MICS-EK1 Datasheet
Metal Oxide Semiconductor Gas Sensor Evaluation Kit

Getting started quickly with SGX Metal Oxide Semiconductor Gas Sensors

Simply attach the universal power supply, connect to a PC USB port and plug in one or two gas sensors. The SGX data logging and control software allows the performance of different sensors to be assessed and makes it easy to capture performance data.

INTRODUCTION

The SGX MICS-EK1 Gas Sensor Evaluation Kit will drive the SGX range of Metal Oxide Semiconductor gas sensors and automatically measure the sensor resistance as it changes with applied gas.

Sensors can be driven manually or automatically by sending simple commands through the USB interface to an on-board microcontroller. A comprehensive set of commands is provided for use with a terminal program such as HyperTerminal. Alternatively an easy-to-use control and data logging PC application is provided on CD which gives full functionality in a few mouse-clicks.

Surface mount adapter boards are also available with the kit and can be ordered separately. One adapter PCB will plug in to both sockets and can be fitted with either a single or dual surface mount gas sensor.

The heaters can be set to two levels. These are nominally preset to 43 mW and 76 mW by plug-in resistors but may be changed by the user to other values. The microprocessor monitors the sensor output resistance with automatic resistance range switching.

An expansion connector provides access to four configurable alarms (open collector), two analog outputs and four digital inputs. LEDs on the board mimic the status of each alarm. A JTAG header allows advanced users to upload their own software to the microcontroller (MSP430F2616) and make full use of the available interfaces.

A universal mains adapter is also supplied or the user may connect a 9 V power supply to the terminal block connector.

FEATURES

- For use with SGX Metal Oxide Semiconductor Gas Sensors
- Automatic measuring of sensor resistance changes
- Operates one 10-pin surface mount sensor (single or dual) with additional adapter PCB
- USB interface to a Personal Computer (PC)
- Free PC application software for easy control and data logging
- Settable heater drive levels
- Automatic load resistor switching
- Four configurable alarm outputs
- Two configurable analog outputs
- Four digital inputs
- Ambient temperature monitoring
- Provision for humidity sensor (customer fit)
- Expansion header for additional applications
- JTAG header for user software upload
- Supplied with universal mains adapter
- Supplied with user manual on CD
**ELECTRICAL DATA**

**Universal Mains Adapter**
- Input voltage: 90 - 264 V ac
- Input frequency: 50 – 60 Hz
- Adapters supplied: UK, Europe, USA, Australia
- Output: 9 V dc

**PCB Interfaces**

**DC Supply Input**
- SK4: 2.1 x 5.5 mm socket, centre positive terminal block
- Input voltage: 9 V ± 10%
- Input protection: Over-voltage and current, reverse voltage

**Gas Sensor Sockets**
- SK1: Channel 1: 4-pin TO5
- SK2: Channel 2: 4-pin TO5

The adapter PCB is plugged into SK1 and SK2 to allow a single or dual surface mount sensor to be used.

**Expansion Connector**
- PL2: 2 x 10-pin 0.1” PCB header
  - 3V3 regulated: 9 V unregulated
  - 0 V: Output 1 (Open collector)
  - Input 1 (3V3 logic): Output 2 (Open collector)
  - Input 2 (3V3 logic): Output 3 (Open collector)
  - Input 3 (3V3 logic): Output 4 (Open collector)
  - Input 4 (3V3 logic):
    - 0V: Analog out 1 (0 - 2.048 V)
    - 0V: Analog out 2 (0 - 2.048 V)
  - Spare RXD (3V3):
    - 0V: Spare TXD (3V3)
    - 0V: Spare

**JTAG Connector**
- PL1: 2 x 7-pin 0.1” box header
  - TDO: VCCO
  - TDI: VCCI
  - TMS: Unused
  - TCK: Unused
  - 0 V: Unused
  - TRST: Unused
  - Unused: Unused

**Microcontroller Reset**
- SW2: Push-button

**Indicators**
- D1 – D4: Green LEDs (ON = alarm asserted)
- D5: Green LED (flash = PCB functional)

**Control Switch**
- SW1 1-4: Control of heater modes and humidity sensing (see manual)

**Heater Control Resistors**
- RA, RB: High/low power – channel 1
- RC, RD: High/low power – channel 2

**USB**
- SK5: Mini-USB type B

**MECHANICAL DATA**

**Dimensions**
- Mains adapter: 72 x 45 x 29 mm
- Evaluation kit PCB: 130 x 55 mm
- SMD adapter PCB: 25 x 10 mm

**ENVIRONMENTAL DATA**

**Operating Temperature Range**
- Mains adapter: Operating temperature: 0 to +40 °C
- Storage temperature: -25 to +85 °C
- Operating humidity: 10 to 90%

**PCBs**
- Designed for operation and storage from -40 to +85 °C

**Sensors**
- See individual sensor data sheets

**PERFORMANCE DATA**

**ADC resolution**
- 12-bit

**DAC resolution**
- 12-bit

**Resistance measurement**
- ≤2% (75R to 6.5M)
- ≤5% (30R to 20M)

**Resistance measurement**
- <1% (output given to 4 significant digits)

**Temp measurement**
- ±2 °C (at 25 °C)

**RECOMMENDED PC SYSTEM**

**For Control and Data Logging Software**
- Processor: Pentium 4/M or equivalent
- Operating system: Windows XP or Vista
- Screen resolution: 1024 x 768 pixels
- RAM: 1 GB
- Disk space: 1.6 GB

**ORDERING INFORMATION**

**MICS-EK1**

MICS Gas Sensor Evaluation Kit Contents:
- Evaluation PCB
- Universal Mains Adapter
- USB lead
- CD Containing Data Logging Software and User Manual
- 5 x SMD Adaptor PCB’s (also available separately)

**MICS-SMD-PCB5**

MICS Surface Mount Adapter Kit Contents:
- 5 x SMD Adapter PCB’s

**Note:** The above kits do not include sensors. These must be ordered separately.