

6 SHIELDING BEADS

Shielding Beads

Ferrite shielding beads offer a convenient, simple and inexpensive solution for obtaining RF attenuation and suppression of undesirable high frequency oscillations without an attendant sacrifice in DC or low-frequency power.

Shielding beads are made in different materials. The material selection is determined by the desired impedance levels at the frequency of interest. As is evident from Figure 1, for frequencies up to 20 MHz, the 3E2A bead will provide more attenuation than an equivalent bead in 3B material. By using more than one bead, the impedance will increase at close to the same ratio as the increase in beads. Combining beads of different materials can lead to improved frequency response. See Figure 3 for a combination of a 3E2A and a 4B bead.

The beads 56 590 65 in 3E2A, 3B, 4A, 4A6 and 4B material can also be supplied on wire, taped and reeled, see page 6-5.

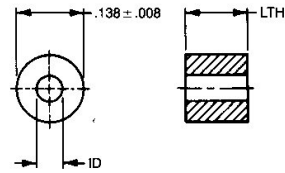


Figure A

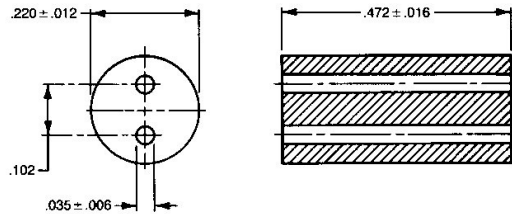


Figure B

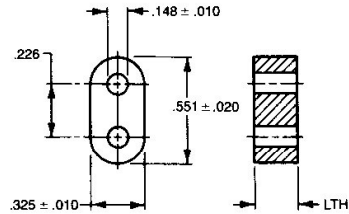


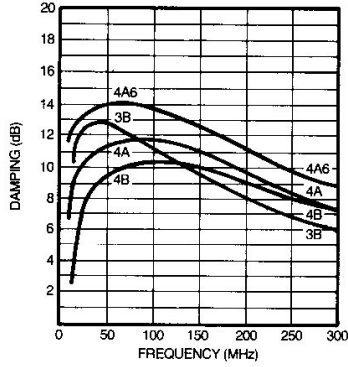
Figure C

Material Characteristics

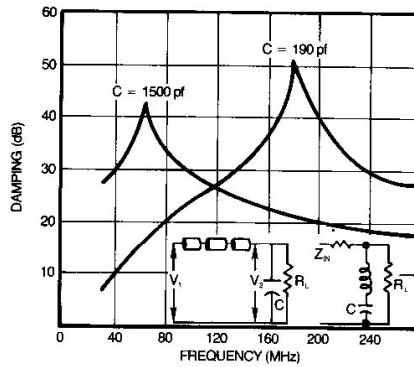
| | 3E2A | 3B | 4A | 4A6 | 4B | 3S1 | 4S2 | 6B1 | |
|--|-------|-------|-------------------|-------------------|-------------------|-------|-------------------|-------------------|-------|
| Initial Permeability (μ_i) | 5000 | 900 | 600 | 1000 | 250 | 4000 | 700 | 250 | |
| Saturation Flux Density (Bs) at H = 10 Oersted, 25°C | 3700 | 3400 | 2900 | 3800 | 3300 | 3600 | 3000 | 3300 | gauss |
| Curie Temperature (Tc) | ≥ 170 | ≥ 150 | ≥ 125 | ≥ 150 | ≥ 250 | ≥ 125 | ≥ 125 | ≥ 250 | °C |
| DC Resistivity | > 10 | > 20 | > 10 ⁵ | > 10 ⁵ | > 10 ⁵ | > 10 | > 10 ⁵ | > 10 ³ | Ω-Cm |

| PART NO. | CORE MATERIAL | ID | LTH | FIG. |
|----------------|---------------|---------------|-------------|------|
| 56 590 65-3E2A | 3E2A | .051 ± .004 | .128 ± .010 | A |
| 56 590 65-3B | 3B | | | |
| 56 590 65-4A | 4A | | | |
| 56 590 65-4A6 | 4A6 | | | |
| 56 590 65-4B | 4B | | | |
| K5 001 00-3B | 3B | .063 ± .004 | .128 ± .010 | A |
| 56 390 31-4B | 4B | See Figure B. | | |
| 280 65-4B | 4B | | .315 ± .012 | C |
| 285 65-4B | 4B | | .551 ± .016 | C |

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Insertion loss in a 60 ohm circuit from a 2.4 inch length of beads.



Typical damping curves for three 56 590 65/3B beads with additional parallel ceramic capacitor.

Typical impedance vs. frequency curves for the 56 590 65 beads.

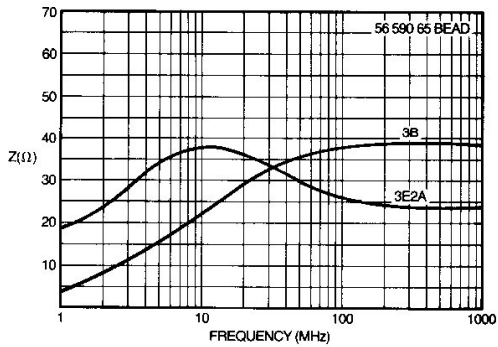


Figure 1

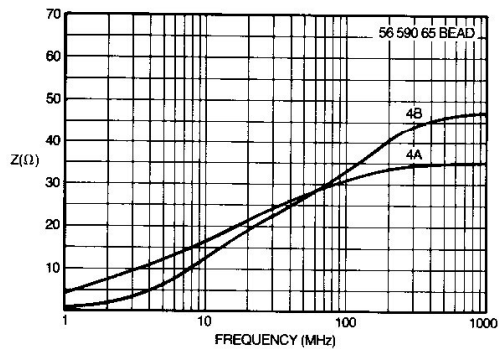


Figure 2

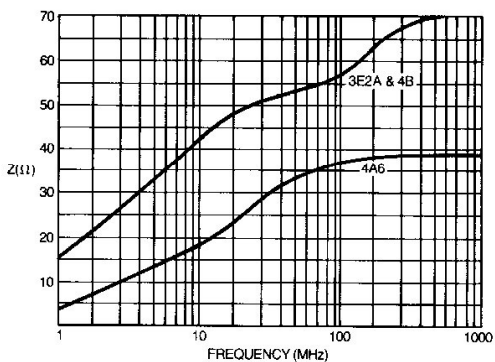


Figure 3