445
Accession number: WOS:000305426300011
Title:Terahertz detector with transmission-line type superconducting tunnel junctions
Authors:Ariyoshi, S. (1); Takahashi, K. (2); Noguchi, T. (3); Kurakado, M. (4); Koga, K. (2); Furukawa, N. (2); Otani, C. (2)
Author affiliation:(1) Nagoya Inst Technol, Showa Ku, Nagoya, Aichi 4668555, Japan; (2) RIKEN, Terahertz Wave Res Grp, Wako, Saitama 3510198, Japan; (3) Natl Inst Nat Sci, Natl Astron Observ Japan, Mitaka, Tokyo 1818588, Japan; (4) Techno X Co Ltd, Higashiyodogawa Ku, Osaka 5330033, Japan
Source title:SUPERCONDUCTOR SCIENCE & TECHNOLOGY
Abbreviated source title:SUPERCOND SCI TECH
Volume:25
Issue:7
Issue date:JUL 2012
Pages:075011
Language:English
ISSN:0953-2048
Document type:Article
Publisher:IOP PUBLISHING LTD, TEMPLE CIRCUS, TEMPLE WAY, BRISTOL BS1 6BE, ENGLAND
Abstract:We demonstrate a new type of terahertz detector with superconducting tunnel junctions. The detector has two long junctions integrated on both wings of a log-periodic antenna. In this type of detector, the long junction is a lossy transmission line working based on the Cooper-pair breaking, as well as a standing-wave resonance line working based on the photon-assisted tunneling. A prototype detector using Nb/Al/AlOx/Al/Nb junctions was fabricated, and the principle of the detector was verified. The prototype shows a gradual increase in sensitivity starting from 0.35 THz. We have also identified a resonance signal at 0.25 THz below the effective gap frequency.
Number of references:17
Main heading:Physics
DOI:10.1088/0953-2048/25/7/075011