

CAMBRIDGE
CMOS
SENSORS



Company Overview

05 February 2014

www.ccmoss.com

Cambridge CMOS Sensors

Established in 2008

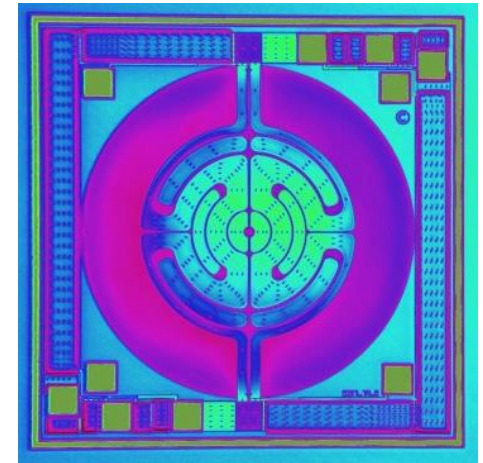
Spin-out from Cambridge University

Strong Patent portfolio in CMOS MEMS
Micro-hotplates and sensors for high
volume applications

Fabless Semiconductor business model

Key Product Focus:

- Micro-Hotplates for resistive gas sensing applications
- Broadband Infrared Sources for a range of infrared based sensors
- High Performance Infrared detectors



Sensor Applications

Non-Dispersive Infrared Sensors (NDIR)

- CCS Broadband IR Sources enable detection of a wide range of gases
- Optical IR sensing using gas absorption

Resistive Gas Sensors

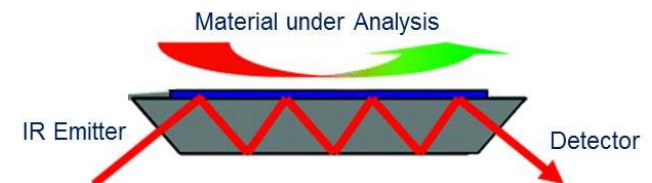
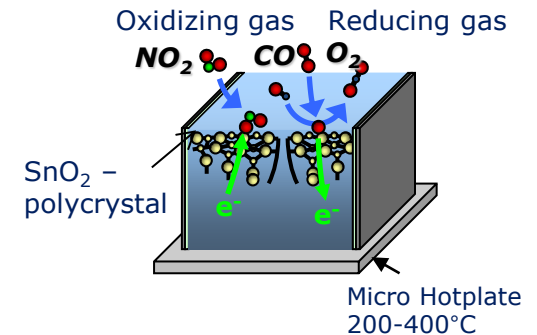
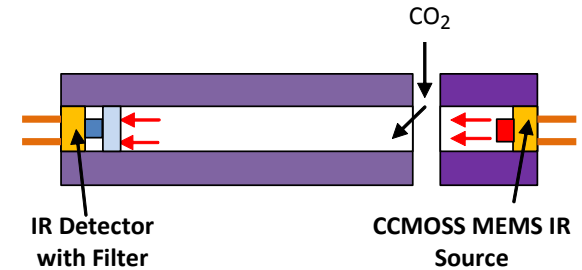
- Enabling single or multi-gas sensing with CCS Micro Hotplate single die, or die arrays
- Detection of gases through catalytic reactions on sensor surface causing resistance changes

Attenuated Total Reflectance (ATR) Sensors

- CCS IR Sources enable Miniature sensors for detection & analysis of gels, liquids, solids (powder)

Miniature proximity sensors

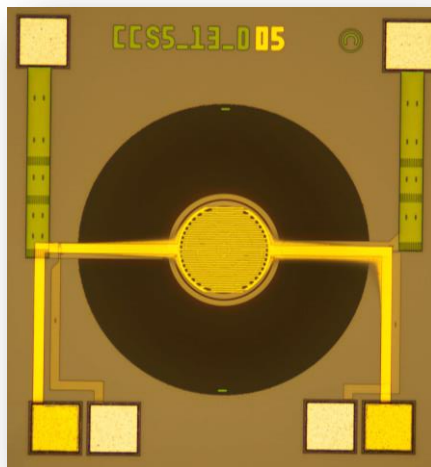
- CCS Mid-IR Sources & Detector arrays enabling Motion detection & Gesture control



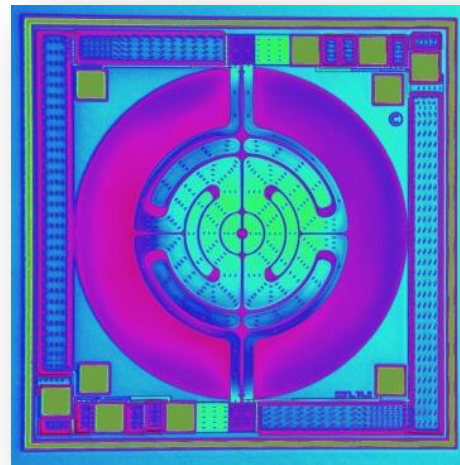
Products & Applications

**Resistive Gas
Sensing**

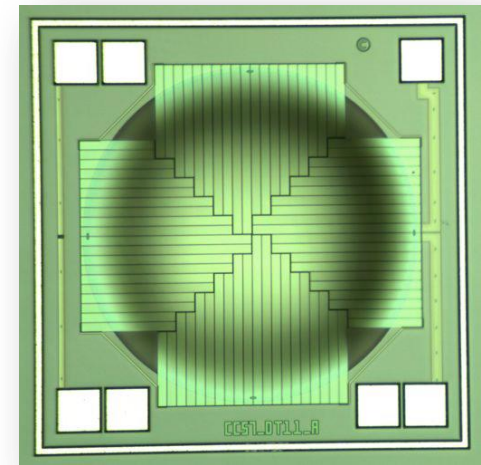
Infrared Sensors
Gas & Materials sensing
Proximity, Gesture, IR Imaging



Micro-Hotplate



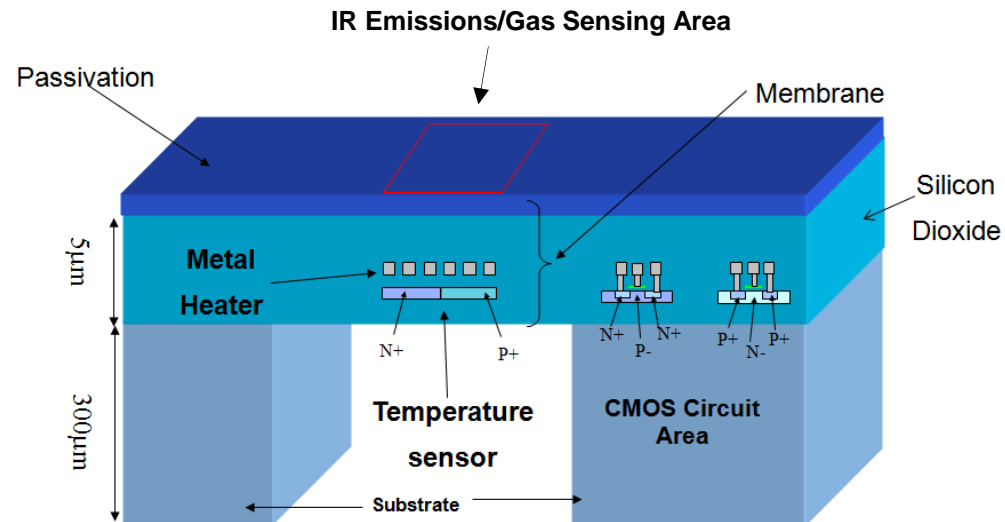
Infrared Emitter



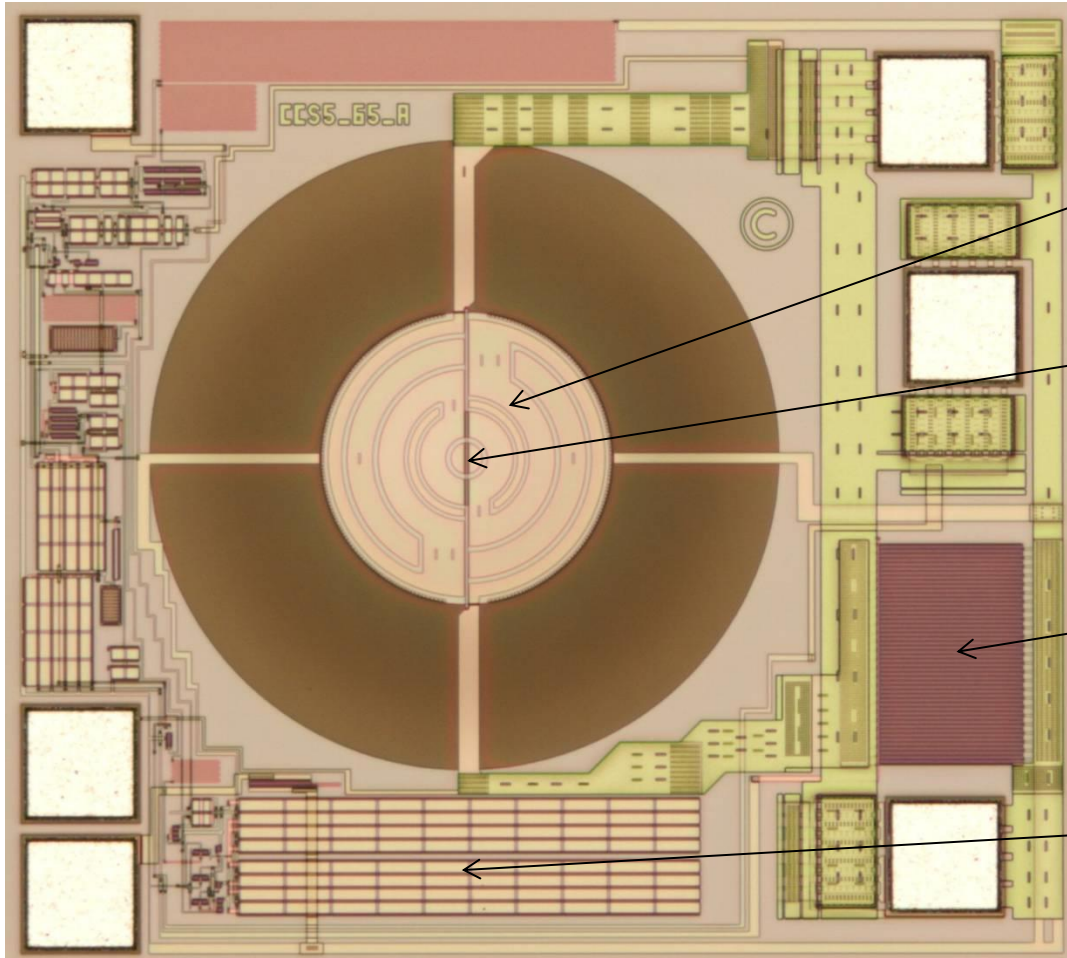
Thermopile Detector

Benefits of our Technology

- Ultra-low power consumption – **μW average for gas analysis**
- Fast thermal transient response – **20ms thermal transitions to max temp**
- Cost-effective and high volume manufacturing
- Miniaturised system **100 μm diameter hotplates**
- Broadband IR Emissions – longer wavelength IR applications
- Improved reliability and stability
- On-chip integration of drive and signal processing electronics for a "system-on-a-chip" solution



Top view of 'SMART' CMOS Micro-hotplate



Heating Element

Diode temperature sensor

MOSFET driver

CMOS feedback control for constant temperature

Markets Focus

Consumer

- Smartphone Ambient Air Quality Monitoring
- Gesture-based Interfacing, Zero Touch Technologies
- Personal Sports monitoring



Medical/ Home Healthcare

- Personalised healthcare monitoring
- Breath Analysis for diagnosis



Automotive

- In-Vehicle AlcoLocks for alcohol detection
- In-Vehicle Air Quality
- Emissions Testing & Monitoring

Domestic & Industrial Security

- Refrigerant leak detection
- Fire Detection
- Ambient Air Quality Monitoring

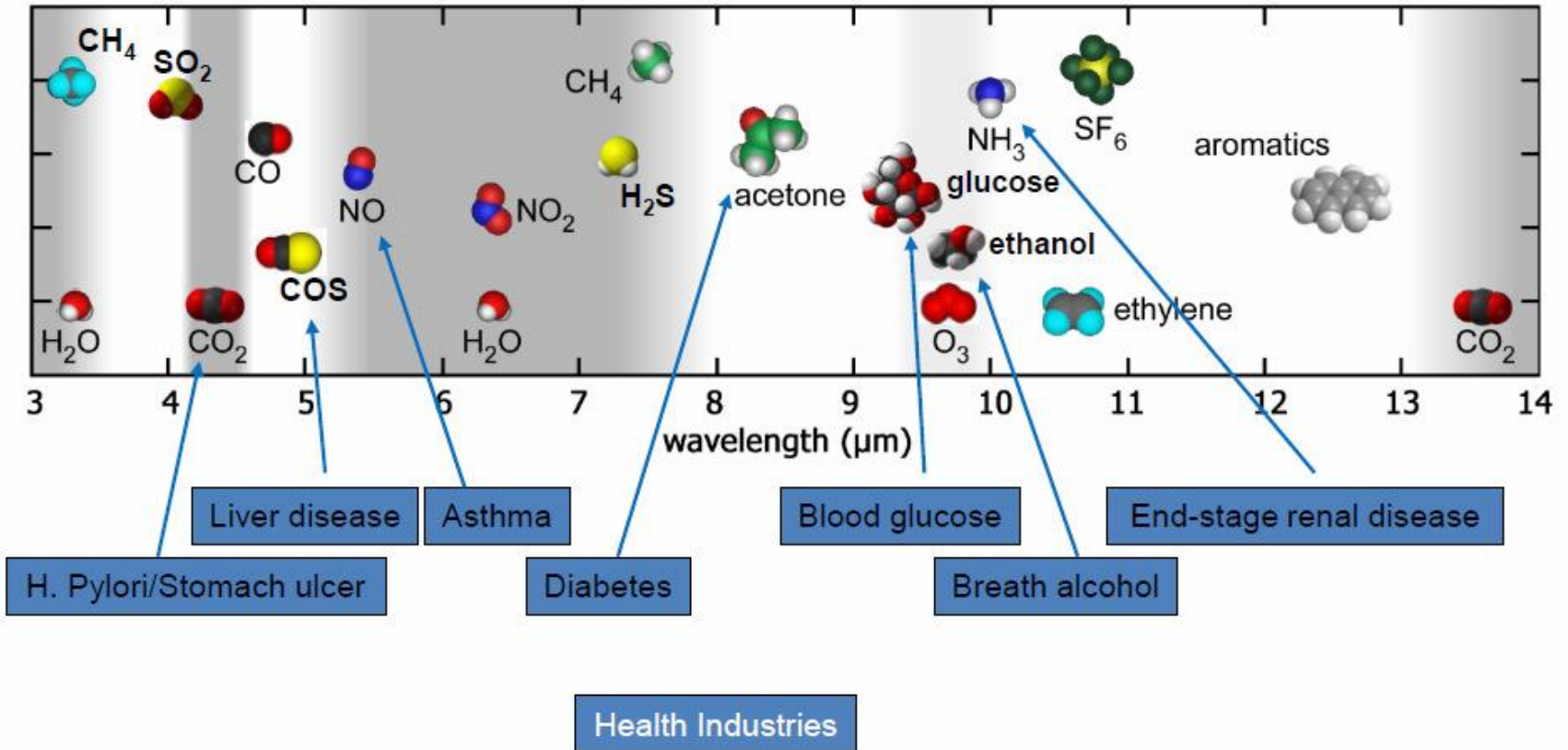


CCMOSS technology enables Air Quality monitoring through miniature multi-sensing devices

- Wide range of gases
- Suitable sensitivity for level indicators/warnings
- Cost effective, high volume solution
- Miniature form factor
- Ultra-low power for negligible battery life impact
- Long lifetime & reliability



Infrared Detection in Healthcare



Summary

The next generation of ultra-low power, miniature sensing solutions

- μ W average power consumption for negligible battery life impact
- Class leading Infrared and Resistive Gas sensors and components
- Miniature form factor
- Proven, reliable sensor technology
- Highly cost-effective
- High stability & long lifetime