



# 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, 9277008002  
Printed: 2013-02-27



✓RoHS  
Material  
Declaration

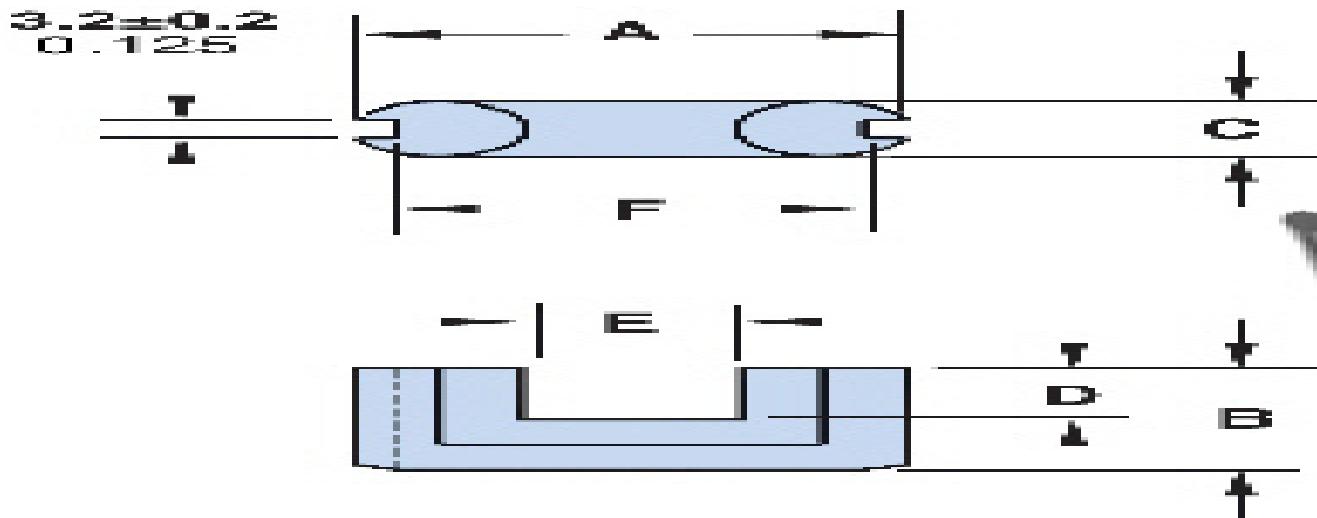


Figure 3

Part Number: 9277008002

Frequency Range: MnZn 77 material

Description: 77 U CORE

Application: Inductive Components

Where Used: Closed Magnetic Circuit

Part Type: U Cores

## Mechanical Specifications

Weight: 26.000 (g)

## Part Type Information

The U core offers an economical core design with a nearly uniform cross-sectional area. In a power ferrite material they are frequently used in output chokes, power input filters and transformers for switched-mode power supplies and HF fluorescent ballasts.

-Part number is for a single core.

-These U cores have the same minimum cross-sectional area as the listed effective cross-sectional area.

-AL value is measured at 1kHz, < 10 gauss.

-For any U core requirement not listed in the catalog, please contact our customer service group for availability and pricing.

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



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### Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	41.15	$\pm 0.75$	1.620	-
B	17.45	$\pm 0.15$	0.687	-
C	11.70	$\pm 0.25$	0.460	-
D	7.80	Min	0.307	Min
E	18.65	Min	0.735	Min
F	35.30	$\pm 0.60$	1.390	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

### Electrical Specifications

Typical Impedance ( $\Omega$ )	
Electrical Properties	
$A_L$ (nH)	1575 Min
$A_e$ (cm <sup>2</sup> )	0.98000
$\sum I/A$ (cm <sup>-1</sup> )	10.50
$l_e$ (cm)	10.30
$V_e$ (cm <sup>3</sup> )	10.10000

### Land Patterns

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

### Winding Information

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

### Reel Information

Tape Width mm	Pitch mm	Parts 7 " Reel	Parts 13 " Reel	Parts 14 " 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 1/2 turn is defined as a single pass through a hole.

$\sum I/A$  - 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



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## 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.



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A MnZn ferrite for use in a wide range of high and low flux density inductive designs for frequencies up to 100 kHz.

Pot cores, E&I cores, U cores, rods, toroids, and bobbins are all available in 77 material.

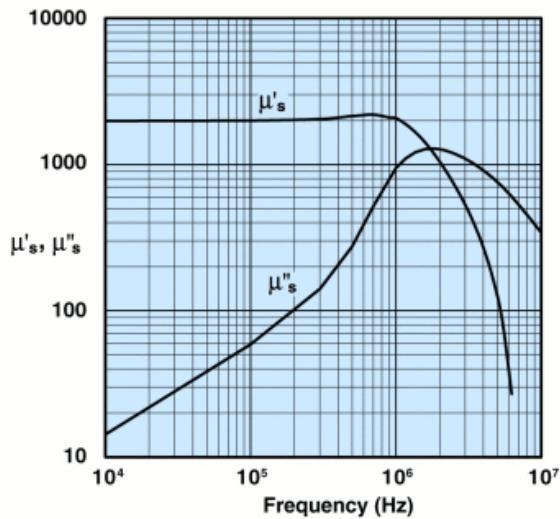
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### 77 Material Characteristics:

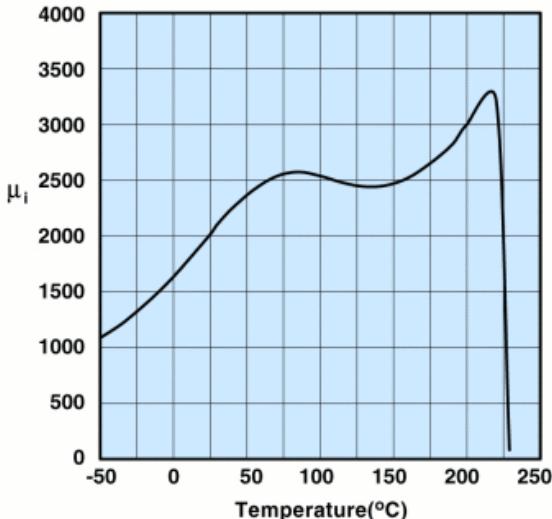
Property	Unit	Symbol	Value
Initial Permeability @ $B < 10$ gauss		$\mu_i$	2000
Flux Density @ Field Strength	gauss oersted	$B$ $H$	4900 5
Residual Flux Density	gauss	$B_r$	1800
Coercive Force	oersted	$H_c$	0.30
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta / \mu_i$	15 0.1
Temperature Coefficient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

### Complex Permeability vs. Frequency



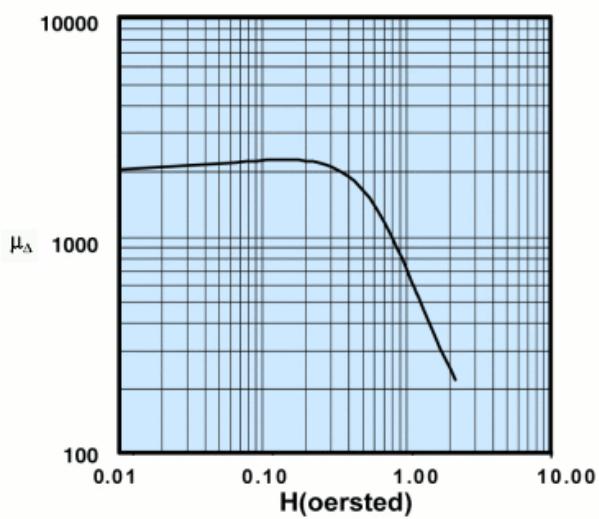
Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

### Initial Permeability vs. Temperature

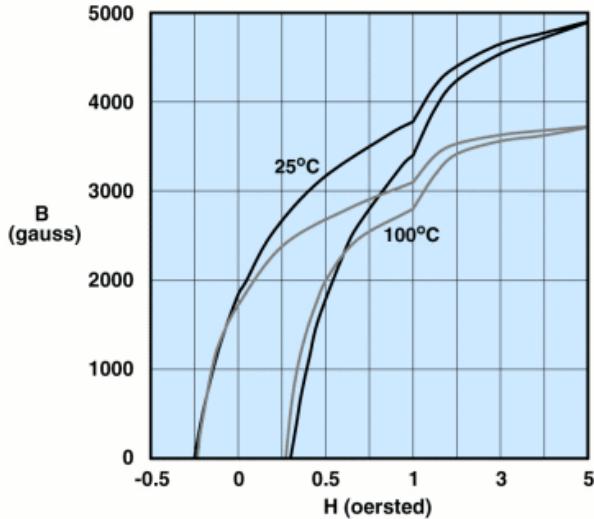


Measured on an 18/10/6mm toroid at 100kHz.

### Incremental Permeability vs. H



### Hysteresis Loop



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

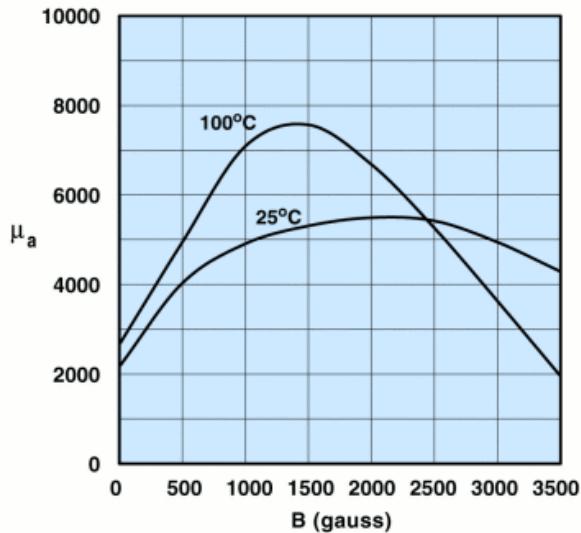


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## Amplitude Permeability vs. Flux Density

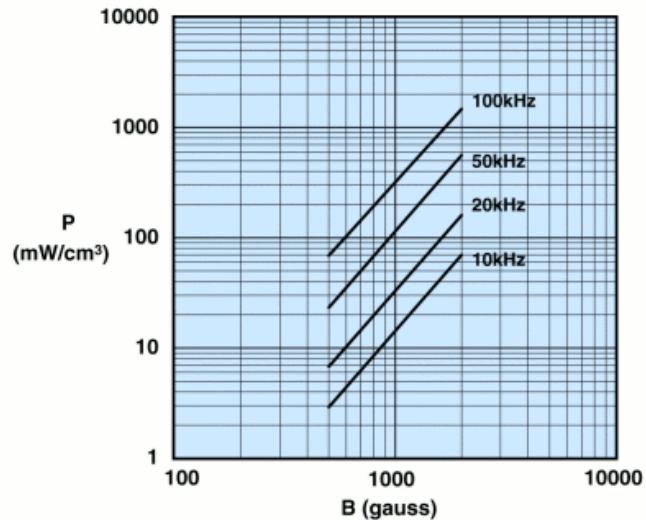


Measured on an 18/10/6mm toroid at 10kHz.

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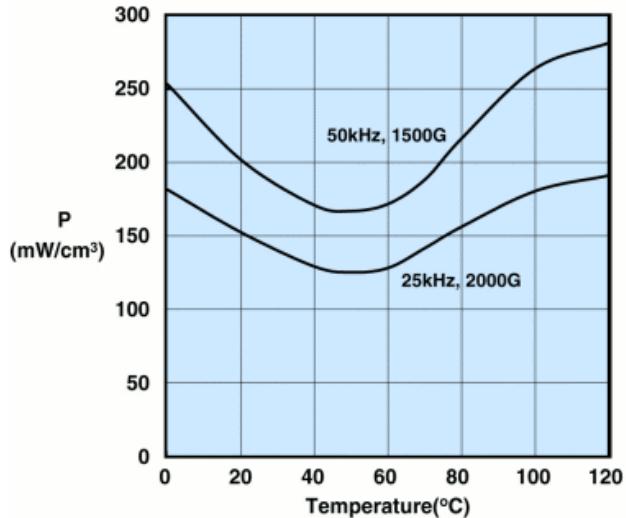


## Power Loss Density vs. Flux Density



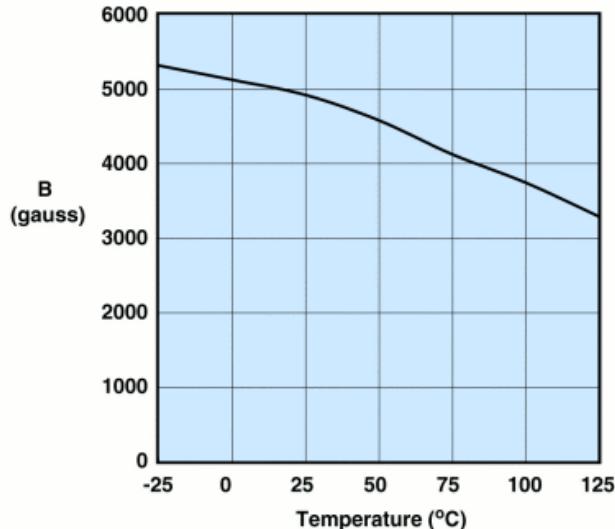
Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

## 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.