364
Accession number:20114514506535
Title:Theoretical study on a 0.6 THz third harmonic gyrotron
Authors:Yuan, Xuesong (1); Lan, Ying (2); Ma, Chunyan (1); Han, Yu (1); Yan, Yang (1)
Author affiliation:(1) Terahertz S and T Research Center, University of Electronic Science and Technology of China, Chengdu 610054, China; (2) Chengdu Textile College, Chengdu 611731, China
Corresponding author:Yuan, X.
Source title:Physics of Plasmas
Abbreviated source title:Phys. Plasmas
Volume:18
Issue:10
Issue date:October 2011
Publication year:2011
Article number:103115
Language:English
ISSN:1070664X
CODEN:PHPAEN
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract:A theoretical study on a 0.6 THz third harmonic TE37 mode gyrotron oscillator is reported in this paper in order to develop a compact, reliable, and high power terahertz radiation source. An output power of 4 kW can be generated in the TE37 mode (0.6 THz) at a resonant magnetic field of 7.86 T by the gyrotron oscillator operating at 55 kV2 A with an electron beam radius of 0.32 mm. A magnetron injection gun (MIG) with high compression ratio has been designed. The simulation results of MIG show that the velocity ratio α is 1.37, and the perpendicular velocity spread and parallel velocity spread are 6.1% and 8.9%, respectively.
Number of references:23