



Berkeley Sensor & Actuator Center (BSAC)




Berkeley Sensor & Actuator Center

Prof. Albert P. Pisano

Berkeley Micromechanical Analysis and Design (BMAD) Laboratory
Harsh Environment and Telemetry Systems (HEaTS)



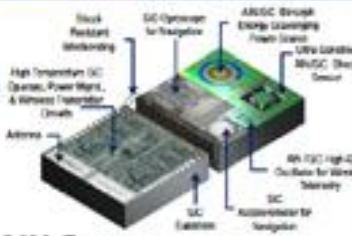
Research Lead



Graduate Student Researchers

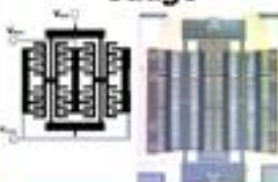
Sensors

MEMS integration

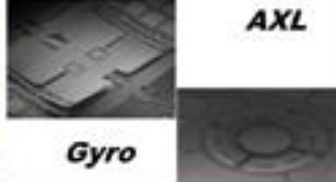


SIC -AlN Sensors

Resonant Strain Gauge



AlN Inertial sensors



AXL


Gyro

Harsh Environments

Subsurface & Combustion

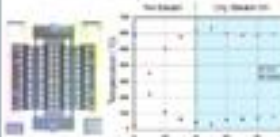
Energy Industries	Geothermal	Oil & Gas Exploration	Industrial Gas Turbines	Automotive Engines	Aircraft Engines
	374°C	275°C	600°C	300°C	600°C
Operating Temperature					
Operating Measurements	Pressure, Temperature, H ₂ S, Strain	Pressure, Temperature, Hydrocarbon Strain	Pressure, Temperature, Flame Speed, Acceleration	Pressure, Temperature, Flame Speed, O ₂	Pressure, Temperature, Flame Speed, Acceleration

64000 g Exposure (Shock!)

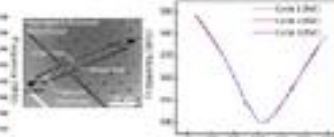


High Temperature

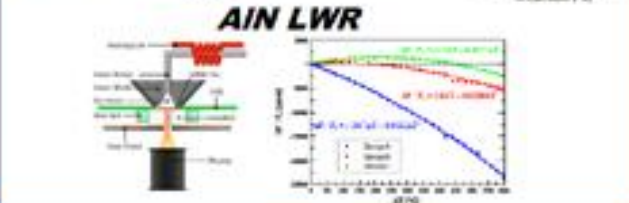
SiC DETF



AlN DETF




AlN LWR



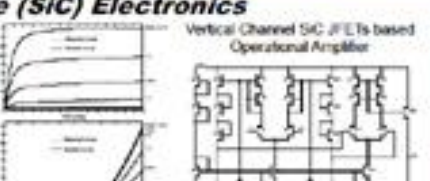
SiC ICs & RF Resonators

Silicon Carbide (SiC) Electronics

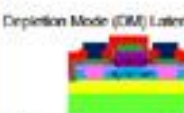
Vertical Channel Complementary SiC JFETs




Vertical Channel SiC JFETs based Operational Amplifier



Depletion Mode (DM) Lateral SiC JFETs

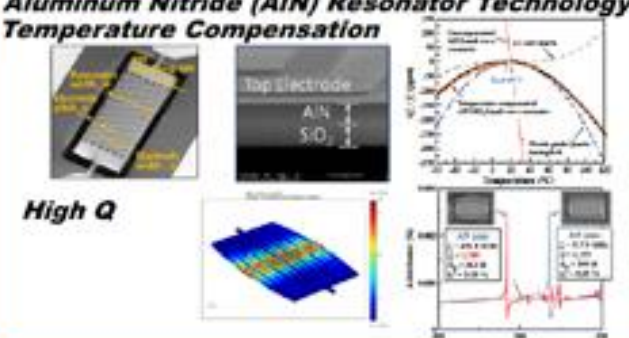


Lateral SiC NPN & PNP BJTs



Aluminum Nitride (AlN) Resonator Technology

Temperature Compensation



High Q

Fabrication & Materials

SiC on top of AlN



AlN etch



<http://bmad.eecs.berkeley.edu/>

© 2012 University of California Berkeley Sensor & Actuator Center

