358. Title:Broadband terahertz imaging with highly sensitive silicon CMOS detectors
Authors:Schuster, Franz (1); Coquillat, Dominique (2); Videlier, Hadley (2); Sakowicz, MacIej (2); Teppe, Frédéric (2); Dussopt, Laurent (1); Giffard, Benoît (1); Skotnicki, Thomas (3); Knap, Wojciech (2)
Source title:Optics Express
Volume:19
Issue:8
Issue date:April 11, 2011
Publication year:2011
Pages:7827-7832
Language:English
Document type:Journal article (JA)
Abstract:This paper investigates terahertz detectors fabricated in a low- cost 130 nm silicon CMOS technology. We show that the detectors consisting of a nMOS field effect transistor as rectifying element and an integrated bow-tie coupling antenna achieve a record responsivity above 5 kV/W and a noise equivalent power below 10 pW/Hz0 5in the important atmospheric window around 300 GHz and at room temperature. We demonstrate furthermore that the same detectors are efficient for imaging in a very wide frequency range from ∼0. 27 THz up to 1. 05 THz. These results pave the way towards high sensitivity focal plane arrays in silicon for terahertz imaging.