

160

Accession number:20114714540116

Title:Terahertz dielectric response of ferroelectric $Ba_xSr_{1-x}TiO_3$ thin films

Authors:Kang, Seung Beom (1); Kwak, Min Hwan (1); Choi, Muhan (1); Kim, Sungil (1); Kim, Taeyong (1); Cha, Eun Jong (2); Kang, Kwang Yong (1)

Author affiliation:(1) IT Convergence and Components Laboratory, Electronics and Telecommunications Research Institute, Daejeon, Korea, Republic of; (2) Department of Biomedical Engineering, School of Medicine, Chungbuk National University, Chungbuk, Korea, Republic of

Corresponding author:Kang, S.B.(sbkang71@etri.re.kr)

Source title:IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control

Abbreviated source title:IEEE Trans Ultrason Ferroelectr Freq Control

Volume:58

Issue:11

Issue date:November 2011

Publication year:2011

Pages:2276-2280

Article number:6071045

Language:English

ISSN:08853010

CODEN:ITUCER

Document type:Journal article (JA)

Publisher:Institute of Electrical and Electronics Engineers Inc., 445 Hoes Lane / P.O. Box 1331, Piscataway, NJ 08855-1331, United States

Abstract:Terahertz time-domain spectroscopy has been used to investigate the dielectric and optical properties of ferroelectric $Ba_xSr_{1-x}TiO_3$ thin films for nominal x-values of 0.4, 0.6, and 0.8 in the frequency range of 0.3 to 2.5 THz. The ferroelectric thin films were deposited at approximately 700 nm thickness on [001] MgO substrate by pulsed laser deposition. The measured complex dielectric and optical constants were compared with the Cole-Cole relaxation model. The results show that the Cole-Cole relaxation model fits well with the data throughout the frequency range and the dielectric relaxation behavior of ferroelectric $Ba_xSr_{1-x}TiO_3$ thin films varies with the films compositions. Among the compositions of $Ba_xSr_{1-x}TiO_3$ films with different Ba/Sr ratios, $Ba_{0.6}Sr_{0.4}TiO_3$ has the highest dielectric constants and the shortest dielectric relaxation time.

Number of references:20