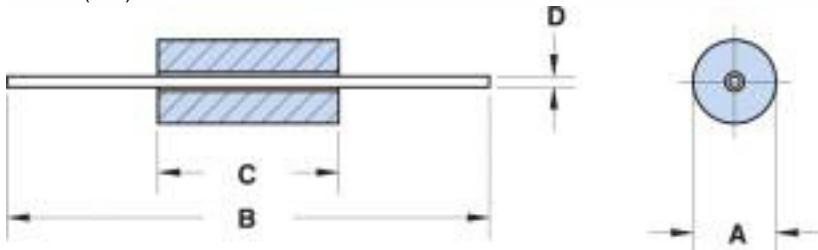




# Fair-Rite Products Corp. Your Signal Solution®

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](http://www.fair-rite.com)



Fair-Rite Product's Catalog  
Part Data Sheet, 2773015112  
Printed: 2013-07-03



Part Number: 2773015112

Frequency Range: Lower Frequencies < 50 MHz (73 material)

Description: 73 BEAD ON LEAD

Application: Suppression Components

Where Used: Board Component

Part Type: Beads-on-Leads

## Mechanical Specifications

Weight: .400 (g)

## Part Type Information

Ferrite suppression beads are supplied assembled on tinned copper wire for automated circuit board assembly.

-Parts with a '2' as the last digit of the part number are supplied taped and reeled per IEC 60286-1 and EIA RS-296-F standards. Taped and reeled parts are supplied 4500 pieces on a 14" reel. Taping details: Component pitch 5 mm. Inside tape spacing 52.5 mm. Tape width 6 mm.

-Beads-on-leads can be supplied bulk packed. The last digit of bulk packed parts is a '1'.

-Wires are oxygen free high conductivity copper with 100% matte tin plating over a nickel undercoating. The resistance of the wire is 3.5 mOhm for the 22 AWG and 2.2 mOhm for the 20 AWG wire.

-Beads-on-leads are controlled for impedances only. Minimum impedance values are specified for the + marked frequencies. The minimum impedance is typically the listed impedance less 20%. The impedances of the 73 & 43 beads-on-leads are measured on the 4193A Vector Impedance Analyzer. The 61 beads-on-leads are tested for impedance on the 4291A RF Impedance Analyzer.

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

-Our 'Bead-on-Lead Suppression Kit' (part number 0199000028) is available for prototype evaluation.

-Explanation of Part Numbers: Digits 1&2 = product class, 3&4 = material grade and last digit 1 = bulk packed, 2 = taped and reeled.



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**RoHS**  
Material Declaration

### Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	3.50	$\pm 0.25$	0.138	-
B	62.00	$\pm 1.50$	2.440	-
C	5.25	$\pm 0.25$	0.206	-
D	0.65	-	-	22 AWG
E	-	-	-	-
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

### Electrical Specifications

Typical Impedance ( $\Omega$ )	
1 MHz	17
5 MHz	43
10 MHz+	55
25 MHz+	68

Electrical Properties	

### 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
6	5	-	-	4500

### 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

$I_e$ : 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 .....	<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.



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A MnZn ferrite, supplied only in small cores, to suppress conducted EMI frequencies below 50 MHz.

EMI suppression beads, beads on leads, SM beads, and multi-aperture cores are all available in 73 material.

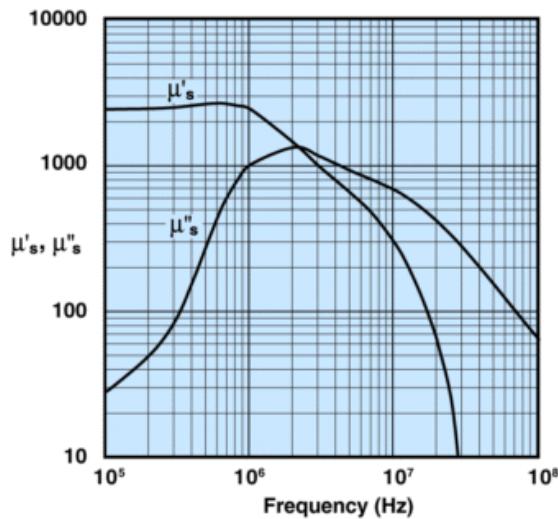
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### 73 Material Characteristics:

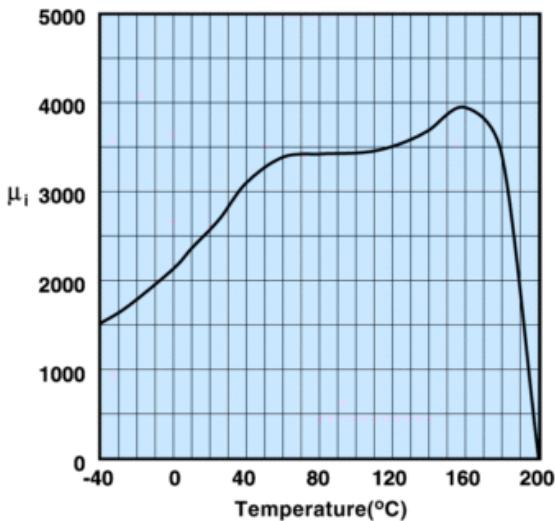
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	2500
Flux Density @ Field Strength	gauss oersted	B H	3900 5
Residual Flux Density	gauss	$B_r$	1500
Coercive Force	oersted	$H_c$	0.24
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan\delta/\mu_i$	10 0.1
Temperature Coefficient of Initial 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



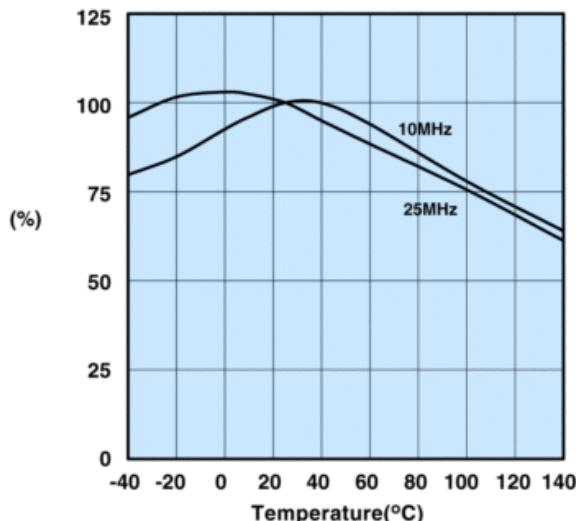
Measured on a 2673000301 bead using the HP 4284A and the HP 4291A.

### Initial Permeability vs. Temperature



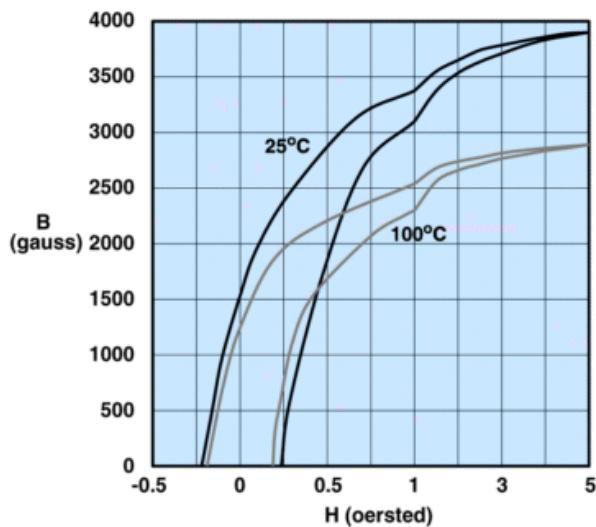
Measured on a 17/10/6mm toroid at 10kHz.

### Percent of Original Impedance vs. Temperature



Measured on a 2673000301 using the HP4291A.

### Hysteresis Loop



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



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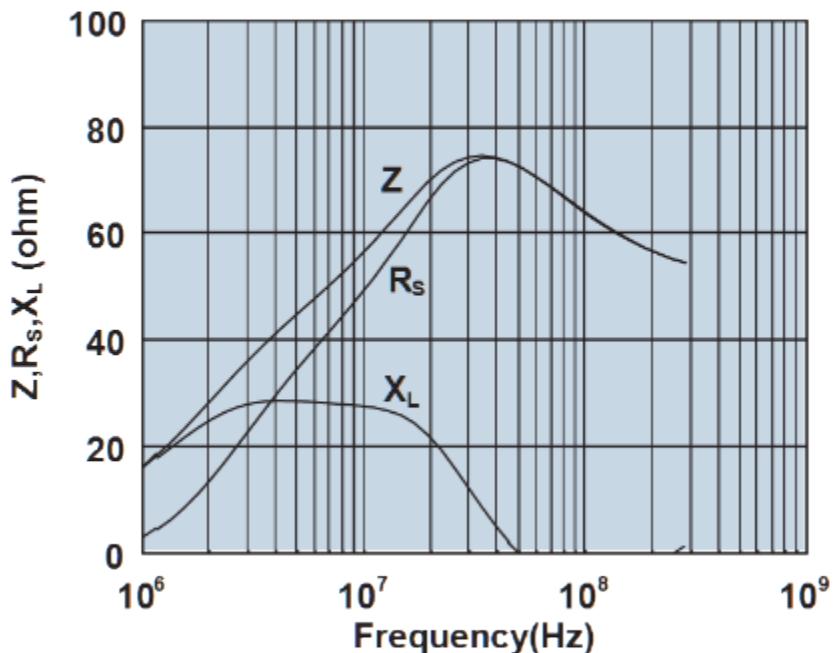
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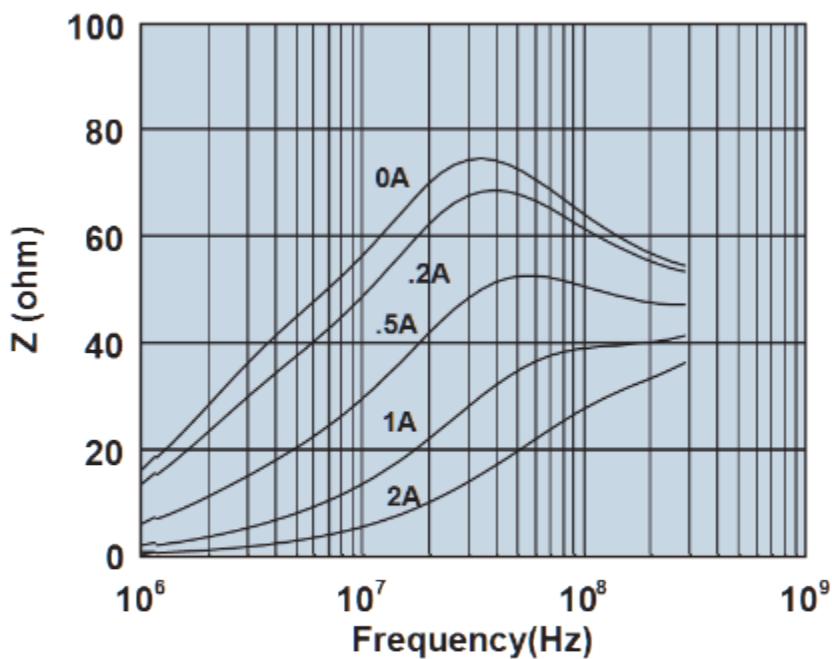


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Impedance, reactance, and resistance vs. frequency.



Impedance vs. frequency with dc bias.

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