202
Accession number:20121614949449
Title:Dielectric properties of Ba<inf>0.7</inf>Sr<inf>0.3</inf>TiO<inf>3</inf> film at terahertz measured by metamaterials
Authors:Qi, Peng (1); Fan, Yuancheng (2); Li, Hongqiang (2); Zhang, Qiwei (1); Zhai, Jiwei (1)
Author affiliation:(1) Functional Materials Research Laboratory, Tongji University, Shanghai 200092, China; (2) Department of Physics, Tongji University, Shanghai 200092, China
Corresponding author:Zhai, J.(apzhai@tongji.edu.cn)
Source title:Journal of the American Ceramic Society
Abbreviated source title:J Am Ceram Soc
Volume:95
Issue:4
Issue date:April 2012
Publication year:2012
Pages:1167-1169
Language:English
ISSN:00027820
E-ISSN:15512916
CODEN:JACTAW
Document type:Journal article (JA)
Publisher:Blackwell Publishing Inc., 350 Main Street, Malden, MA 02148, United States
Abstract:A metamaterial device with resonance frequency at THz was reported in this article. The device was composed of split-ring resonators (SRR), ferroelectric Ba<inf>0.7</inf>Sr<inf>0.3</inf>TiO<inf>3</inf> (BST70) film, and alumina substrates. The SRR of 140 nm thick Au/Ti was fabricated on BST70 film with periodicity of 50 μm, width of 10 μm, and gap of 8 μm. The BST70 thin film was deposited on alumina substrates using a sol-gel technique. Terahertz time domain spectroscopy was used to characterize electromagnetic response of the metamaterial at various temperatures. Finite difference time domain was used to simulate the transmission spectra of the metamaterial at THz frequencies. Dielectric constant of the BST70 film at THz, in the temperature range from 0°C to 100°C, was derived by comparing the simulated resonance frequency with the experimental curves. © 2012 The American Ceramic Society.
Number of references:15
Main heading:Metamaterials
Controlled terms:Alumina - Dielectric properties - Finite difference time domain method - Natural frequencies - Sol-gels
Uncontrolled terms:Alumina substrates - Electromagnetic response - Experimental curves - Finite difference time domains - Metamaterial devices - Resonance frequencies - Simulated resonance - Sol-gel technique - Splitring resonators - Temperature range - Tera Hertz - Terahertz time domain spectroscopy - THz frequencies - TiO - Transmission spectrums
Classification code:701 Electricity and Magnetism - 711.1 Electromagnetic Waves in Different Media - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 921 Mathematics - 951 Materials Science
DOI:10.1111/j.1551-2916.2012.05072.x