

Figure 2

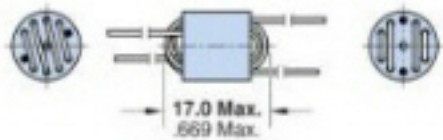


Figure 2-2



Part Number: 2944777721  
 Frequency Range: Broadband Frequencies 1-200 MHz (44 material)  
 Description: 44 WOUND BEAD  
 Application: Suppression Components  
 Where Used: Board Component  
 Part Type: Wound Beads  
 Preferred Part: ✓

## Mechanical Specifications

Weight: 3.900 (g)

## Part Type Information

Six and eleven hole beads, in two NiZn materials, are available both as beads (product class 26) and wound with tinned copper wire in several winding configurations (product class 29).

-Parts with a '1' as the last digit of the part number are supplied bulk packed. Wound beads with part numbers 29--666631 and 29--666651 can be supplied radially taped and reeled per IEC 60286-1 and EIA 468-B standards. For these taped and reeled wound beads the last digit of the part number is a '4'. Taped and reeled wound beads are supplied 500 pieces on a 13" reel.

-Wire used for winding is oxygen free high conductivity copper with a lead-free tin plating.

-Beads are controlled for impedance limits only. The impedances listed are typical values. Minimum impedance values are specified for the + marked frequencies. The minimum guaranteed impedance is the listed impedance less 20%. The 44 material beads and wound beads are tested on the 4193A Vector Impedance Meter. The 61 material parts on the 4191A RF Impedance Analyzer.

-Recommended storage temperature and operating temperature is -55°C to 125°C

-For any wound bead requirement not listed in here, please contact our customer service group for availability and pricing.

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



# Fair-Rite Products Corp.

## Your Signal Solution®

Ferrite Components for the Electronics Industry

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Fair-Rite Product's Catalog  
Part Data Sheet, 294477721  
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### Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	10.00	±0.25	0.394	-
B	0.90	+0.15	0.038	-
C	10.00	±0.25	0.394	-
D	7.50	Ref	0.295	Ref
E	-	-	-	-
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

### Electrical Specifications

Typical Impedance (Ω)	
1 MHz	45
10 MHz+	375
50 MHz+	905
100 MHz+	500
200 MHz	400

Electrical Properties	

### Land Patterns

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

### Winding Information

Turns Tested	Wire Size	1st Wire Length	2nd Wire Length
2 x 2½	0.65 22 AWG	38.0 ±3.0 1.500	28.0 ±3.0 1.102

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

Σl/A - Core Constant

A<sub>e</sub> - Effective Cross-Sectional Area

A<sub>L</sub> - Inductance Factor (L/N<sup>2</sup>)

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

l<sub>e</sub> - Effective Path Length

V<sub>e</sub> - 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.



#### 44 Material Characteristics:

Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	500
Flux Density @ Field Strength	gauss oersted	B H	3000 10
Residual Flux Density	gauss	$B_r$	1100
Coercive Force	oersted	$H_c$	0.45
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta \mu_i$	125 1.0
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		0.75
Curie Temperature	°C	$T_c$	>160
Resistivity	$\Omega$ cm	$\rho$	$1 \times 10^9$

A NiZn ferrite developed to combine a high suppression performance, from 30 MHz to 500 MHz, with a very high dc resistivity.

SM beads, PC beads, wound beads, round cable snap-its, and connector EMI suppression plates are all available in 44 material.

#### Complex Permeability vs. Frequency



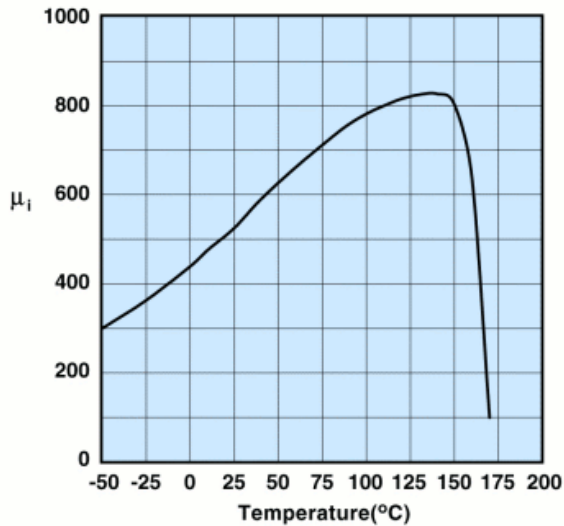
Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

#### Percent of Original Impedance vs. Temperature



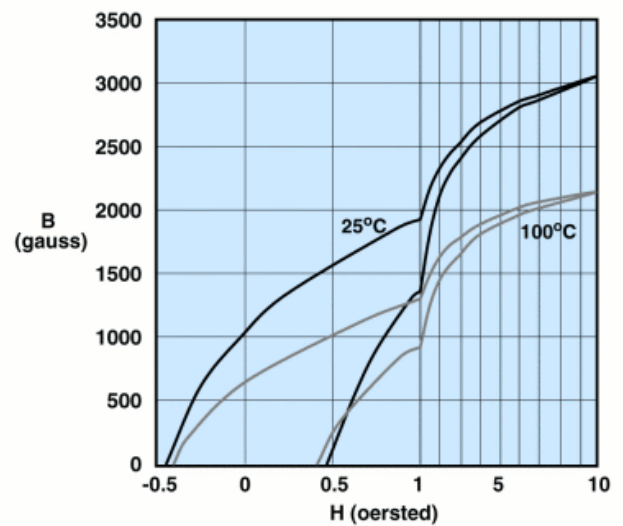
Measured on a 2644000301 using the HP4291A.

#### Initial Permeability vs. Temperature



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

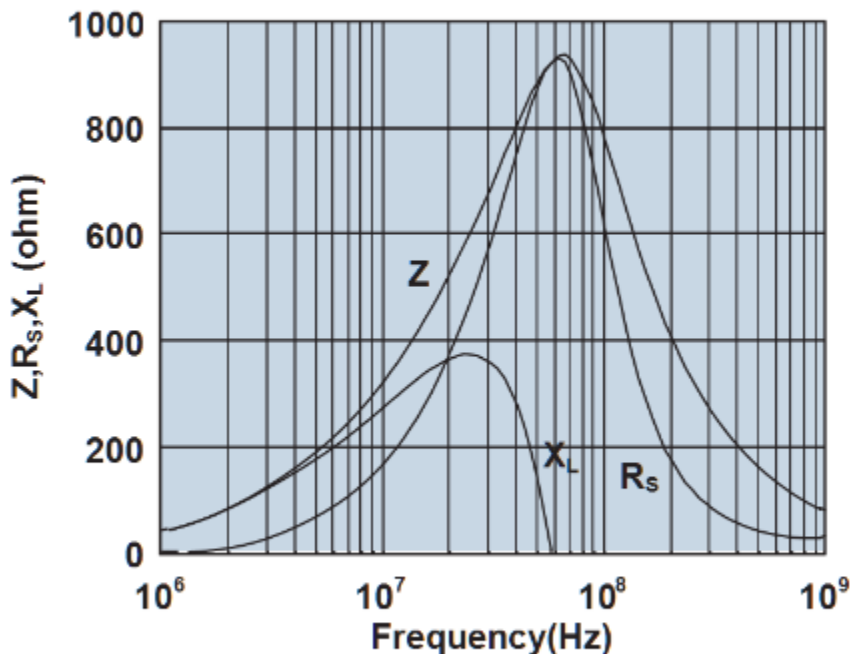
#### Hysteresis Loop



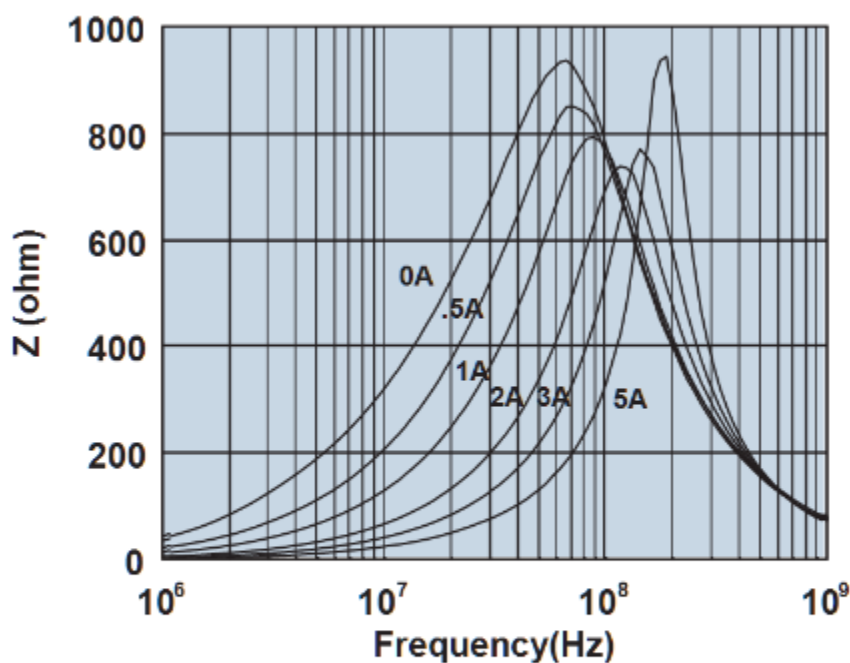
Measured on a 17/10/6mm toroid at 10kHz.



### 294477721



Impedance, reactance, and resistance vs. frequency.



Impedance vs. frequency with dc bias.