

IOT AMPLIFIERS FOR FELS

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Abstract

CPI K2 series IOTs have been operating as RF power sources in particle accelerators for over four years. Among the seven IOTs that are operating for accelerators, two have been providing CW power for over 10,000 hours. The K2 series provides output power up to 80 kW CW, 130 kW peak, in the UHF frequency band. Another IOT class, the K5 series, has been developed and manufactured to address the high-power needs of the scientific accelerator market. The K5's are designed with an integral output cavity, the same technique as used for high-power klystrons. This design eliminates a possible failure caused by arcing in the air filled external output cavity at power levels higher than 80 kW and reduces manufacturing cost. The RF power is coupled out through a coaxial window with optional transition to larger diameter coax or waveguide. The K5 series at this time includes three tube types which are 500 ± 2 MHz, tunable upper UHF band, and 1.3 GHz, respectively. The UHF versions are designed to provide a minimum of 90 kW CW power with greater than 70% efficiency, while the 1.3 GHz IOT is designed to deliver 15 to 30 kW CW with an efficiency of 60%.

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