

Land Pattern  
for Fig. 1

Part Number: 2773044447  
 Frequency Range: Lower Frequencies < 50 MHz (73 material)  
 Description: 73 SM BEAD  
 Application: Suppression Components  
 Where Used: Board Component  
 Part Type: SM Beads (Differential-Mode)  
 Preferred Part: ✓

## Mechanical Specifications

Weight: .090 (g)

## Part Type Information

Surface mount beads are available from Fair-Rite in several materials and sizes. Their rugged construction lowers the dc resistance and increases current carrying capacity compared to plated beads.

-SM Beads on 12 mm tape width are supplied taped and reeled per EIA 481-1 and IEC 60286-3 standards. SM Beads on 16 and 24 mm tape widths are supplied taped and reeled per EIA 481-2 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'.

-The copper conductors have a lead-free tin coating.

-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. The impedances listed are typical values. Minimum impedance values are specified for the + marked frequencies. The minimum guaranteed impedance is the listed value less 20%. SM Beads in 73, 43 and 44 materials are measured for impedance on the 4193 Vector Impedance Analyzer. The 52 and 61 SM Beads are tested for impedance on the 4191A RF Impedance Analyzer.

-Recommended storage and operation temperature is -55°C to 125°C.

-The maximum practical 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' 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	1.75	Max	0.068	Max
B	3.10	±0.10	0.122	-
C	5.65	±0.45	0.222	-
D	1.55	±0.50	0.061	-
E	-	-	-	-
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

## Electrical Specifications

Typical Impedance (Ω)	
1 MHz	9
5 MHz	19
10 MHz+	25
25 MHz+	33

Electrical Properties	
Max Rdc(mΩ)	1.10

## Land Patterns

V	W ref	X	Y	Z
1.500 0.059	4.500 0.177	1.800 0.071	3.000 0.118	- -

## 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
12	8	-	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 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 ( $\frac{L}{N^2}$ )

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.*

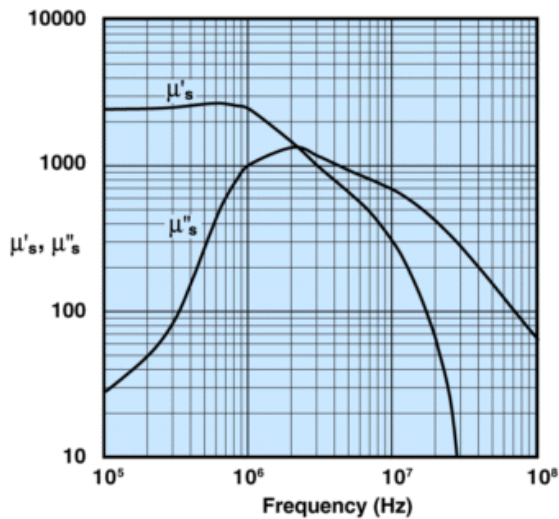
See next page for further material specifications.



### 73 Material Characteristics:

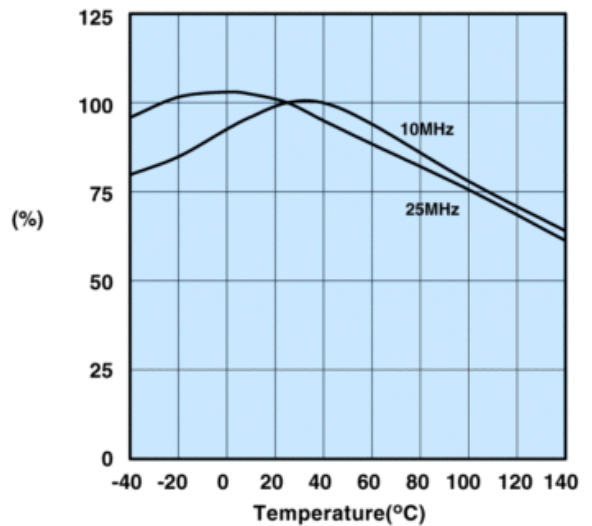
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	2500
Flux Density @ Field Strength	gauss oersted	B H	3900 5
Residual Flux Density	gauss	$B_r$	1500
Coercive Force	oersted	$H_c$	0.24
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta / \mu_i$	10 0.1
Temperature Coefficient of Initial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



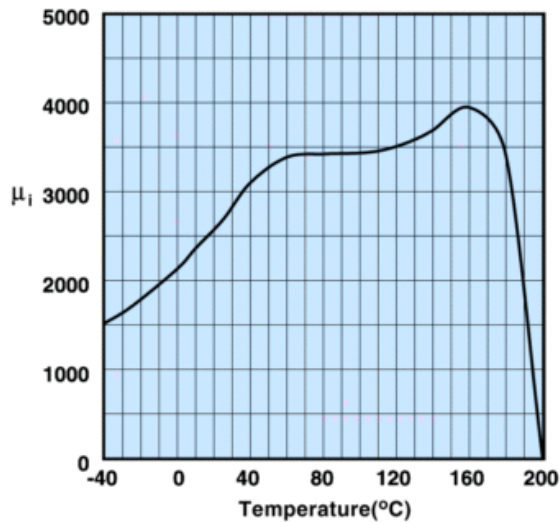
Measured on a 2673000301 bead using the HP 4284A and the HP 4291A.

### Percent of Original Impedance vs. Temperature



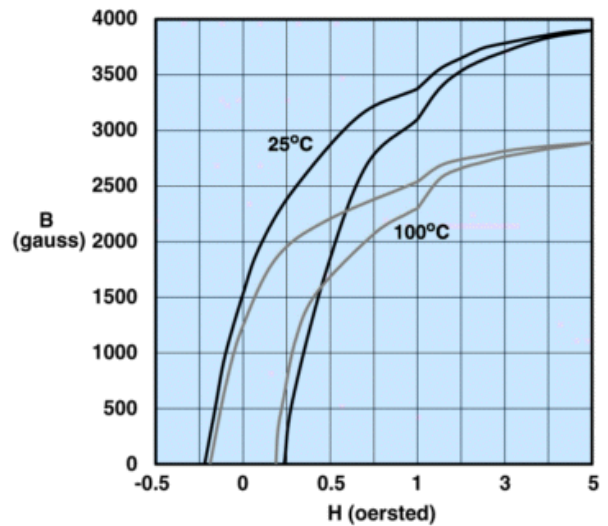
Measured on a 2673000301 using the HP4291A.

### Initial Permeability vs. Temperature



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

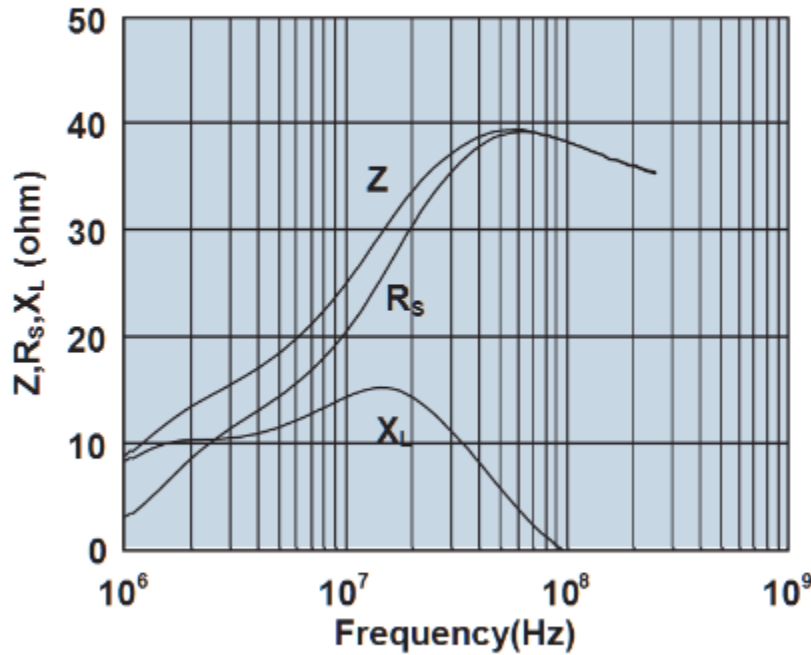
### Hysteresis Loop



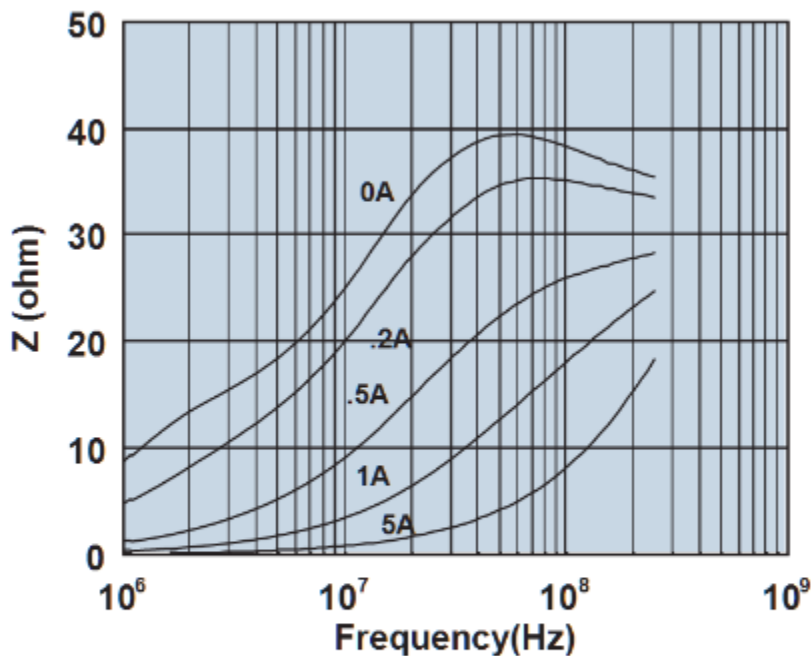
Measured on a 17/10/6mm toroid at 10kHz.



**2773044447**



Impedance, reactance, and resistance vs. frequency.



Impedance vs. frequency with dc bias.