

Sample board for USB DEVELOPPER KIT



- Sample boards supporting several pressure modules including:
 - MS45xx family (on request only)
 - MS5536
 - MS5540 / 5541
 - MS5561
 - MS5607 / 5611
 - MS5637
 - MS5803
 - MS5805
 - MS5806
- 2 connectors on board:
 - USB Demo kit interface connector
 - 16 pins header user interface connector

DESCRIPTION

The MS5xxx-BRD is a sample board family which may be plugged into the “MEAS USB DEVEL KEY” tool. It currently supports all our sensors family like the MS45xx, MS55xx, MS56xx and MS58xx. Communication protocols 3wires/SPI and I2c are available on dedicated sample boards. All Samples Boards have a USBDEVEL KEY connector and also a standard 2x8 pins connector for user applications.

GENERAL BOARD DESCRIPTION



Figure 1 Top side view on Sample Board



Figure 2 Bottom side view on Sample Board

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GENERAL BOARD SCHEMATIC DESCRIPTION

The "PCB for SAMPLES BOARDS" is done to be connected to the USB DEVEL KEY and also to a Header of 2x8 pin for customer use. We have SAMPLES BOARDS for all our products with dedicated communication bus.

SCHEMATIC FOR I2C BUS:



SCHEMATIC FOR SPI BUS:



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BOARD PICTURES

Samples board with sensors



MS5536



MS5701
(replaced by MS45xx)



MS45xx



MS5561



MS5607/MS5611



MS5637



MS5540/MS5541



MS5803



MS5805



MS5806

Samples board for interfaces



Internal connection

RECOMMENDED OPERATION CONDITIONS

Please refer to the sensor datasheet for all information.

Note: The total error is calculated to sum the different accuracy:

Total error = “Absolute accuracy”+”Maximum error with supply voltage”+”Long-term stability”

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HEADER 16 PINS INTERFACE PINOUT

The board also contains a complete 2.54 mm 2x8 PINOUT interface for signal monitoring or connection to a custom development board with a flat cable.

| • Pin Name | • Pin | • Type | • Function |
|-----------------------|-------|--------|--|
| User interface | | | |
| PEN | 2 | I | Programming enable (1) |
| PV/CS | 4 | I | Negative programming voltage (1) / Chip Select |
| VDD | 6 | P | Positive supply voltage 3 volts from USB module* |
| MCLK/PS | 8 | I | Master clock (32.768 kHz) / Protocol select |
| SDI | 10 | I | Serial data input |
| SDO | 12 | O | Serial data output |
| SCLK | 14 | I | Serial data clock |
| GND | 16 | G | Ground |

NOTE

- 1) Pin 4 (PV) and PIN 2 (PEN) are only used by the manufacturer for MS55xx test and should not be connected.

| • Pin Name | • Pin | • Type | • Function |
|-----------------------|-------|--------|--|
| User interface | | | |
| GND | 1 | G | Ground |
| NRESET | 3 | I | Do not connect |
| MOSI | 4 | I/O | Do not connect |
| MISO | 7 | I/O | Do not connect |
| SCK | 9 | O | Do not connect |
| VDD | 11 | P | Positive supply voltage 3 volts from USB module* |
| VDD | 13 | P | Positive supply voltage 3 volts from USB module* |
| VDD | 15 | P | Positive supply voltage 3 volts from USB module* |

Table 3: 2.54 mm 2x8 connector PINOUT

(*) Only if USB DEVL KEY is connected

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EDGE CONNECTOR PINOUT

The edge connector bottom side contains all the connections required for the different sensors using either the I2C, SPI or 3 wires protocol with the USB DEVEL KEY.

| • Pin Name | • Pin | • Type | • Function |
|--|-------|--------|--|
| User interface | | | |
| GND | 2 | G | Ground |
| PV/CSB | 4 | N | Negative programming voltage (2) / Chip Select |
| MCLK/PS | 6 | I | Master clock (32.768 kHz) / Protocol select |
| DIN/SDI/SDA | 8 | I | Serial data input |
| SDO/-DOUT | 10 | O | Serial data output |
| SCLK/SCL | 12 | I | Serial data clock |
| VDD | 14 | P | Positive supply voltage 3 volts from USB module |
| Manufacturer reserved interface | | | |
| GND | 1 | G | Ground |
| PEN | 3 | I | Programming enable (2) |
| NRESET | 5 | I | Reset input active low for microcontroller |
| MOSI | 7 | O/I | SPI output of microcontroller / external programming pin |
| MISO | 9 | I/O | SPI Input of microcontroller / external programming pin |
| SCK | 11 | O | SPI of microcontroller clock |
| VDD | 13 | P | Positive supply voltage 3 volts from USB module |

Table 4: USB DEVEL KEY connector PINOUT

NOTE

- Pin 3 (PV) and PIN 4 (PEN) are only used by the manufacturer for MS55xx test and should not be connected.

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MOUNTING AND ASSEMBLY CONSIDERATIONS

SOLDERING

Please refer to the application note AN808 & AN809 available on our website for all soldering issues.

MOUNTING

The sensors can be placed with automatic Pick & Place equipment using vacuum nozzles. They will not be damaged by the vacuum. Due to the low stress assembly the sensor does not show pressure hysteresis effects. It is important to solder all contact pads.

CONNECTION TO PCB

The package outline of the module allows the use of a flexible PCB for interconnection. This can be important for applications in watches and other special devices.

SEALING WITH O-RINGS

In products like outdoor watches the electronics must be protected against direct water or humidity. For those products the metal ring provides the possibility to seal with an O-ring. The metal ring is made of special anticorrosive stainless steel with a polished surface. In addition to this the ring is filled with silicone gel covering the sensor and the bonding wires. The O-ring (or O-rings) shall be placed at the outer diameter of the metal cap. This method avoids mechanical stress because the sensor can move in vertical direction.

CLEANING

MEAS sensors have been manufactured under clean room conditions. It is therefore recommended to assemble the sensor under class 10'000 or better conditions. Should this not be possible, it is recommended to protect the sensor opening during assembly from entering particles and dust. To avoid cleaning of the PCB, solder paste of type "no-clean" shall be used. Cleaning might damage the sensor!

ESD PRECAUTIONS

The electrical contact pads are protected against ESD up to 2 kV HBM (human body model). It is therefore essential to ground machines and personnel properly during assembly and handling of the device. MEAS Sensors are shipped in antistatic transport boxes. Any test adapters or production transport boxes used during the assembly of the sensor shall be of an equivalent antistatic material.

DECOUPLING CAPACITOR

Particular care must be taken when connecting the device to the power supply. A 100nF ceramic capacitor or a 47µF ceramic capacitor for the MS55xx series is implemented on the PCB. This capacitor will stabilize the power supply during data conversion and thus, provide the highest possible accuracy.

PULL-UP RESISTORS

Two pull up resistors are implemented on the PCB compatible with I2c bus. These resistors don't affect the use with the SPI bus.

Sample board for USB DEVELOPPER KIT

ORDERING INFORMATION

| Product | Part Number / Art. Number |
|-------------------------------|---------------------------|
| Samples board MS5536-60CPJU | PROTO-5536-60-BRD |
| Samples board MS5536-CNJU | PROTO-5536-CN-BRD |
| Samples board MS5540-CM | PROTO-5540-CM-BRD |
| Samples board MS5541-14BA-CM | PROTO-5541-14-BRD |
| Samples board MS5541-30BA-CM | PROTO-5541-30-BRD |
| Samples board MS5561-C | PROTO-5561-C-BRD |
| Samples board MS5607-02BA03 | PROTO-5607-02-BRD |
| Samples board MS5611-01BA03 | PROTO-5611-01-BRD |
| Samples board MS5637-02BA03 | PROTO-5637-02-BRD |
| Samples board MS5803-01BA01 | PROTO-5803-01-BRD |
| Samples board MS5803-02BA01 | PROTO-5803-02-BRD |
| Samples board MS5803-05BA01 | PROTO-5803-05-BRD |
| Samples board MS5803-14BA01 | PROTO-5803-14-BRD |
| Samples board MS5803-30BA01 | PROTO-5803-30-BRD |
| Samples board MS5805-02BA01 | PROTO-5805-02-BRD |
| Samples board MS5806-02BA52 | PROTO-5806-02-BRD |
| | |
| Samples board MS45xx | On request only |
| | |
| PCB DEVEL Internal Connection | PROTO-PCBDEVELBRD |
| USB DEVELOPMENT KIT | PROTO-USBDEVELKIT |

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