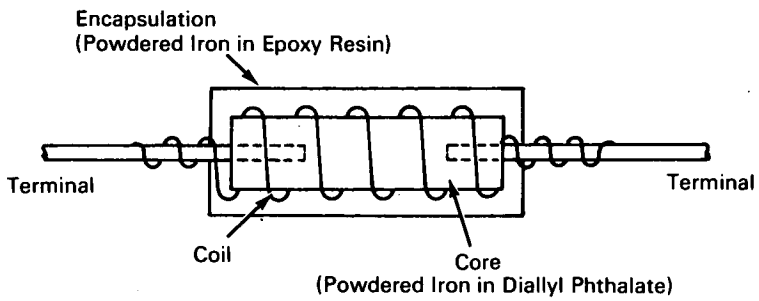
NASA TECH BRIEF

RF Inductor Has High Q, Is Stable at Higher Temperatures



The problem:

To design an encapsulated rf inductor that will have a relatively high Q and remain stable for long periods of time at temperatures up to more than 275°F.

The solution:

An inductor comprising an insulated coil wound on a core consisting of powdered iron in a binder of diallyl phthalate. The core and coil are encapsulated in an epoxy resin filled with powdered iron. Two terminals, projecting from the ends of the core, are soldered to the uninsulated ends of the coil.

Inductors of this design have a Q ranging from 90 to 100, which shows a negligible decrease after the inductors are heated at temperatures up to 275°F for 2000 hours. These inductors should be useful for several hundred hours at temperatures up to 500°F. Conventional inductors (of the same physical size) which typically employ a powdered iron core in a phenolic binder and an encapsulation consisting of an epoxy resin without a magnetic filler have a Q ranging from 55 to 65. The Q of these inductors may decrease by as much as 40 percent after the inductors are subjected to 230°F for 2000 hours.

Notes:

1. Although the Q of the improved inductor can be increased by increasing the proportion of powdered iron in the core, this proportion should not exceed 87 percent by weight to keep the core from becoming too brittle.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Jet Propulsion Laboratory
   4800 Oak Grove Drive
   Pasadena, California 91103
   Reference: B67-10106

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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(JPL-1019)

Category 01