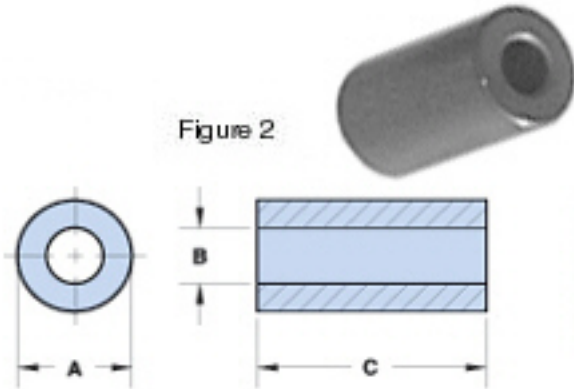




Figure 2



Part Number: 2677006302  
 Frequency Range: Lower Frequencies < 50 MHz (77 material)  
 Description: 77 SHIELD BEAD  
 Application: Suppression Components  
 Where Used: Cable Component  
 Part Type: Miscellaneous Suppression Cores  
 Preferred Part: ✓

## Mechanical Specifications

Weight: 2.200 (g)

## Part Type Information

Fair-Rite has tooled several special core geometries in the 43 & 77 material for suppression of conducted EMI.

-These suppression cores are controlled for impedance only. The impedances listed are typical values. Single turns tests are performed on the 4193A Vector Impedance Analyzer with the shortest practical wire length.

-For any non-catalog suppression core design feel free to contact our customer service or application group for feasibility and availability.

-The 'C' dimension, the core length, can be modified to suit specific applications.

-Explanation of Part Numbers: Digits 1&2 = product class and 3&4 = the material grade.



## Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	9.50	±0.25	0.375	-
B	4.75	+0.30	0.193	-
C	10.40	±0.25	0.410	-
D	-	-	-	-
E	-	-	-	-
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

## Electrical Specifications

Typical Impedance ( $\Omega$ )	
1 MHz	25
10 MHz+	40
25 MHz+	33

Electrical Properties	

## Land Patterns

V	W ref	X	Y	Z
-	-	-	-	-
-	-	-	-	-

## Winding Information

Turns	Wire	1st Wire	2nd Wire
Tested	Size	Length	Length
-	-	-	-

## Reel Information

Tape Width	Pitch	Parts 7 "	Parts 13 "	Parts 14 "
mm	mm	Reel	Reel	Reel
-	-	-	-	-

## Package Size

Pkg Size
-
(-)

## Connector Plate

# Holes	# Rows
-	-

### Legend

+ Test frequency

Preferred parts, the suggested choice for new designs, have shorter lead times and are more readily available.

The column H(Oe) gives for each bead the calculated dc bias field in oersted for 1 turn and 1 ampere direct current. The actual dc H field in the application is this value of H times the actual NI (ampere-turn) product. For the effect of the dc bias on the impedance of the bead material, see figures 18-23 in the application note How to choose Ferrite Components for EMI Suppression.

A ½ turn is defined as a single pass through a hole.

$\Sigma L/A$  - Core Constant

$A_e$  - Effective Cross-Sectional Area

$A_L$  - Inductance Factor ( $\frac{L}{N^2}$ )

N/AWG - Number of Turns/Wire Size for Test Coil

$l_e$  - Effective Path Length

$V_e$  - Effective Core Volume

NI - Value of dc Ampere-turns



## Ferrite Material Constants

Specific Heat .....	0.25 cal/g/°C
Thermal Conductivity .....	10x10 <sup>-3</sup> cal/sec/cm/°C
Coefficient of Linear Expansion .....	8 - 10x10 <sup>-6</sup> /°C
Tensile Strength .....	4.9 kgf/mm <sup>2</sup>
Compressive Strength .....	42 kgf/mm <sup>2</sup>
Young's Modulus .....	15x10 <sup>3</sup> kgf/mm <sup>2</sup>
Hardness (Knoop) .....	650
Specific Gravity .....	≈ 4.7 g/cm <sup>3</sup>

*The above quoted properties are typical for Fair-Rite MnZn and NiZn ferrites.*

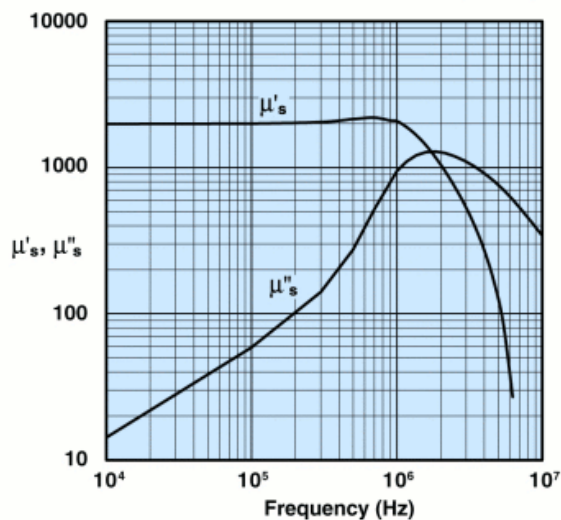
See next page for further material specifications.



### 77 Material Characteristics:

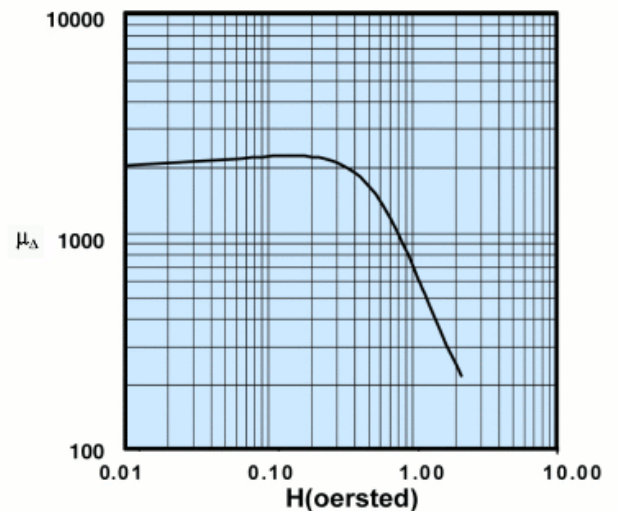
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	2000
Flux Density @ Field Strength	gauss oersted	B H	4900 5
Residual Flux Density	gauss	$B_r$	1800
Coercive Force	oersted	$H_c$	0.30
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta \mu_i$	15 0.1
Temperature Coefficient of Initial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

### Complex Permeability vs. Frequency

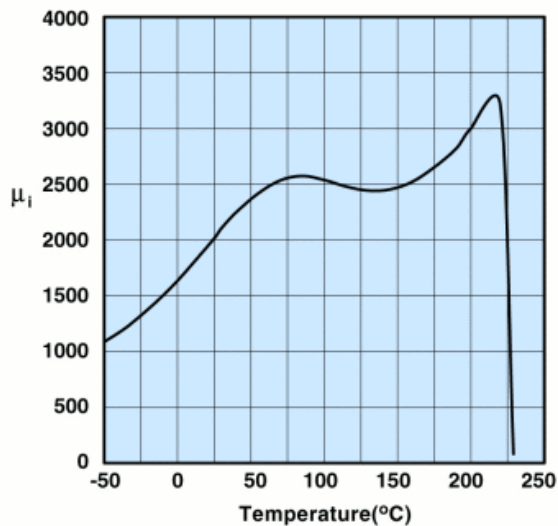


Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

### Incremental Permeability vs. H

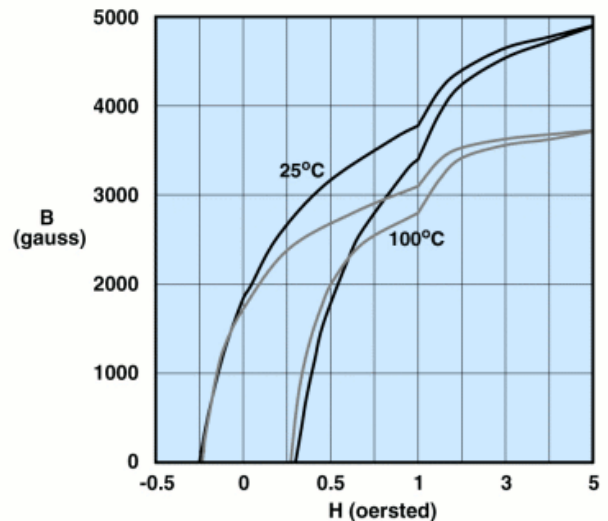


### Initial Permeability vs. Temperature



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

### Hysteresis Loop



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



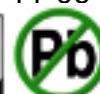
# Fair-Rite Products Corp.

## Your Signal Solution®

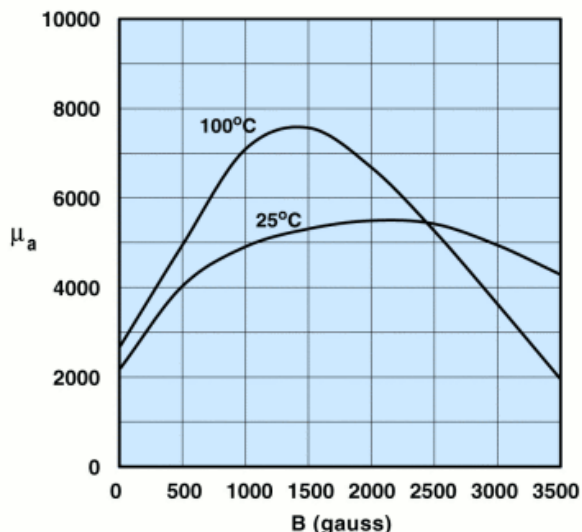
Ferrite Components for the Electronics Industry

Fair-Rite Products Corp. PO Box J, One Commercial Row, Wallkill, NY 12589-0288  
Phone: (888) 324-7748 www.fair-rite.com

Fair-Rite Product's Catalog  
Part Data Sheet, 2677006302  
Printed: 2010-11-09

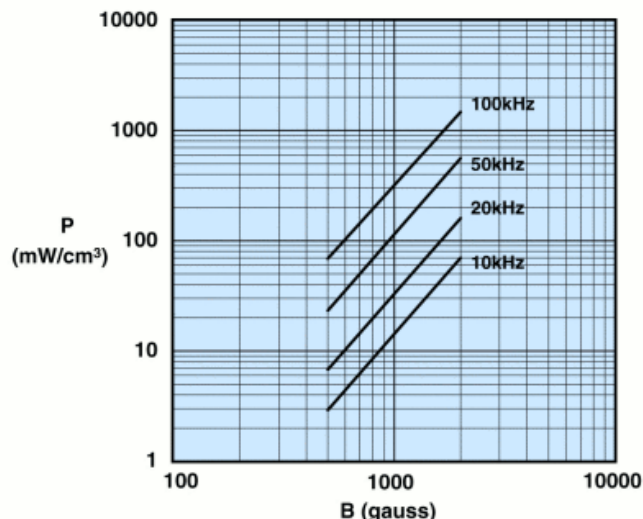


### Amplitude Permeability vs. Flux Density



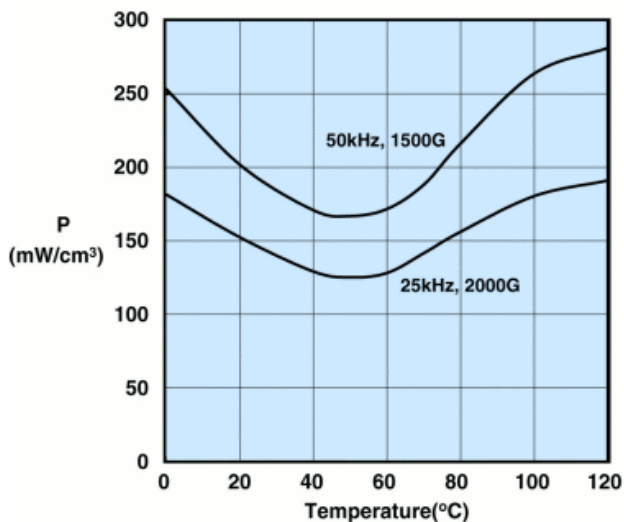
Measured on an 18/10/6mm toroid at 10kHz.

### Power Loss Density vs. Flux Density



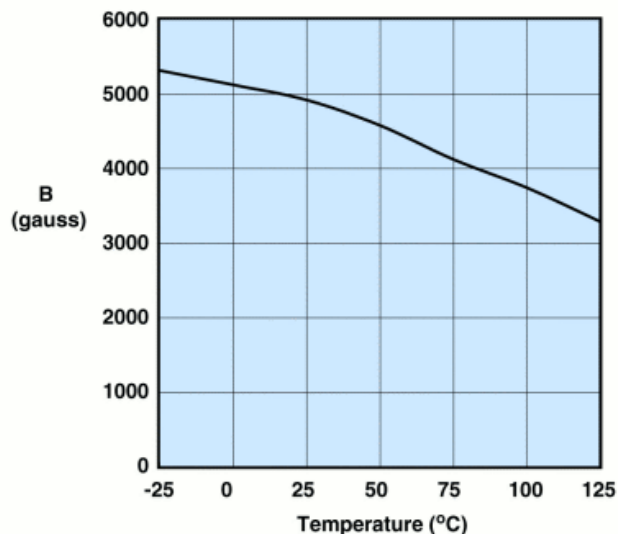
Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

### Power Loss Density vs. Temperature



Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW.

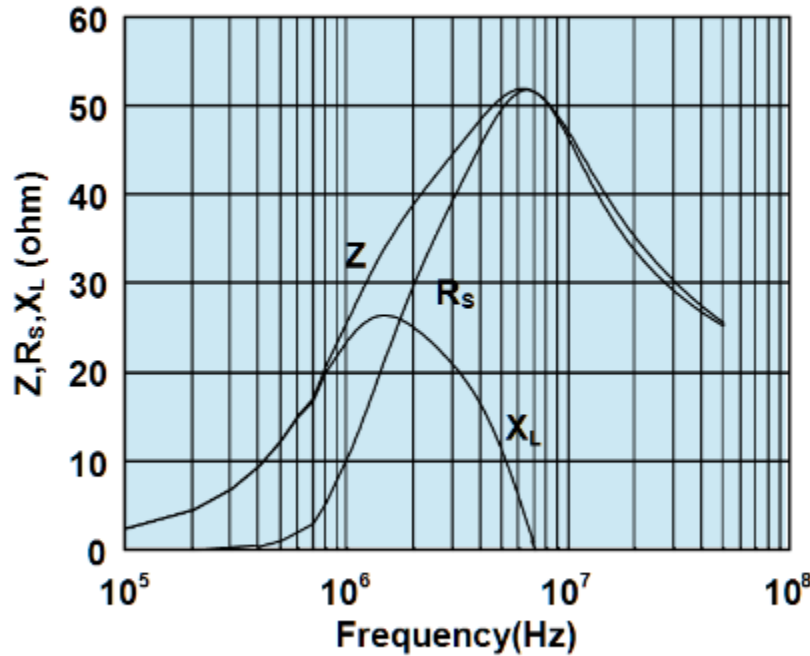
### Flux Density vs. Temperature



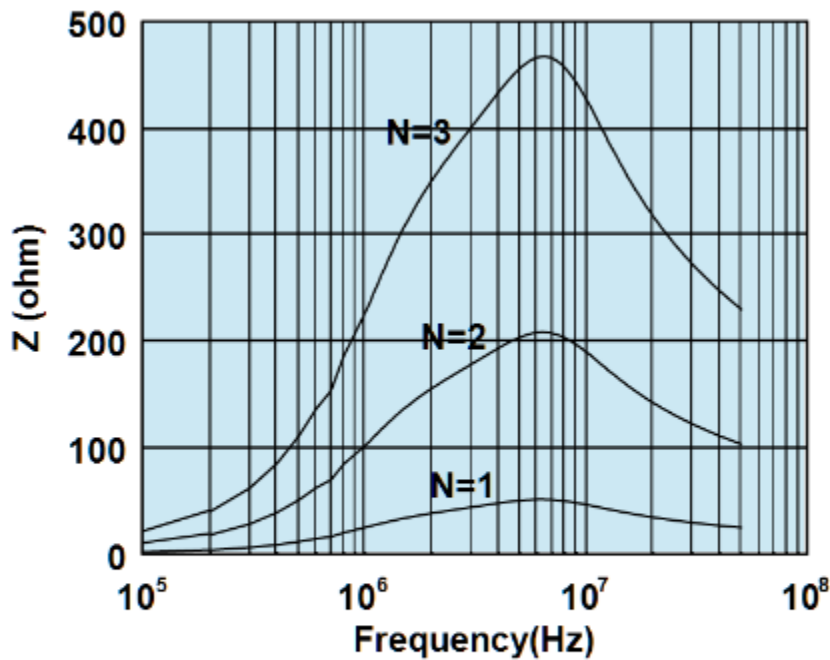
Measured on an 18/10/6mm toroid at 10kHz and H=5 oersted.



**2677006302**



Impedance, reactance, and resistance vs. frequency.



Impedance vs. frequency with one, two, and three turns.