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Accession number:20115114605863
Title:A dual-mode terahertz filter based on a metallic resonator design
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Source title:Journal of Infrared, Millimeter, and Terahertz Waves
Abbreviated source title:J. Infrared. Millim. Terahertz Waves
Volume:32
Issue:11
Issue date:November 2011
Publication year:2011
Pages:1299-1306
Language:English
ISSN:18666892
E-ISSN:18666906
Document type:Journal article (JA)
Publisher:Springer New York, 233 Springer Street, New York, NY 10013-1578, United States
Abstract:We present a metallic resonator fabricated on silicon capable of dual-mode operation at terahertz frequencies. The resonator exhibits a notch plus stop band filter response or a notch filter response depending on the orientation of the incident electric field with respect to the structure. The former results in two resonance features: one at 0.69 THz with a Q-factor of 3.7 and the other at 0.91 THz. The latter results in a resonance feature at 0.63 THz with a Q-factor of 5.7. Using 3D finite-difference time-domain simulations, the resonator is designed to operate between 0.1 and 1.4 THz. Experimental verification is performed using a free space terahertz time-domain spectroscopy system, and agreement with our simulations is realized.
Number of references:14