

Part Number: 3067990851  
Frequency Range: Low Permeability, 67 (ui=40) material  
Description: 67 ROD  
Application: Inductive Components  
Where Used: Open Magnetic Circuit  
Part Type: Antenna/RFID Rods

## Mechanical Specifications

Weight: .230 (g)

## Part Type Information

These rods are designed for use in antenna and RFID transponder applications. Rods are available in three materials to cover a frequency range from 50 kHz to 25 MHz. Suggested frequency ranges: 78 material < 200 kHz, 61 material 0.2 -5.0 MHz and 61 material > 5.0 MHz.

-See [www.fair-rite.com/newfair/catalog\\_rodinfo.htm](http://www.fair-rite.com/newfair/catalog_rodinfo.htm) graphs for temperature information for these rods.

-Rods can be supplied with a Parylene C coating. Parylene coated rods have a '4' as the last digit. Parylene C is RoHS compliant.

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

-The Antenna/RFID Kit (part number 0199000024) contains a selection of these rods.

-Explanation of Part Numbers: Digits 1&2 = product class, 3&4 = material grade, the last digit 1 = uncoated rod and 4 = Parylene coated rod.

## Mechanical Specifications

| Dim | mm    | mm<br>tol | nominal<br>inch | inch<br>misc. |
|-----|-------|-----------|-----------------|---------------|
| A   | 2.00  | ±0.025    | 0.079           | -             |
| B   | -     | -         | -               | -             |
| C   | 15.00 | ±0.45     | 0.591           | -             |
| D   | -     | -         | -               | -             |
| E   | -     | -         | -               | -             |
| F   | -     | -         | -               | -             |
| G   | -     | -         | -               | -             |
| H   | -     | -         | -               | -             |
| J   | -     | -         | -               | -             |
| K   | -     | -         | -               | -             |

## Electrical Specifications

| Typical Impedance ( $\Omega$ ) |         |
|--------------------------------|---------|
|                                |         |
| Electrical Properties          |         |
| $U_{ROD}$                      | 18      |
| $A_e(\text{cm}^2)$             | 0.03140 |

## Land Patterns

| V | W<br>ref | X | Y | Z |
|---|----------|---|---|---|
| - | -        | - | - | - |
| - | -        | - | - | - |

## Winding Information

| Turns  | Wire | 1st Wire | 2nd Wire |
|--------|------|----------|----------|
| Tested | Size | Length   | Length   |
| -      | -    | -        | -        |

## Reel Information

| Tape Width<br>mm | Pitch<br>mm | Parts 7 "<br>Reel | Parts 13 "<br>Reel | Parts 14 "<br>Reel |
|------------------|-------------|-------------------|--------------------|--------------------|
| -                | -           | -                 | -                  | -                  |

## Package Size

| Pkg Size |
|----------|
| -<br>(-) |

## 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.



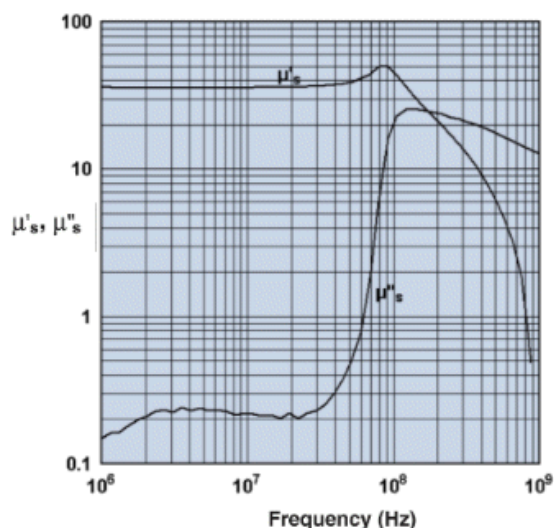
A high frequency NiZn ferrite for the design of broadband transformers, antennas and HF, high Q inductor applications up to 50 MHz. Toroids, multi-aperture cores and antenna/RFID rods are available in this material.

*Strong magnetic fields or excessive mechanical stresses may result in irreversible changes in permeability and losses.*

#### 67 Material Characteristics:

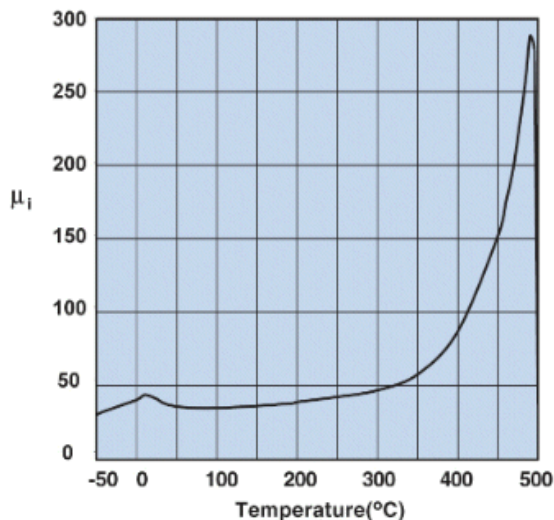
| Property                                                    | Unit             | Symbol                | Value           |
|-------------------------------------------------------------|------------------|-----------------------|-----------------|
| Initial Permeability @ B < 10 gauss                         |                  | $\mu_i$               | 40              |
| Flux Density @ Field Strength                               | gauss<br>oersted | B<br>H                | 2300<br>20      |
| Residual Flux Density                                       | gauss            | $B_r$                 | 800             |
| Coercive Force                                              | oersted          | $H_c$                 | 3.5             |
| Loss Factor @ Frequency                                     | $10^{-6}$<br>MHz | $\tan \delta / \mu_i$ | 150<br>50       |
| Temperature Coefficient of Initial Permeability (20 - 70°C) | %/°C             |                       | 0.05            |
| Curie Temperature                                           | °C               | $T_c$                 | >475            |
| Resistivity                                                 | $\Omega$ cm      | $\rho$                | $1 \times 10^7$ |

#### Complex Permeability vs. Frequency



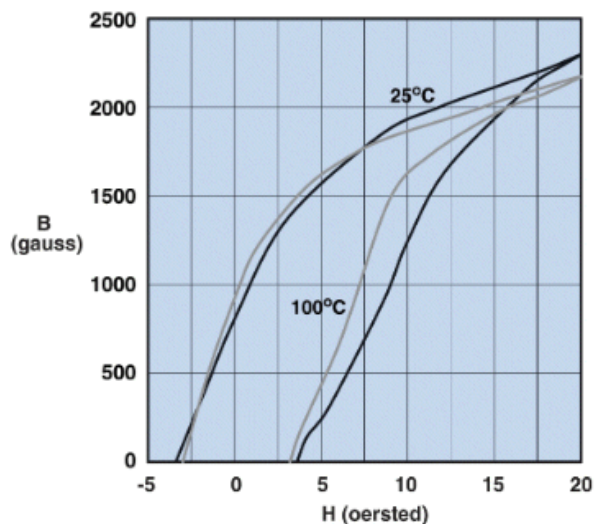
Measured on an 19/10/6mm toroid using the HP 4284A and the HP 4291A.

#### Initial Permeability vs. Temperature



Measured on a 19/10/6mm toroid at 100 kHz.

#### Hysteresis Loop



Measured on a 19/10/6mm toroid at 10 kHz.