508.
Accession number:13090001
Title:The absorption property of single crystal LuBiIG garnet film in terahertz band
Authors:Qing-Hui Yang (1); Huai-Wu Zhang (1); Qi-Ye Wen (1); Ying-Li Liu (1)
Author affiliation:(1) State Key Lab. of Electron. Films & Integrated Devices, Univ. of Electron. Sci. & Technol. of China, Chengdu, China
Source title:Journal of Applied Physics
Abbreviated source title:J. Appl. Phys. (USA)
Volume:111
Issue:7
Publication date:1 April 2012
Pages:07A513 (3 pp.)
Language:English
ISSN:0021-8979
CODEN:JAPIAU
Document type:Journal article (JA)
Publisher:American Institute of Physics
Country of publication:USA
Material Identity Number:DK28-2012-014
Abstract:In this paper, a hypothesis has been brought forward that the materials with low propagation loss in both optical and microwave band may exhibit good performance in terahertz (THz) band because THz wave band interspaces those two wave bands. Several kinds of single crystal garnet films were investigated and we found that the $Lu_{2.1}Bi_{0.9}Fe_5O_{12}$ film which grows by liquid phase epitaxy (LPE) from PbO-free flux has the best absorption properties in both microwave and optical band. In THz range, our hypothesis is well confirmed by a THz-TDS measurement which shows that the absorption coefficient of LuBiIG film is 0.05-0.3 cm^{-1}, and the minimum value appears at 2.24 THz.
Number of references:11
Inspec controlled terms:absorption coefficients - bismuth compounds - garnets - lutetium compounds - magnetic thin films - terahertz wave spectra
Uncontrolled terms:absorption coefficient - terahertz-TDS measurement - PbO-free flux - liquid phase epitaxy - terahertz wave band interspaces - microwave band - optical band - propagation loss - single crystal LuBilG garnet film - absorption property - frequency 2.24 THz - $Lu_{2.1}Bi_{0.9}Fe_5O_{12}$
Inspec classification codes:A7865P Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures) - A7870G Microwave and radiofrequency interactions with condensed matter - A7550G Ferrimagnetics - A7820D Optical constants and parameters (condensed matter)
Numerical data indexing:frequency 2.24E+12 Hz
Treatment:Experimental (EXP)
Discipline:Physics (A)
DOI:10.1063/1.3676421
Database:Inspec