

**Figure 1**

Part Number: 2873002302  
 Frequency Range: Suppression Applications for Lower Frequencies < 50 MHz (73 material)  
 Description: 73 MULTI-APERTURE CORE  
 Application: Suppression Components  
 Where Used: Board Component  
 Part Type: Multi-Aperture cores

## Mechanical Specifications

Weight: .100 (g)

## Part Type Information

Multi-aperture cores are used in suppression applications and in balun (balance-unbalance) and other broadband transformers. They are also employed in airbag designs to prevent accidental activation.

-All multi-aperture cores are supplied burnished.

-Multi-aperture cores in 73 and 43 materials are controlled for impedance only. The 61 NiZn material is controlled for both impedance and AL value. The high frequency 67 material is controlled for AL value. Minimum impedance values are specified for the + marked frequencies. The minimum impedance is typically the listed impedance less 20%.

-Multi-aperture cores in 73 and 43 material are measured for impedance on the 4193A Vector Impedance Analyzer. The 61 and 67 multi-aperture cores are tested on the 4291A Impedance Analyzer. All impedance measurements are performed with a single turn to both holes, using the shortest practical wire length.

-The 61 and 67 material multi-hole beads are tested for AL value. The test frequency is 10 kHz at < 10 gauss. The test winding is five turns wound through both holes.

-For any multi-aperture requirement not listed here, feel free to contact our customer service group for availability and pricing.

-Our 'Multi-Aperture Core Kit' (part number 0199000036) is available for prototype evaluation.

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



## Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	3.45	±0.25	0.136	-
B	2.35	±0.25	0.093	-
C	2.00	±0.15	0.079	-
D	-	-	-	-
E	1.45	±0.10	0.057	-
F	-	-	-	-
G	-	-	-	-
H	0.75	+0.25	0.034	-
J	-	-	-	-
K	-	-	-	-

## Electrical Specifications

Typical Impedance ( $\Omega$ )	
10 MHz	35
25 MHz+	44

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 .....	<b>3.5 - 4.5 mW/cm - °C</b>
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.*

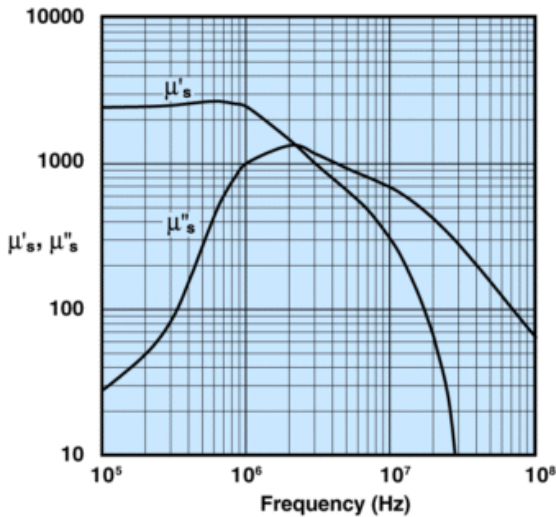
See next page for further material specifications.



### 73 Material Characteristics:

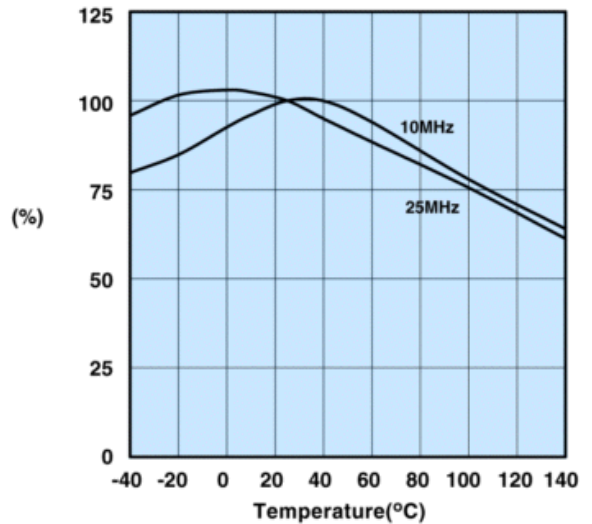
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	2500
Flux Density @ Field Strength	gauss oersted	B H	3900 5
Residual Flux Density	gauss	$B_r$	1500
Coercive Force	oersted	$H_c$	0.24
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta / \mu_i$	10 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.65
Curie Temperature	°C	$T_c$	>160
Resistivity	$\Omega$ cm	$\rho$	$1 \times 10^{-2}$

### Complex Permeability vs. Frequency



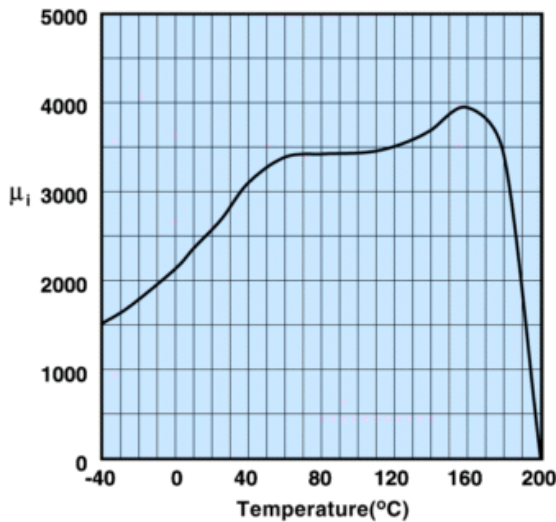
Measured on a 2673000301 bead using the HP 4284A and the HP 4291A.

### Percent of Original Impedance vs. Temperature



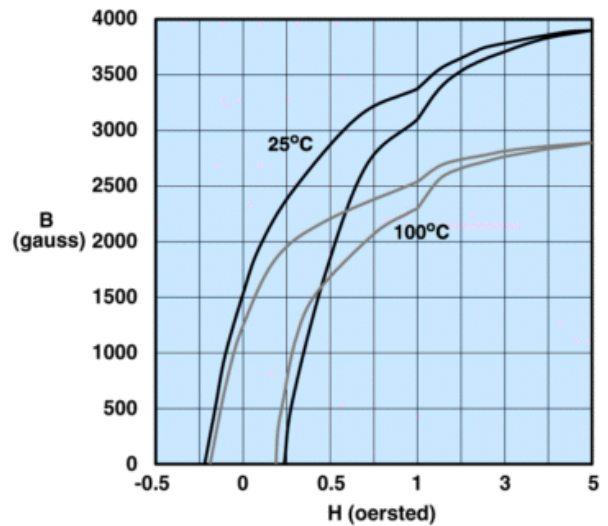
Measured on a 2673000301 using the HP4291A.

### Initial Permeability vs. Temperature



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

### Hysteresis Loop



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



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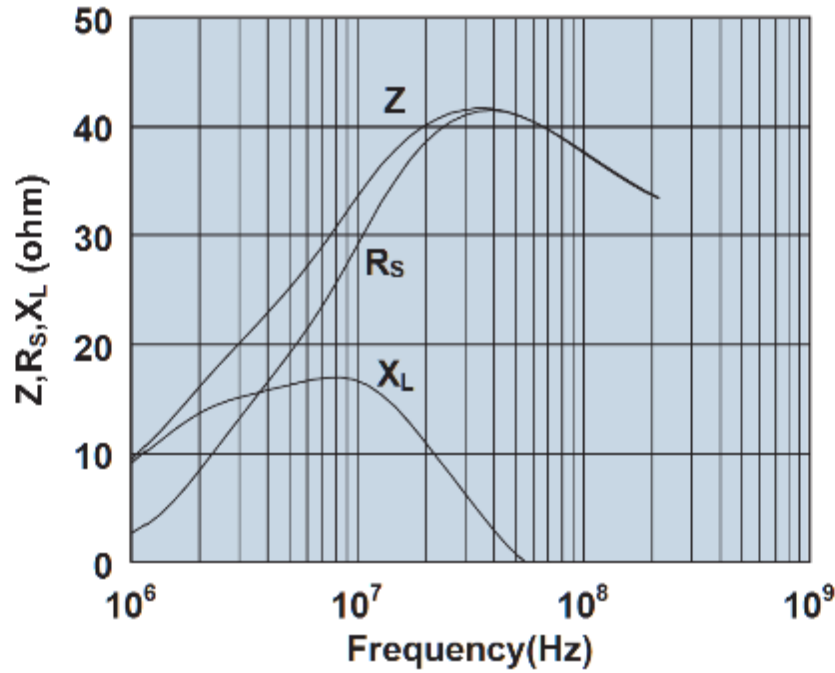
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Fair-Rite Products Corp. PO Box J, One Commercial Row, Wallkill, NY 12589-0288  
Phone: (888) 324-7748 www.fair-rite.com

Fair-Rite Product's Catalog  
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### 2873002302



Impedance, reactance, and resistance vs. frequency.

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