

Figure 4

Part Number: 9677142009
 Frequency Range: Power Applications
 Description: 77 BOBBIN 3PC. ASSEMBLY
 Application: Inductive Components
 Where Used: Open Magnetic Circuit
 Part Type: Bobbins

Mechanical Specifications

Weight: 8.500 (g)

Part Type Information

Bobbins are an economical and well-proven core design for many applications where relatively low but stable inductance values are required.

-For higher frequency designs, use small bobbins in 43 material.

-For power applications, bobbins in 77 material are specified for AL and dc bias limits.

-Bobbins in Figures 2-5 can be supplied with a uniform coating of thermo-set plastic coating which can withstand a minimum breakdown of 500Vrms. This coating will change the dimensions a maximum of 0.5mm (.020"). The last digit of the thermo-set plastic coated part is an '8'.

-The listed dimensions are for assembled bobbins without thermo-set plastic.

-Bobbins are tested for AL value at 1kHz < 10 gauss.

-For any bobbin requirement not listed in the catalog, please contact our customer service group for availability and pricing.

-Explanation of Part Numbers: Digits 1&2 = product class, 3&4 = material grade, last digit 8 = coated bobbin.



Mechanical Specifications

| Dim | mm | mm tol | nominal inch | inch misc. |
|-----|-------|-----------|-----------------|---------------|
| A | 14.00 | ±0.35 | 0.551 | - |
| B | 20.00 | ±0.70 | 0.788 | - |
| C | - | - | - | - |
| D | 12.50 | ±0.30 | 0.492 | - |
| E | - | - | - | - |
| F | 9.00 | ±0.30 | 0.354 | - |
| G | 2.00 | ±0.30 | 0.079 | - |
| H | 3.20 | ±0.10 | 0.126 | - |
| J | - | - | - | - |
| K | - | - | - | - |

Electrical Specifications

| Typical Impedance (Ω) | |
|--------------------------------|----------|
| | |
| Electrical Properties | |
| A_L (nH) | 55 ±10% |
| A_L min. @ NI (At) | 47 - 325 |
| N/AWG | 81/28 |
| A_w (cm ²) | .31 |

Land Patterns

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

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 |
| - | - | - | - | - |

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 | 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.

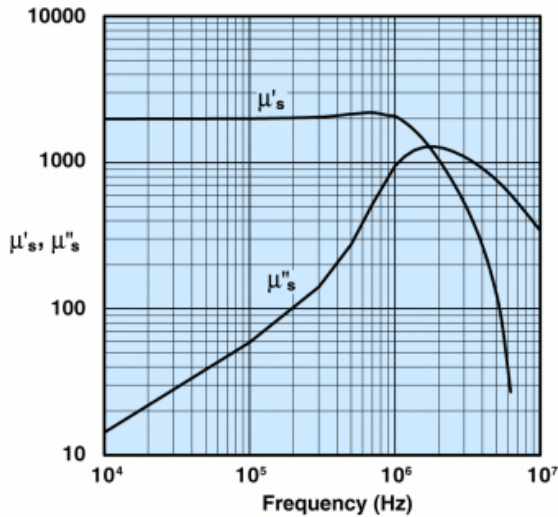
See next page for further material specifications.



77 Material Characteristics:

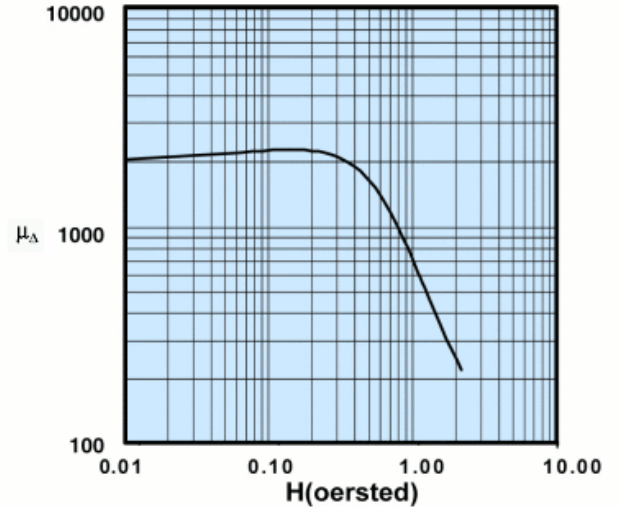
| Property | Unit | Symbol | Value |
|--|------------------|---------------------|-----------------|
| Initial Permeability @ B < 10 gauss | | μ_i | 2000 |
| Flux Density @ Field Strength | gauss oersted | B H | 4900 5 |
| Residual Flux Density | gauss | B_r | 1800 |
| Coercive Force | oersted | H_c | 0.30 |
| Loss Factor @ Frequency | 10^{-6} MHz | $\tan \delta \mu_i$ | 15 0.1 |
| Temperature Coefficient of Initial Permeability (20 -70°C) | %/°C | | 0.7 |
| Curie Temperature | °C | T_c | >200 |
| Resistivity | Ω cm | ρ | 1×10^2 |

Complex Permeability vs. Frequency

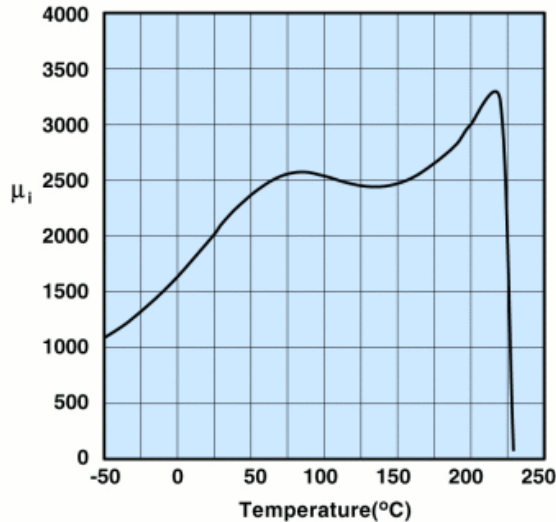


Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

Incremental Permeability vs. H

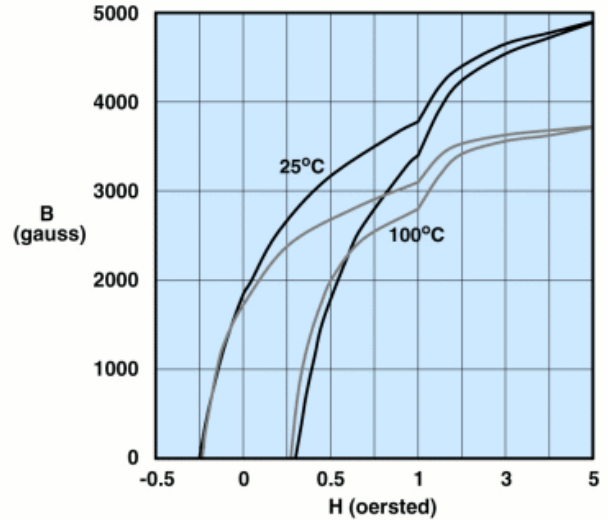


Initial Permeability vs. Temperature



Measured on an 18/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on an 18/10/6mm toroid at 10kHz.



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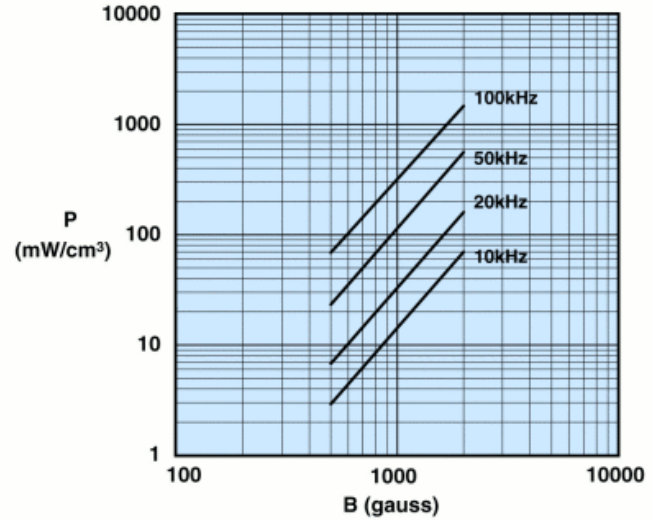


Amplitude Permeability vs. Flux Density



Measured on an 18/10/6mm toroid at 10kHz.

Power Loss Density vs. Flux Density



Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

Power Loss Density vs. Temperature



Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW.

Flux Density vs. Temperature



Measured on an 18/10/6mm toroid at 10kHz and H=5 oersted.