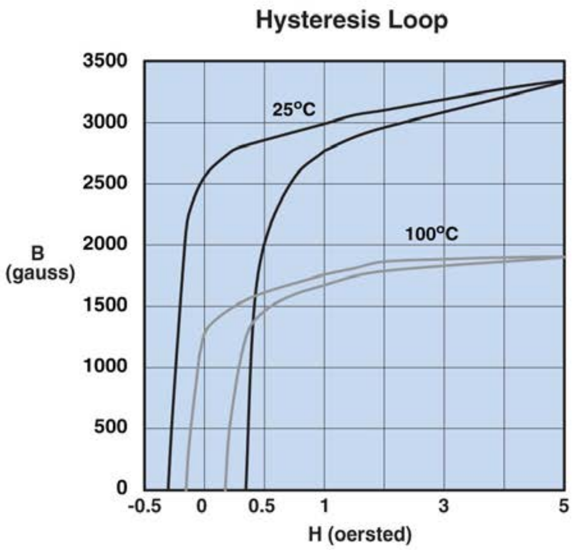
Measured on a 17/10/6mm toroid at 25°C using the HP 4284A and the HP 4291A.



Measured on a 2631000301 using the HP4291A.



Measured on a 17/10/6mm toroid at 100kHz.



Measured on a 17/10/6mm toroid at 10kHz.

R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy

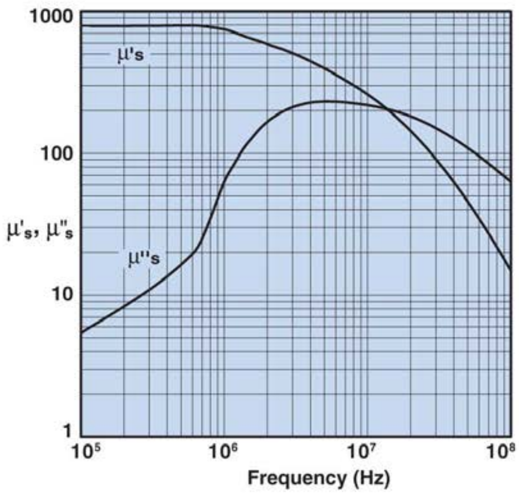
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

2. 43 Material Characteristics

This NiZn is our most popular ferrite for suppression of conducted EMI from 20 MHz to 250 MHz. This material is also used for inductive applications such as high frequency common-mode chokes.
EMI suppression beads, beads on leads, SM beads, multi-aperture cores, round cable EMI suppression cores, split round EMI suppression cores, round cable snap-its, flat cable EMI suppression cores, flat cable snap-its, miscellaneous suppression cores, bobbins, and toroids are all available in 43 material.

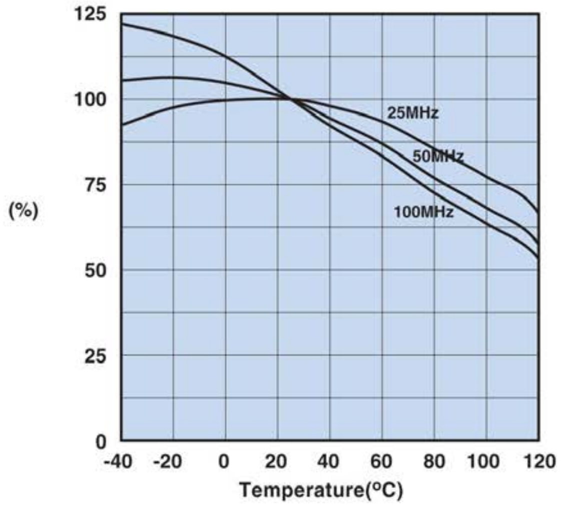
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	800
Flux Density @ Field Strength	gauss oersted	B H	2900 10
Residual Flux Density	gauss	B_r	1300
Coercive Force	oersted	H_c	0.45
Loss Factor @ Frequency	10^{-6} MHz	$\tan\delta/\mu_i$	250 1.0
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		1.25
Curie Temperature	°C	T_c	>130
Resistivity	Ω cm	ρ	$1x10^5$
Frequency range	MHz		20 - 300

Complex Permeability vs. Frequency



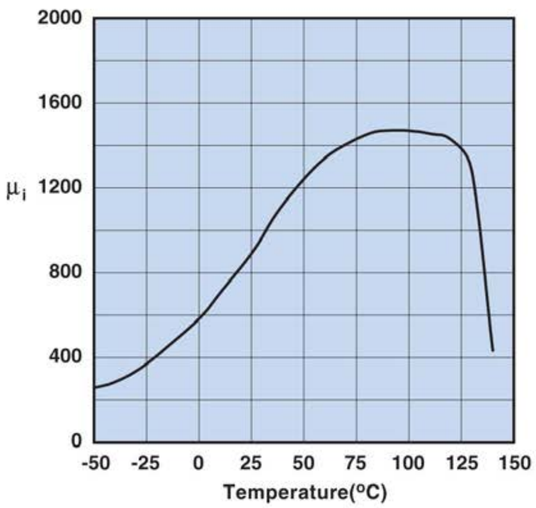
Measured on a 17/10/6mm toroid
using the HP 4284A and the HP 4291A.

Percent of Original Impedance vs. Temperature



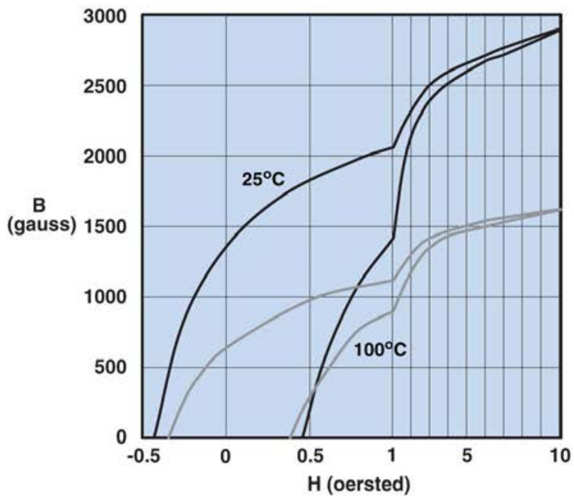
Measured on a 2643000301 using the HP4291A.

Initial Permeability vs. Temperature



Measured on a 17/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on a 17/10/6mm toroid at 10kHz.

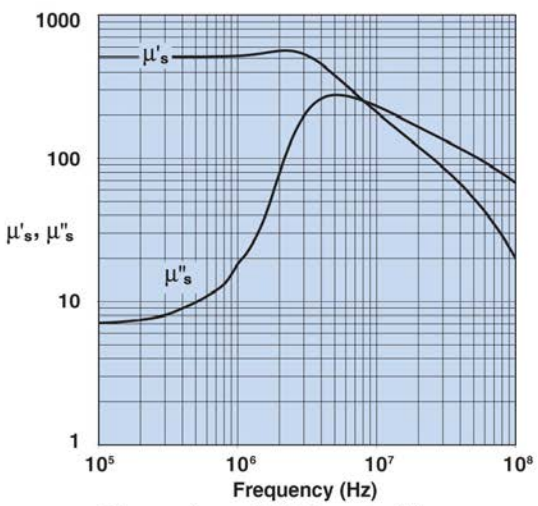
R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

3. 46 Material Characteristics

This is a MgZn ferrite intended Unit Symbol Value for suppression applications. This material does not use nickel in its composition, hence it avoids potential environmental issues as well as reduces the cost of the material component of suppression parts. The suppression performance of this 46 material is similar to the widely used 43 material.

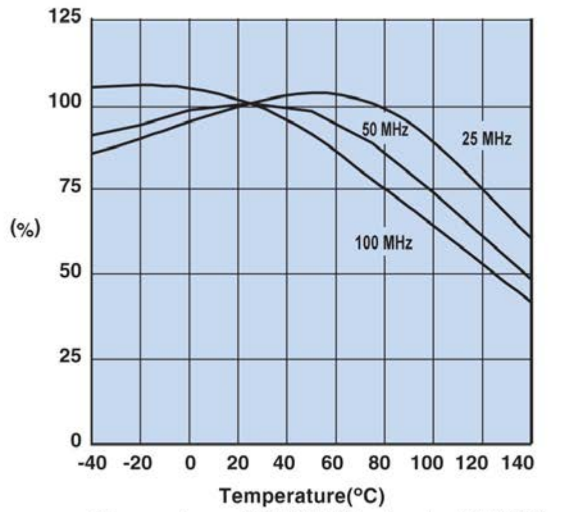
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	500
Flux Density @ Field Strength	gauss oersted	B H	3000 10
Residual Flux Density	gauss	B_r	1900
Coercive Force	oersted	H_c	0.40
Loss Factor @ Frequency	10^{-6} MHz	$\tan\delta/\mu_i$	60 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		---
Curie Temperature	°C	T_c	>150
Resistivity	Ω cm	ρ	$1x10^8$

Complex Permeability vs. Frequency



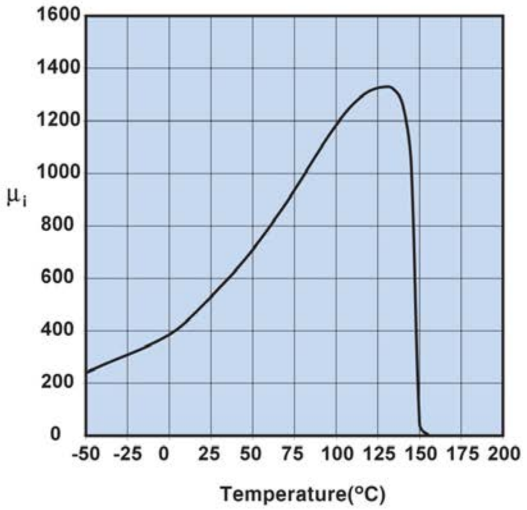
Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

Percent of Original Impedance vs. Temperature



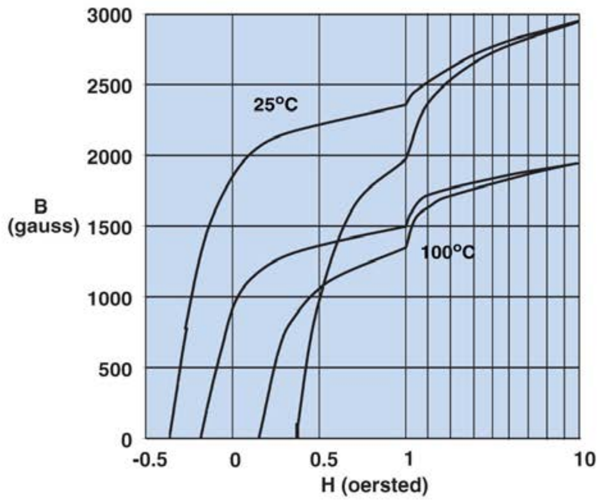
Measured on a 2646000301 using the HP4291A.

Initial Permeability vs. Temperature



Measured on a 17/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on a 17/10/6mm toroid at 10kHz.

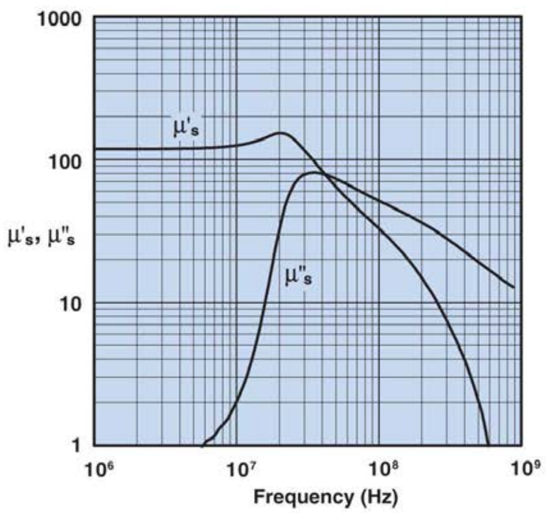
R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

4. 61 Material Characteristics

A high frequency NiZn ferrite developed for a range of inductive applications up to 25 MHz. This material is also used in EMI applications for suppression of noise frequencies above 200 MHz.
EMI suppression beads, beads on leads, SM beads, wound beads, multi-aperture cores, round cable EMI suppression cores, round cable snap-its, rods, antenna/RFID rods, and toroids are all available in 61 material.
Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

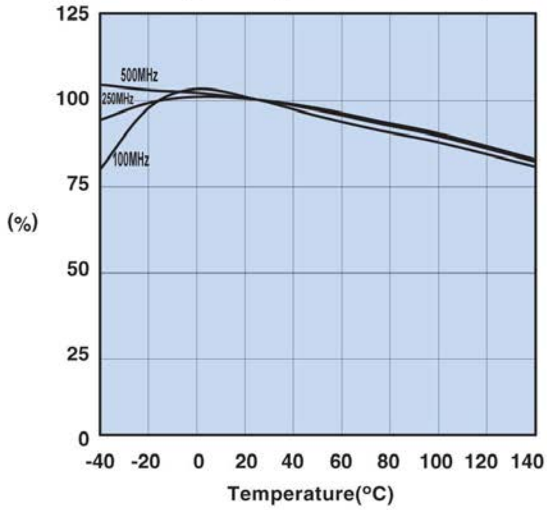
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	125
Flux Density @ Field Strength	gauss oersted	B H	2350 15
Residual Flux Density	gauss	B_r	1200
Coercive Force	oersted	H_c	1.8
Loss Factor @ Frequency	10^{-6} MHz	$Tan\delta/\mu_i$	30 1.0
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.10
Curie Temperature	°C	T_c	>300
Resistivity	Ω cm	ρ	$1x10^8$
Frequency range	MHz		>250

Complex Permeability vs. Frequency



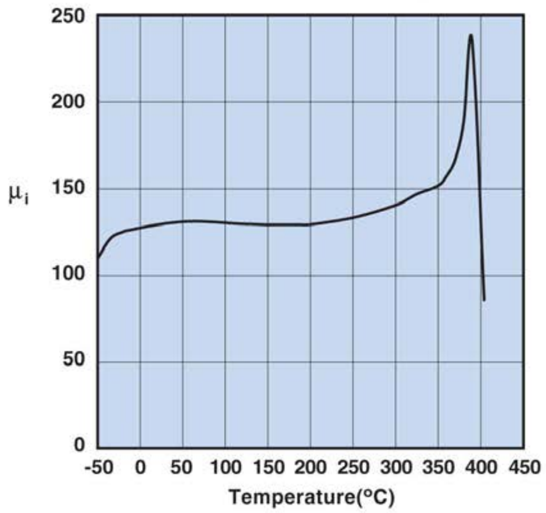
Measured on a 19/10/6mm toroid using the HP 4284A and the HP 4291A.

Percent of Original Impedance vs. Temperature



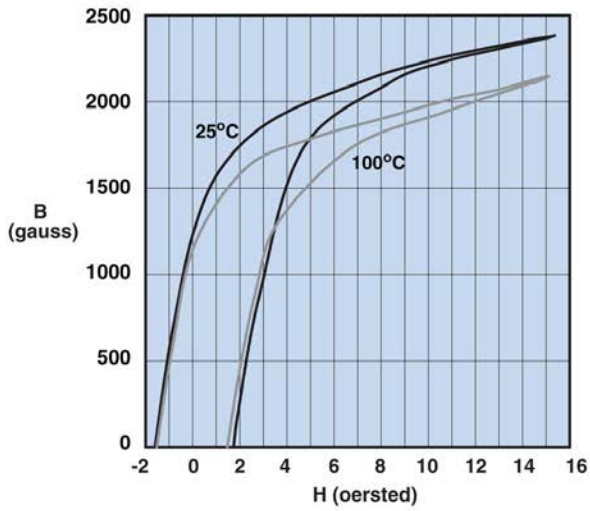
Measured on a 2661000301 using the HP4291A.

Initial Permeability vs. Temperature



Measured on a 19/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on a 19/10/6mm toroid at 10kHz.

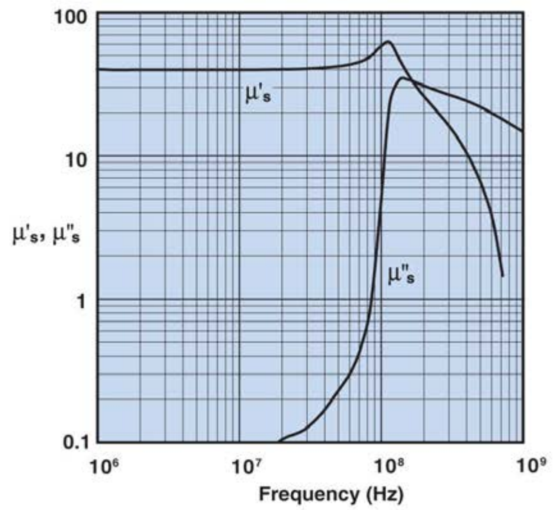
R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

5. 67 Material Characteristics

A high frequency NiZn ferrite for the design of broadband transformers, antennas and HF, high Q inductor applications up to 50 MHz. Toroids, multi-aperture cores and antenna/RFID rods are available in this material.
Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.

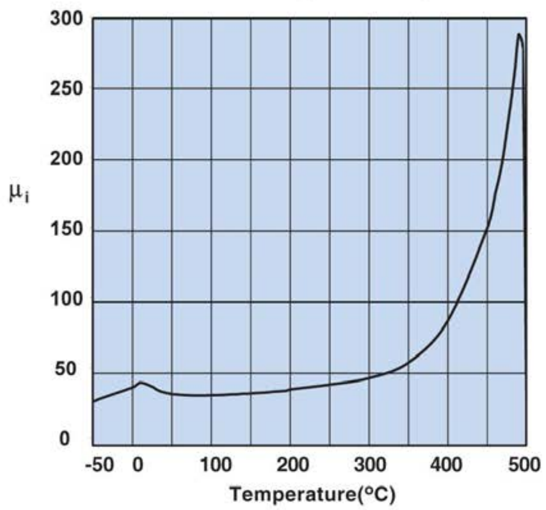
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	40
Flux Density @ Field Strength	gauss oersted	B H	2300 20
Residual Flux Density	gauss	B_r	800
Coercive Force	oersted	H_c	3.5
Loss Factor @ Frequency	10^{-6} MHz	$\tan\delta/\mu_i$	150 50
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.05
Curie Temperature	°C	T_c	>475
Resistivity	Ω cm	ρ	$1x10^7$
Frequency range	MHz		>250

Complex Permeability vs. Frequency



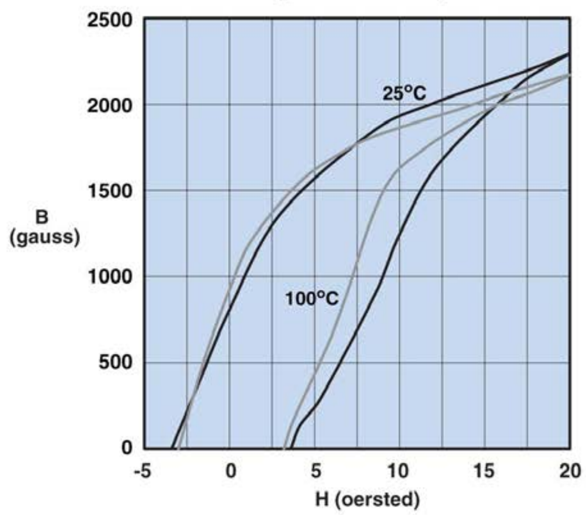
Measured on an 19/10/6mm toroid using the HP 4284A and the HP 4291A.

Initial Permeability vs. Temperature



Measured on a 19/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on a 19/10/6mm toroid at 10kHz.

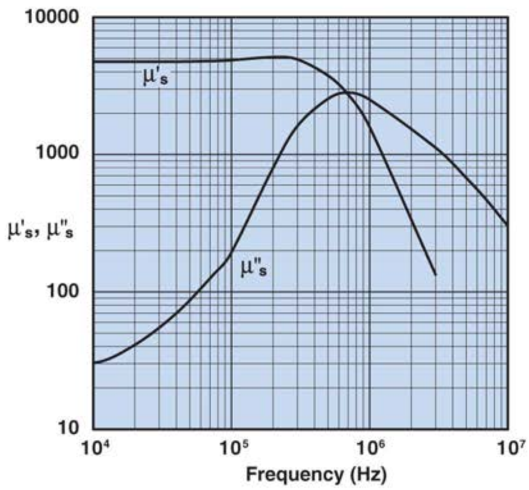
R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

6. 75 Material Characteristics

A high permeability MnZn ferrite intended for a range of broadband and pulse transformer applications and common-mode inductor designs.
Toroids and E&I cores are available in 75 material.

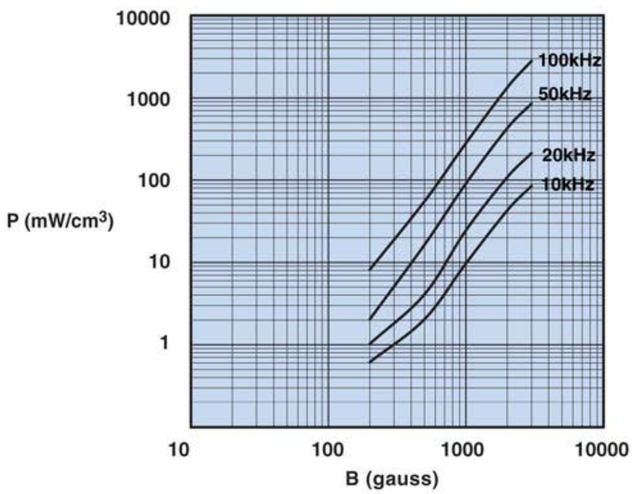
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	5000
Flux Density @ Field Strength	gauss oersted	B H	4300 5
Residual Flux Density	gauss	B_r	1400
Coercive Force	oersted	H_c	0.16
Loss Factor @ Frequency	10^{-6} MHz	$Tan\delta/\mu_i$	15 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.6
Curie Temperature	°C	T_c	>140
Resistivity	Ω cm	ρ	$3x10^2$
Frequency range	MHz		0.5 - 20

Complex Permeability vs. Frequency



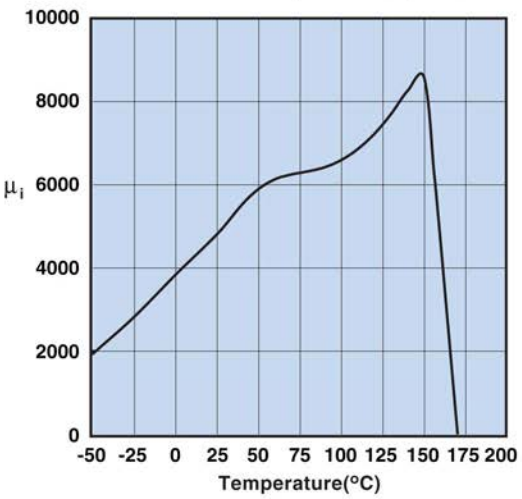
Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

Power Loss Density vs. Flux Density



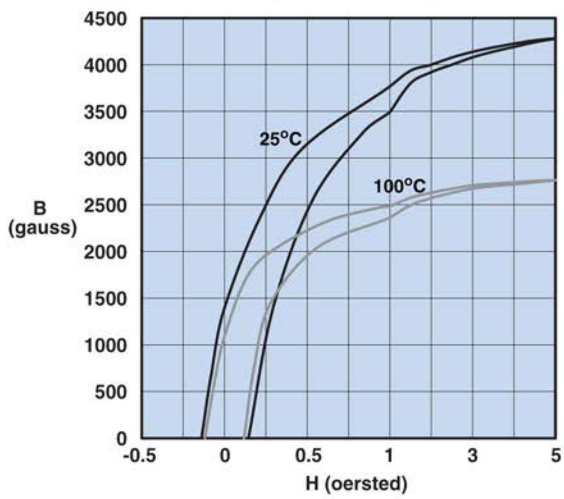
Measured on a 17/10/6mm toroid using the Clarke Hess 258 VAW at 100°C.

Initial Permeability vs. Temperature



Measured on a 17/10/6mm toroid at 10kHz.

Hysteresis Loop



Measured on a 17/10/6mm toroid at 10kHz.

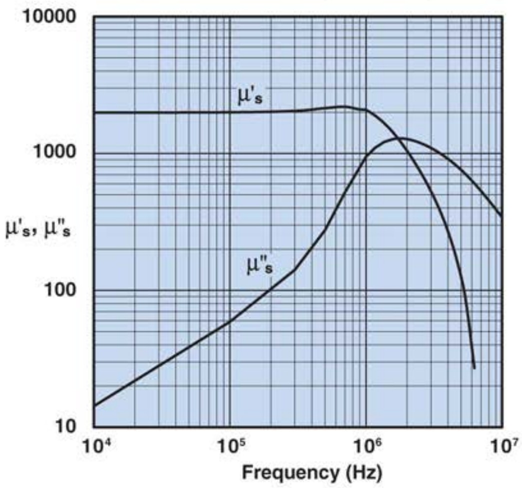
R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

7. 77 Material Characteristics

A MnZn ferrite for use in a wide range of high and low flux density inductive designs for frequencies up to 100 kHz.
E&I cores, U cores, rods, tack bobbin cores, toroids, and bobbins are all available in 77 material.

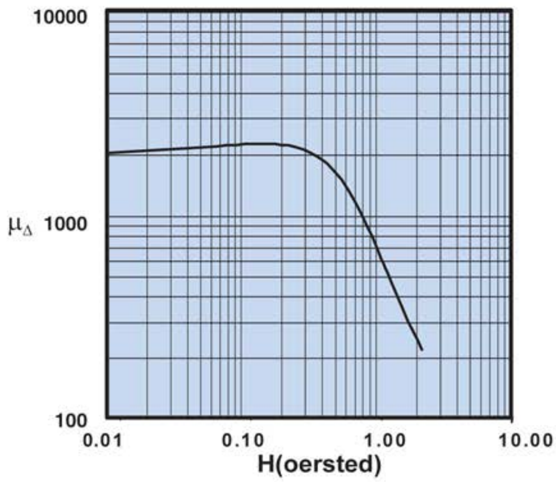
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	2000
Flux Density @ Field Strength	gauss oersted	B H	4900 5
Residual Flux Density	gauss	B_r	1800
Coercive Force	oersted	H_c	0.30
Loss Factor @ Frequency	10^{-6} MHz	$\tan\delta/\mu_i$	15 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.7
Curie Temperature	°C	T_c	>200
Resistivity	Ω cm	ρ	$1x10^2$
Frequency range	MHz		0.5 - 50

Complex Permeability vs. Frequency

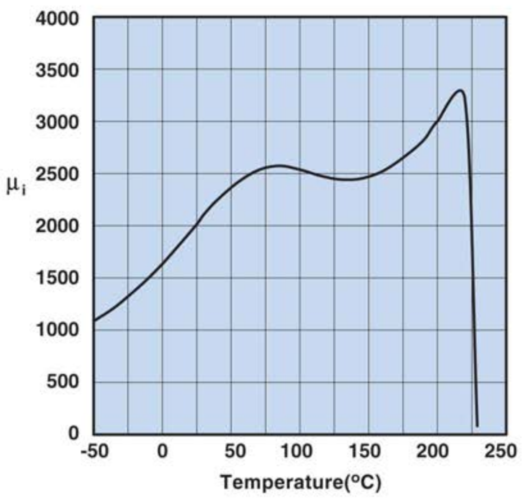


Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

Incremental Permeability vs. H

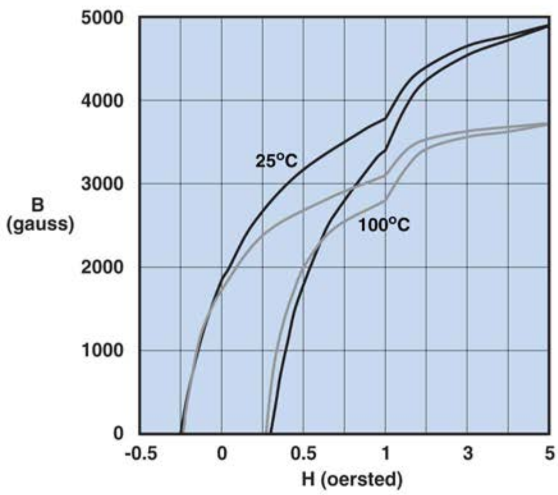


Initial Permeability vs. Temperature



Measured on an 18/10/6mm toroid at 100kHz.

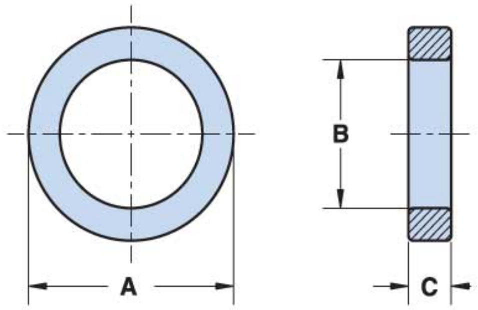
Hysteresis Loop



Measured on an 18/10/6mm toroid at 10kHz.

R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
Fax: +39 (0)2 99489276
E-mail: info@rfmicrowave.it
Web: www.rf-microwave.com

8. Dimensions



Part number	A (mm/inch)	B (mm/inch)	C (mm/inch)
FT-23-XX	5.95/.230	3.05/.120	1.65/.060
FT-37-XX	9.50/.375	4.75/.187	3.30/.125
FT-50-XX	12.7/.500	7.15/.281	4.90/.188
FT-50A-XX	12.7/.500	7.9/.312	6.35/.250
FT-82-XX	21.0/.825	13.2/.520	6.35/.250
FT-114-XX	29.0/1.142	19.0/.748	7.50/.295
FT-140-XX	35.55/1.400	23.0/.900	12.7/.500
FT-114-XX	29.0/1.142	19.0/.748	7.50/.295
FT-240-XX	61.0/2.400	35.55/1.400	12.7/.500
FT-290-XX	73.65/2.900	38.85/1.530	12.7/.500

9. Inductance rating & Other specifications

Σl/A = Core constant
l_e = Effective path length
A_e = Effective cross-sectional area
V_e = Effective core volume
A_L = Inductance factor ($\frac{L}{N^2}$)

Material					43	61	67	75	77
Part number	Σl/A (cm^{-1})	l_e (cm)	A_e (cm^2)	V_e (cm^3)	A_L ±25% (nH)				
FT-23-XX	63.8	1.30	0.02	0.027	158	25	-	975	420
FT-37-XX	28.6	2.07	0.072	0.15	350	55	18	2200	945
FT-50-XX	22.9	2.95	0.129	0.38	440	69	22	2725	1180
FT-50A-XX	20.8	3.12	0.15	0.47	480	-	-	-	-
FT-82-XX	21.3	5.2	0.243	1.26	470	75	-	3225	1175
FT-114-XX	19.8	7.3	0.37	2.70	510	80	-	-	1365
FT-140-XX	11.2	8.9	0.79	7.0	885	140	-	-	2400
FT-240-XX	9.2	14.5	1.58	22.8	1075	170	-	-	2950
FT-290-XX	7.8	16.7	2.15	35.9	1100	-	-	-	-

R.F. elettronica di Rota Fanco
Via Dante, 5
20030 Senago (MI)
Italy
Tel.: +39 (0)2 99487515
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Web: www.rf-microwave.com