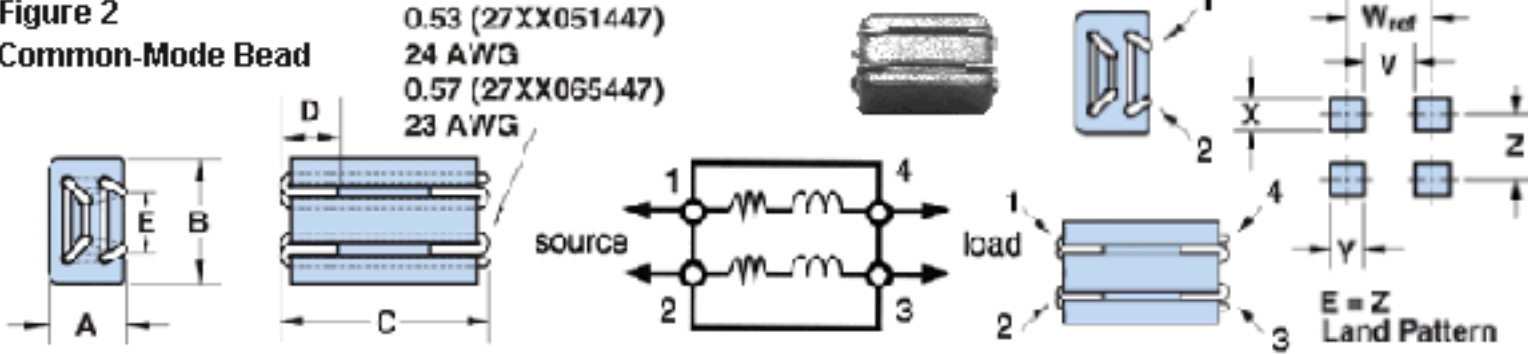




**Figure 2**  
**Common-Mode Bead**



**Pin out numbers are for reference only and not marked on components**

Part Number: 2744065447  
 Frequency Range: Broadband Frequencies 10-300 MHz (44 material)  
 Description: 44 COMMON MODE SM BEAD  
 Application: Suppression Components  
 Where Used: Board Component  
 Part Type: SM Beads (Common-Mode)

## Mechanical Specifications

Weight: 1.800 (g)

## Part Type Information

Surface mount common-mode beads are available from Fair-Rite in several materials and sizes. The common-mode bead provides a common magnetic path for the flux generated by the current to the load and the return current from the load. The current compensation results in zero magnetic flux in the bead.

-SM Beads on 12 mm tape width are supplied taped and reeled per EIA 481 and IEC 60286-3 standards. SM Beads on 16 and 24 mm tape widths are supplied taped and reeled per EIA 481 and IEC 60286-3 standards. Taped and reeled parts are supplied on a 13" reel.

-SM Beads can also be supplied not taped and reeled and then are bulk packed. This packing method will change the last digit of the part number to a '6'.

-Wires are oxygen free high conductivity copper with 100% matte tin plating over a nickel undercoating.

-SM Beads meet the solderability specifications when tested in accordance with MIL-STD-202, method 208. After dipping the mounting site of the bead, the solder surface shall be at least 95% covered with a smooth solder coating. The edges of the copper strip are not specified as solderable surfaces.

-After preheating the beads to within 100 oC of the soldering temperature, the parts meet the resistance to soldering requirements of EIA-186-10E, temperature 260±5 oC and time 10±1 seconds.

-Suggested land patterns are in accordance with the latest revision of IPC-7351.

-SM Beads are controlled for impedance limits only. Minimum impedance values are specified for the + marked frequencies. The minimum impedance is typically the listed value less 20%. SM Beads in 44 materials are measured for impedance on the 4193 Vector Impedance Analyzer. The 52 SM Beads are tested for impedance on the 4291A RF Impedance Analyzer.

-Recommended storage and operation temperature is -55 oC to 125 oC.

-The maximum current rating for these SM Beads is 5 amps.

-For any SM Bead requirement not listed, please contact our customer service group for availability and pricing.

-Our Surface Mount Bead Kit' (part number 0199000025) is available for prototype evaluation.

-Explanation of Part Numbers: Digits 1&2 = product class, 3&4 = material grade, last digit 6 = bulk packed, 7 = taped and reeled.



## Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	5.30	Max	0.209	Max
B	7.00	Max	0.275	Max
C	14.80	Max	0.582	Max
D	2.50	±0.50	0.098	-
E	3.00	±0.10	0.118	-
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

## Electrical Specifications

Typical Impedance ( $\Omega$ )	
10 MHz	95
25 MHz+	145
100 MHz+	255
250 MHz	-
300 MHz	315

Electrical Properties	
Max Rdc(m $\Omega$ )	4.10

## Land Patterns

V	W ref	X	Y	Z
6.800	11.800	1.100	5.000	3.000
0.268	0.465	0.043	0.197	0.118

## 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
24	12	-	1000	-

## 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.*

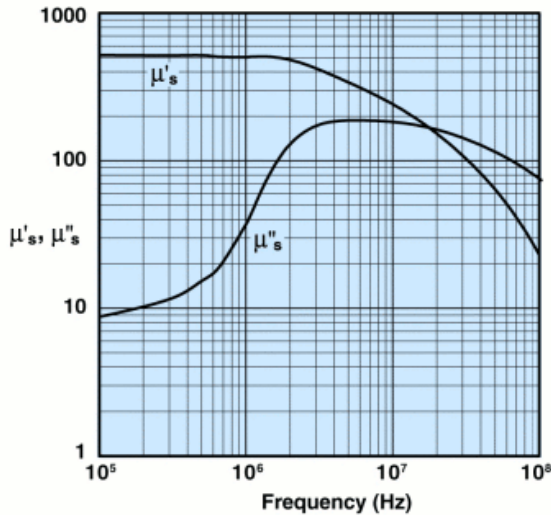
See next page for further material specifications.



#### 44 Material Characteristics:

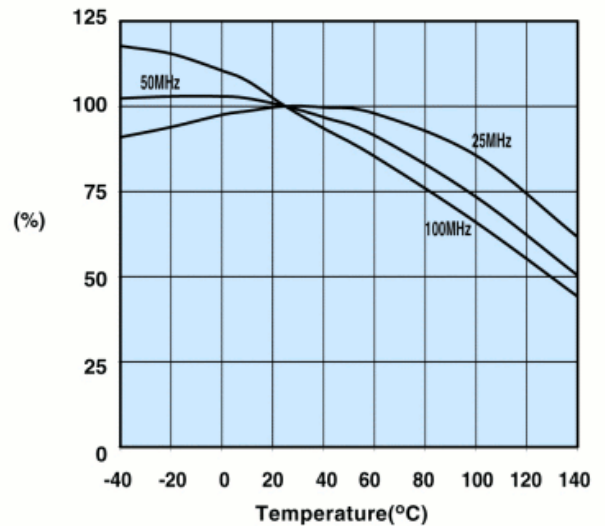
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	500
Flux Density @ Field Strength	gauss oersted	B H	3000 10
Residual Flux Density	gauss	$B_r$	1100
Coercive Force	oersted	$H_c$	0.45
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta \mu_i$	125 1.0
Temperature Coefficient of Initial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

**Complex Permeability vs. Frequency**



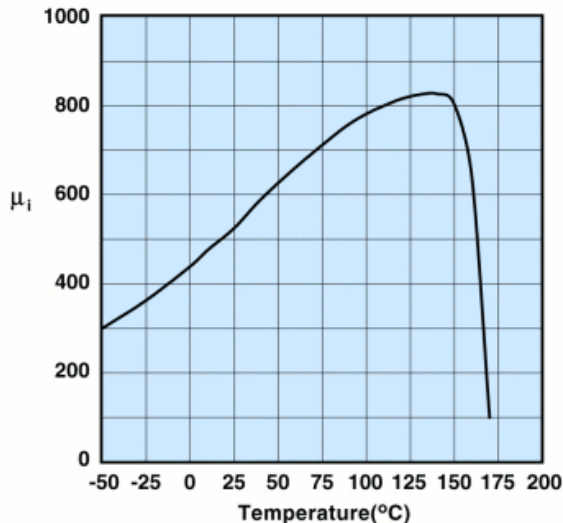
Measured on a 17/10/6mm toroid using the HP 4284A and the HP 4291A.

**Percent of Original Impedance vs. Temperature**



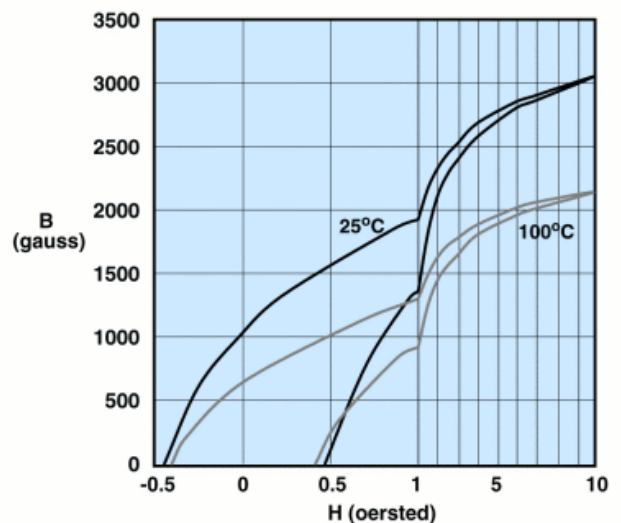
Measured on a 2644000301 using the HP4291A.

**Initial Permeability vs. Temperature**



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

**Hysteresis Loop**



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



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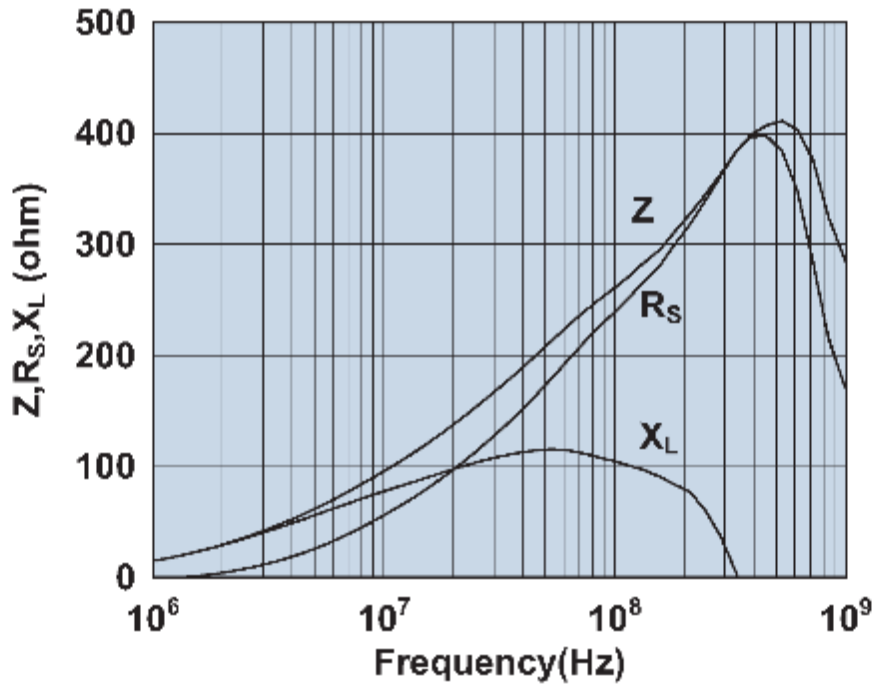
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### 2744065447



Impedance, reactance, and resistance vs. frequency.