

Hotplate-based Conductometric Monolithic CMOS Gas Sensor System

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Abstract

A single-chip conductometric gas sensor system fabricated in industrial CMOS-technology with post-CMOS micromachining is presented, which comprises a tin dioxide-covered microhotplate, a digital temperature controller ($200\text{-}350^{\circ}\text{C} \pm 2^{\circ}\text{C}$), a logarithmic converter for the tin dioxide resistor and a serial interface. All necessary driving circuitry and A/D conversion units were realized on chip. The chip communication is handled with an I2C digital standard interface. Gas tests evidenced a detection limit below 1ppm for carbon monoxide.