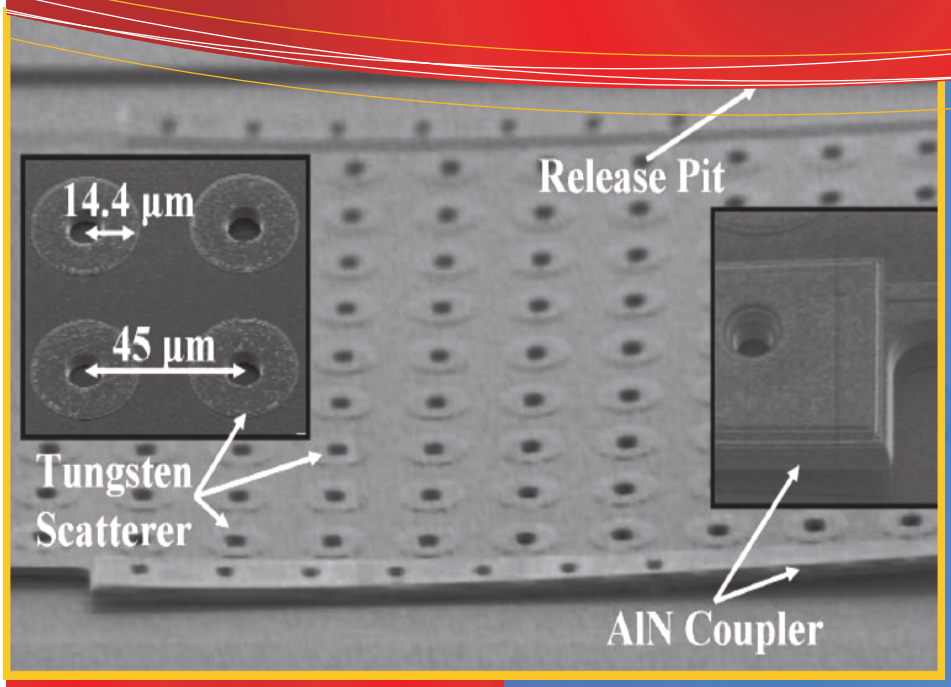
Sandia National Laboratories

SAND2011-2830P

RF Acoustic Bandgap Materials



SEM image of a 67 MHz acoustic bandgap device.

Acoustic micro-resonator radio frequency (RF) filters are used in nearly all wireless devices including 4G mobile networks, and cell phone radios.

Sandia-developed acoustic band gap (ABG) materials use arrays of micro-scale scatterers to block acoustic waves, offering Improved isolation of RF acoustic filters for higher packaging density (smaller footprint) with reduced crosstalk.

Sandia researchers used advanced modeling and microfabrication to dramatically scale down the size of ABG devices, while enabling wafer-scale manufacture. This new class of commercially-relevant ABG materials has submicron features and frequencies in excess of 1 GHz, in bands of interest for wireless communication.

ABG materials also open the door to advancements in thermal management by controlling the acoustic vibrations that transmit heat.

POTENTIAL MARKETS AND APPLICATIONS

- RF acoustic filter isolation
- Radio-on-a-chip
- Multi-band wireless devices
- Micro-scale thermal management devices

BENEFITS

- Provides isolation for RF resonators/filters
- Vacuum compatible
- Acoustically isolated from substrate
- CMOS-compatible

TECHNOLOGY READINESS LEVEL

Sandia estimates this technology is at TRL 3/9: concepts demonstrated analytically and experimentally.

INTELLECTUAL PROPERTY

US PATENT # 7,836,566
US PATENT # 7,733,198

TECHNICAL LEAD

Ihab El-kady | ielkady@sandia.gov

LICENSING CONTACT

Dan Allen | dgallen@sandia.gov

HTTPS://IP.SANDIA.GOV

National Nuclear Security Administration

Sandia National Laboratories

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration.
SAND # 2011-xxxx