38
Accession number:20122915253445
Title:Extremely high extinction ratio terahertz broadband polarizer using bilayer subwavelength metal wire-grid structure
Authors:Deng, L.Y. (1); Teng, J.H. (2); Zhang, L. (1); Wu, Q.Y. (2); Liu, H. (2); Zhang, X.H. (2); Chua, S.J. (1)
Author affiliation:(1) Department of Electrical and Computer Engineering, National University of Singapore, Singapore 117576, Singapore; (2) Institute of Materials Research and Engineering, Agency for Science, Technology and Research (ASTAR), Singapore 117602, Singapore
Corresponding author:Deng, L.Y.
Source title:Applied Physics Letters
Abbreviated source title:Appl Phys Lett
Volume:101
Issue:1
Issue date:July 2, 2012
Publication year:2012
Article number:011101
Language:English
ISSN:00036951
CODEN:APPLAB
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract:We report a broadband terahertz (THz) polarizer exhibiting extremely high polarization extinction ratio and the method to fabricate it. The polarizer consists of a bilayer subwavelength Au wire-grid structure fabricated on Si substrate by one step etching and metal formation. The THz time domain spectroscopy (THz-TDS) measurement reveals an extremely high extinction ratio of 84.9 dB at 1.67 THz, close to the detection limit of THz-TDS system, and an average extinction ratio of 69.9 dB in 0.6-3 THz frequency range. The fabricated bilayer wire-grid polarizer shows greatly enhanced performance over conventional single layer wire-grid THz polarizer. © 2012 American Institute of Physics.
Number of references:22
Main heading:Optical instruments
Controlled terms:Laser pulses - Light extinction - Wire
Uncontrolled terms:Bi-layer - Broadband terahertz - Detection limits - Extinction ratios - Polarization extinction ratio - Si substrates - Single layer - Sub-wavelength - Tera Hertz - THz frequencies - THz time domain spectroscopy - THz-TDS - Wire grid polarizers
Classification code:535.2 Metal Forming - 741.1 Light/Optics - 741.3 Optical Devices and Systems - 744.1 Lasers, General
DOI:10.1063/1.4729826
Database:Compendex