

MEMS Based High Dose Radiation Resistant SOI Pressure Sensor for Aerospace Applications

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Transducers used in nuclear propulsion systems and space applications must withstand high-dose radiation environments along with high temperature operation. However, performance characteristics of various conventional silicon sensors are degraded at high temperature environments, and also show substantial radiation damage due to ionization in silicon. In this paper, a MEMS based high-dose radiation resistant SOI pressure sensor with integrated microheaters to maintain constant temperature for artificial satellites is developed, and its suitability for operation under high-dose radiation environment is reported. The developed sensor has inbuilt microheater arrangement for constant temperature operation. SOI pressure sensors were subjected to a radiation dosage level up to 100 krad, and performance characteristics such as linearity, offset and sensitivity were evaluated.

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