



Design Study of 455 GHz,1.027 kW Second Harmonic Gyrotron Oscillator

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 The present work, the electron-cyclotron maser (ECM)
 oscillators are high power sources of microwave radiation and
 have applications in fusion plasma heating diagnostics with
 potential for radar and telecommunications systems are
 studied. Electron cyclotron masers are based on the cyclotron
 resonance maser(CRM)instability between a gyrating
 relativistic electron beam moving in a(usually uniform) guide
 magnetic field and electromagnetic radiation, are used. So this
 project deals with the design study of a second harmonic
 gyrotron operating at the mode with 455 GHz output
 frequency.To come across with all these requirements, all
 relevant equations were derived and solved numerically by the
 finite difference technique. A computer code has been fully
 constructed and used to study the design requirements and
 properties of the relativistic electron beam (REB) diode which
 includes the various beam parameters such as: the electron
 energy,beam current,beam guiding radius and pitch
 factor.The expressions for the RF field components were
 derived and their configurations were followed along with
 bunching process generation of the electrons along the cavity
 resonator and presented graphically. 192 pp. Englisch.

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