GEORGE MASON UNIVERSITY

PRECISION NANOFLUID SENSOR

GMU-24-011

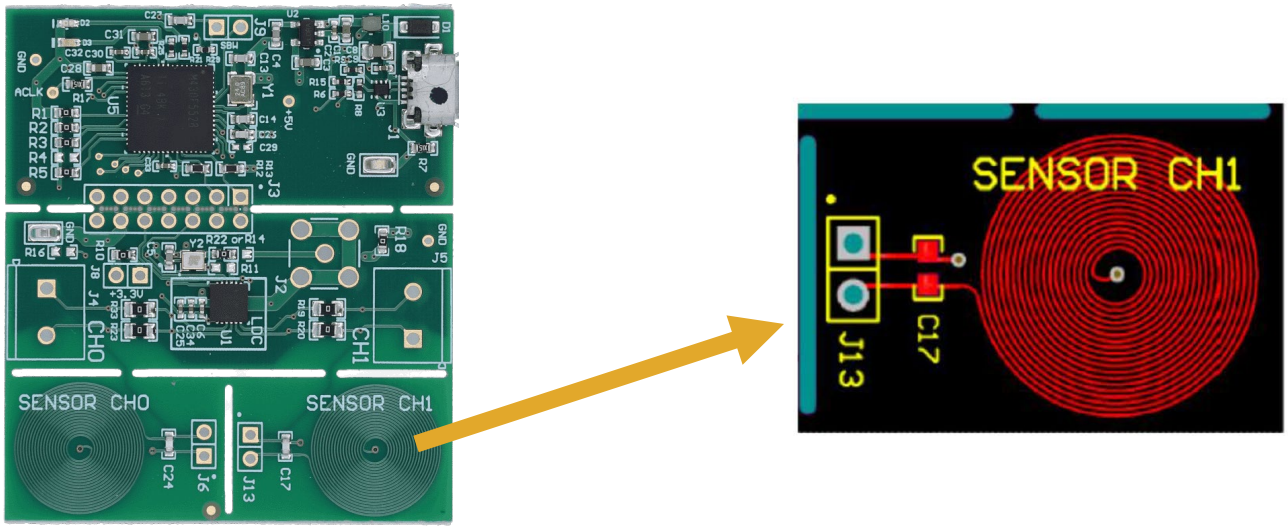
UNLOCKING THE INVISIBLE WITH UNMATCHED SENSITIVITY AND PRECISION

This prototyped chemical sensor technology is an advanced inductance sensor system that detects and analyzes nanofluids. The sensor uses a high-resolution inductance-to-digital converter (LDC) that measures subtle changes in self-inductance. This provides highly sensitive, non-invasive chemical sensing for various nanoparticles, making it ideal for research and industrial applications.

Key Features

- **High Sensitivity:** Capable of detecting minor changes in inductance with precision down to the pico-Henry (pH) level, ensuring accurate and reliable measurements
- **Versatile Detection:** Effectively measures the inductance of various nanofluids, including those with diamond, rutile, magnetite, and gold nanoparticles, each exhibiting unique electrical and magnetic properties
- **Non-Invasive:** Real-time data acquisition without sample alteration
- **Broad Applicability:** Suitable for detecting metallic, non-metallic, and semi-metallic nanoparticles, expanding its utility across different scientific and industrial domains
- **Validated Accuracy:** Experimental results confirmed by finite element simulations with less than 1% error
- **Low Signal Detection Limits:** The technology is engineered to detect extremely low concentrations of nanoparticles, making it ideal for applications where sensitivity is paramount.

This cutting-edge inductance sensor is ideal for precise and reliable nanofluid analysis, offering a new frontier in chemical sensing and material characterization.



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