

| | |
|------------------|--|
| 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) |

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 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 °C of the soldering temperature, the parts meet the resistance to soldering requirements of EIA-186-10E, temperature 260±5 °C 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 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 4291A 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, check the component bias curves. The 019/021/037 and 044 SM Beads can withstand a continuous current of 10 amps resulting in a component temperature rise < 40 °C

-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_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 | 3.5 - 4.5 mW/cm - °C |
| Coefficient of Linear Expansion | 8 - 10x10 ⁻⁶ /°C |
| Tensile Strength | 4.9 kgf/mm ² |
| Compressive Strength | 42 kgf/mm ² |
| Young's Modulus | 15x10 ³ kgf/mm ² |
| Hardness (Knoop) | 650 |
| Specific Gravity | ≈ 4.7 g/cm ³ |

The above quoted properties are typical for Fair-Rite MnZn and NiZn ferrites.

See next page for further material specifications.



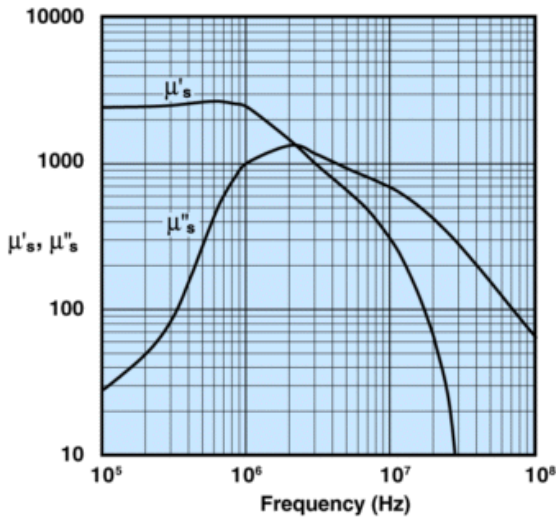
A MnZn ferrite, supplied only in small cores, to suppress conducted EMI frequencies below 50 MHz.

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

73 Material Characteristics:

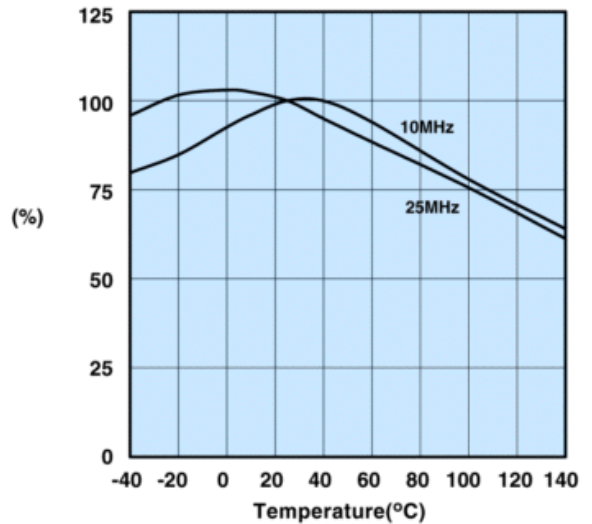
| Property | Unit | Symbol | Value |
|--|------------------|-----------------------|--------------------|
| Initial Permeability @ B < 10 gauss | | μ_i | 2500 |
| Flux Density @ Field Strength | gauss oersted | B H | 3900 5 |
| Residual Flux Density | gauss | B_r | 1500 |
| Coercive Force | oersted | 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 | Ω cm | ρ | 1×10^{-2} |

Complex Permeability vs. Frequency



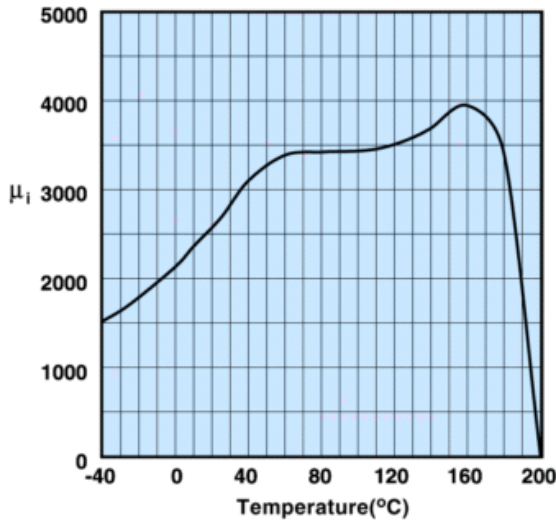
Measured on a 2673000301 bead using the HP 4284A and the HP 4291A.

Percent of Original Impedance vs. Temperature



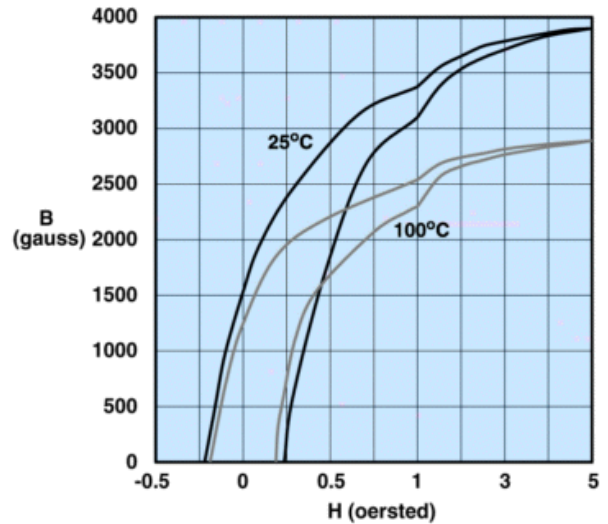
Measured on a 2673000301 using the HP4291A.

Initial Permeability vs. Temperature



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

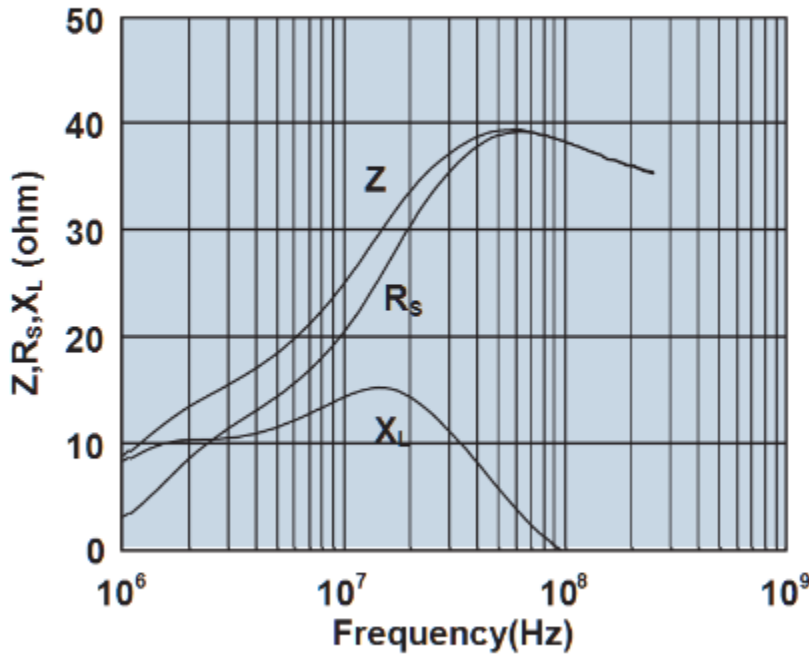
Hysteresis Loop



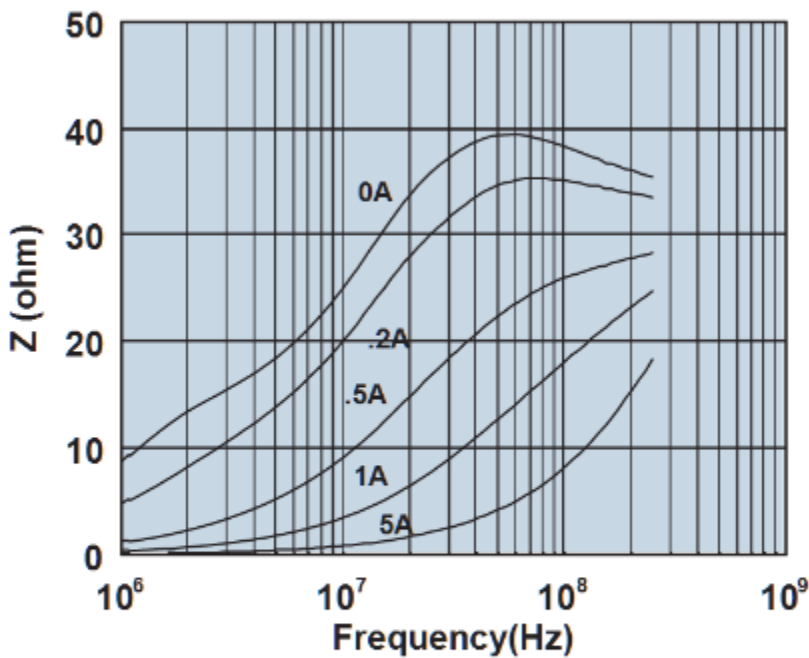
Measured on a 17/10/6mm toroid at 10kHz.



2773044447



Impedance, reactance, and resistance vs. frequency.



Impedance vs. frequency with dc bias.