

FETRON NOW

To date, the FETRON has been developed for replacement of pentodes and twin triodes. FETRONs are now available to replace many common tube types such as the 6AK5 and the 12AT7, described in a feature article of *Electronics Magazine*, April 10, 1972. Now in development are replacement types for thyratrons, tetrodes, various high frequency tubes like the 6BA6, and power pentodes such as the 6AQ5 and the 6V6.

The FETRON is not a universal replacement for vacuum tubes, and must be configured differently for certain applications. For example, the FETRON configuration will generally be different for a pentode amplifier and an oscillator. However, the number of replacement tube types and specific applications is growing rapidly, and may one day cover virtually every tube type and application.

The FETRON is currently used mainly in telephone communications systems. Several hundred thousand are now operating in telephone carrier equipment. FETRONs in the field have replaced the 407A, 408A, and similar types. Replacement types are under development for the 403A, 404A,

415A, and 396A tubes. Other replacement types will be developed as requirements are made known by potential users.

INSIDE THE FETRON

The FETRON is composed of one or more JFETs, a protective fuse, and R/C networks for tailoring to the required circuit performance parameters. The JFETs used in the FETRON are also used in high reliability missile systems, and many other applications. These are high volume, proven devices. A tantalum fuse is used, and thick film methods are employed for the R/C networks.

Using standard hybrid circuit techniques, the FETRON elements are assembled under ultra clean conditions. The FETRON elements are then attached to a substrate, after which the substrate is soldered to the header. Using gold wires, the chips and substrate pads are attached to the posts on the header. These posts extend through the header as the socket pins.

A 3/4" nickel-plated cap is cold welded to give the standard semiconductor type hermetic seal. The cap also minimizes device temperature and allows easy plug-in to tube sockets.



Figure 1. A Junction Field Effect Transistor (JFET). One of the JFETs used in the FETRON, and in volume production for high reliability missile systems and many other applications.