



**ELTEC INSTRUMENTS, INC.**

## **ELTECdata #122**

### **Capacitance of ELTEC Thick Film Resistors**

Eltec resistors have been in production since 1969. They have been especially valued for their low noise performance -- much of which stems from a low shunt capacitance.

What is the capacitance? That's a question we can't answer. There is no universally accepted method for testing the shunt capacitance of high megohm resistors.

Customers have reported resistor capacitances as low as 0.002 picofarads (with standard or 3 lead resistors) and values as high as 0.5 picofarads. One military expert did much testing and reported the capacitance as a "complex function" or "distributed" -- meaning that the value was dependent on the test frequency used.

Military customers who buy our resistors for their low capacitance will not disclose their exact test procedures.

One technique is to use the resistor in the feedback loop of an op amp and then feed frequencies to the circuit until a "knee" appears in the response indicating an RC time constant consisting of resistor value, resistor capacitance, and stray capacitance. Naturally, determining the value of the stray capacitance is difficult at best.

Thus, since Eltec had so many reported values and no standard test procedure to follow, we took the capacitance specification off our data sheet. Therefore, there is no longer a capacitance specification for the product line.

If required, supply of a special resistor with capacitance selected to a set frequency and maximum level using a multi-frequency LCR meter can be quoted upon request. Any information or insights into the problem of measuring miniature high megohm resistor capacitance is welcomed.

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