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Thyratron Replacement

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Thyratrons in high-power, short-pulse accelerators have a limited lifetime, making it desirable to replace the thyratrons with solid-state devices. One possibility, thyristors, are being developed for this application;, they have not, to date, demonstrated the reliability needed for installation in the short pulse, high peak power RF stations used in many pulsed electron accelerators. An alternate solid-state device, the insulated-gate bipolar transistor (IGBT), readily operates at the speed needed for accelerators, but commercial IGBTs cannot handle the voltage and current required. It is, however, possible to assemble these devices in arrays to reach the required performance levels without sacrificing their inherent speed. Diversified Technologies, Inc. (DTI) has patented and refined the technology required to build these arrays of series-parallel connected switches. Under a DOE contract, DTI is currently developing an affordable, reliable, form-fit-function replacement for the klystron modulator thyratrons at SLAC.

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