Fair-Rite Products Corp.
Your Signal Solution®

# Rods (4077312911)

Part Number: 4077312911

77 ROD

Explanation of Part Numbers:
– Digits 1 & 2 = Product Class
– Digits 3 & 4 = Material Grade

Pressed Fair-Rite rods are used extensively in high-energy storage designs.

These rods can also be used for inductive components that require temperature stability or have to accommodate large dc bias requirements.

Figure 2 rods have a 0.6 mm (0.024) maximum chamfer on the end faces.

For frequency tuned rod designs see section Antenna/RFID Rods.

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

The A dimension can be centerless ground to tighter tolerances.

Weight: 9.2 (g)

| Dim | mm | mm tol | nominal inch | inch misc. |
|---|---|---|---|---|
| A | 8 | ±0.35 | 0.315 | _ |
| C | 38.1 | ±0.75 | 1.5 | _ |

**Figure 1 shows the rod permeability as a function of the length to diameter ratio for the six materials available in rods.**

**Figures 3, 4 and 5 illustrate typical temperature behavior of wound rods. Would rods in 33 and 77 material yield the best temperature stable inductors, see Figure 4. Both show a typical inductance change of <1% over the -40° to 120°C temperature range. The parts have a L/D ratio of 8.1. Lower ratios will change less. This is shown in detail in Figure 5 for the same 52 material but with the L/D ratio as the parameter. A lower ratio means a lower rod permeability but with improved temperature stability.**

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**Wound Rod Inductance Calculations**

To calculate the inductances of a wound rod the following formula can be used,

**The inductance modifier is found in Figure 2. The ratio winding length divided by the rod length will give the inductance modifier. If the rod is totally wound the K=1. Shorter but centered winding will yield higher K values.**

**Using the rod 3061990871 as an example.**

**For this rod the length over diameter ratio is 8.33 and for 61 material Figure 1 gives a µrod of 29. The rod has an AE= 0.0707 cm² and ?=2.5 cm.**

**A winding of 80 turns of 30 AWG wire will yield a fully wound rod, therefore K=1.**

**Using the formula the calculated inductance is 65.96µH.**

**The measured values for both winding were 66.95 and 39.50µH respectively.**

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