

Portable Linac using a CW Magnetron as a Power Source, L. BEGIN, E. BLACK, H. DERUYTER, A.V. MISHIN, T. ROUMBANIS, R.G. SCHONBERG, D. SKOWBO, K. VOAK, R. WURSTER, Schonberg Research Corporation, R. MILLER, D. YEREMIAN, SLAC; Y. BATYGIN, RIKEN - This study is devoted to a preliminary design of a high power linear accelerator (linac) for various commercial applications, such as sterilization of medical products, electron beam curing, non-destructive testing and other commercial and scientific applications which require high power electron beams. The main difficulty for use of a CW source for room-temperature linac operation is that the peak power is fairly low, which results in low accelerating field amplitude in the linac microwave structure. This makes it difficult and in some cases impossible to bunch and accelerate particles in the low velocity region. Extensive research made in this field has shown that it is possible to substantially improve a linac operation in the region of low particle velocities (0.1 c to 0.5 c, c-speed of light) and even reduce the injector voltage to 12 kV, in the case of electrons. The design of a 1 MeV, 10 mA machine supersedes the prototype characteristics - patent application is pending. This design makes it possible to meet the desired specification and to be capable of operating in either a CW mode or a long-pulse mode using a 30 kW CW magnetron or another microwave power source.