

PYROELECTRIC MEMS INFRARED SENSOR WITH NUMEROUS WAVELENGTH ABSORPTIONS

Tech ID: 23723 / UC Case 2013-051-0

PATENT STATUS

Country	Type	Number	Dated	Case
Japan	Issued Patent	6549119	07/05/2019	2013-051
United States Of America	Issued Patent	9,335,217	05/10/2016	2013-051

BRIEF DESCRIPTION

In recent years, gas sensors for industrial applications have experienced great advances through rapid evolution of microelectromechanical systems (MEMS). As a result of increased government legislative pressure on industrial health and safety, commercial customers are demanding integrated smart sensor technology and systems which leverage MEMS for small footprint, low cost, and high-performance features. Market researchers suggest double-digit compound annual growth rates for MEMS sensors through 2018, with the fastest growth is expected in the semiconductor sensor base. Traditional infrared gas analyzers determine the absorption of an emitted infrared light source through a certain air sample. Nondispersive infrared technology (NDIR) detects certain gas by detecting the absorption of infrared wavelengths that is characteristic of that gas. NDIR detectors are the industry standard method of measuring the concentration of carbon oxides. Researchers at UC Berkeley and Davis have successfully demonstrated pyroelectric infrared detectors that exhibit high sensitivity and reliable performance for advanced gas analyses. The MEMS technology is well suited for constant monitoring in harsh environments where long term stability is important, such as petroleum, medical, and industrial monitoring settings.

SUGGESTED USES

- » Nondispersive infrared sensing
- » Indoor CO2 monitoring
- » Environmental monitoring
- » Heating, ventilation, and air conditioning (HVAC)
- » Breath analyzers
- » Greenhouse gas monitoring
- » Freon detection
- » Flame analysis
- » Thermal detection devices

ADVANTAGES

- » 20% less in volume and 50% less in thickness than current designs
- » High sensitivity and reliable performance in extreme environments
- » Leverages industry standard platforms and low-cost parts

RELATED MATERIALS

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INVENTORS

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OTHER INFORMATION

KEYWORDS

pyroelectric, MEMS,
microelectromechanical, NDIR, gas,
sensor, detector, carbon oxides, CO,
CO2, thermopile, bolometers,
nondispersive infrared

CATEGORIZED AS

- » **Environment**
- » Sensing
- » **Semiconductors**
- » Design and Fabrication
- » **Sensors & Instrumentation**
- » Environmental Sensors
- » Process Control

RELATED CASES

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