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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.
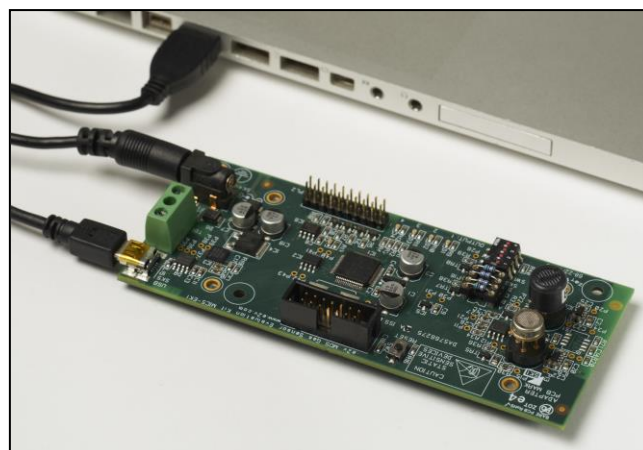
Gas sensors to be ordered separately

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
TB1	terminal block
Input voltage	9 V $\pm$ 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	1	2	9 V unregulated
0 V	3	4	0 V
Input 1 (3V3 logic)	5	6	Output 1 (Open collector)
Input 2 (3V3 logic)	7	8	Output 2 (Open collector)
Input 3 (3V3 logic)	9	10	Output 3 (Open collector)
Input 4 (3V3 logic)	11	12	Output 4 (Open collector)
0V	13	14	Analog out 1 (0 - 2.048 V)
0V	15	16	Analog out 2 (0 - 2.048 V)
Spare RXD (3V3)	17	18	Spare TXD (3V3)
0V	19	20	Spare

JTAG Connector

PL1   2 x 7-pin 0.1" box header

TDO	1	2	VCCO
TDI	3	4	VCCI
TMS	5	6	Unused
TCK	7	8	Unused
0 V	9	10	Unused
TRST	11	12	Unused
Unused	13	14	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 accuracy (25 °C)	≤2% (75R to 6.5M) ≤5% (30R to 20M)
Resistance measurement resolution (25 °C)	<1% (output given to 4 significant digits)
Temp measurement accuracy	$\pm$2 °C (at 25 °C) $\pm$3 °C (-25 to +85 °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.

Mouser Electronics

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