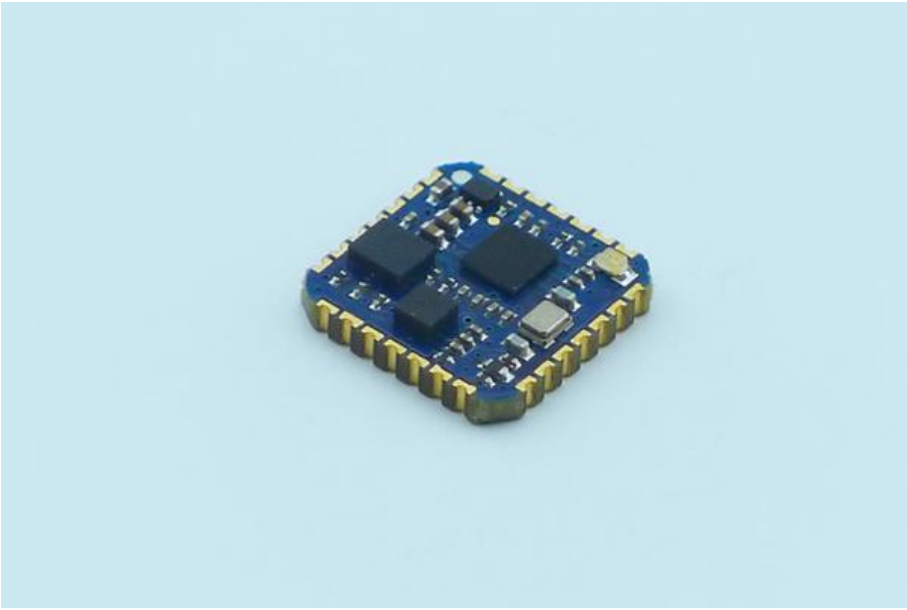
# LPMS-ME1
# Hardware Manual ver. 2.1



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## Revisions

| Date | Version | Changes |
|---|---|---|
| 2020-09-14 | ver. 2.1 | ● Adjust sensor performance parameters and modify MODE pin description error. |
| 2019-11-06 | ver. 2.0 | ● creation of this separated hardware manual from user manual.<br>● correction of SPI information. |
| 2017-10-02 | ver. 1.12 | ● to change the file name of this document from Datasheet to Manual |
| 2017-08-08 | ver. 1.11 | ● to add “Command Lists” to Appendix |
| 2017-05-25 | ver. 1.10 | ● to add declaration of SPI interface reserved<br>● to add example of “Magnetometer Calibration”<br>● Correction of some typos |
| 2016-10-21 | ver. 1.9 | ● LPMS-ME1 package updated |
| 2016-09-06 | ver. 1.8 | ● to add example of “Set UART Baud Rate” |
| 2016-08-31 | ver. 1.7 | ● to add chapter of “Coordinate System” |
| 2016-08-30 | ver. 1.6 | ● Correction on types and units of transmitted data<br>● to add chapter of “Communication Modes”<br>● to add communication examples |
| 2016-08-29 | ver. 1.5 | ● to add definitions of logic high and low levels<br>● to add descriptions of pin 15 and 25<br>● to add “Power Consumption” on Specifications |
| 2016-08-25 | ver. 1.4 | ● I2C registers information updated<br>● to add more detailed information about data transmission |
| 2016-08-18 | ver. 1.3 | ● to add introductions about default UART baud rate<br>● to add introductions about data types in different transmittal modes |
| 2016-08-16 | ver. 1.2 | ● I2C registers updated<br>● LPMS-ME1 package updated |
| 2016-07-18 | ver. 1.1 | ● Initial release |

# Table of Conents

# 1. Introduction

The LPMS-ME1 is a low cost, high performance inertial measurement unit (IMU) with 9 axis. It integrates multiple sensors including 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer. And after the correction and calculation through the unique algorithm of our company, it can provide precise data including Euler angles, quaternion and linear acceleration. In the meanwhile, the size of LPMS-ME1 is very small, which means it is easy to assemble, convenient for you to embed it in your system and good for your design and development.

**Key Features:**

- MEMS miniature inertial measurement unit (IMU)
- Integration of 3-axis gyroscope, accelerometer and magnetometer in one unit
- Real-time, on-device calculation of sensor orientation and linear acceleration
- Power Supply: 3.3~5.5V
- Interfaces: UART, I2C, SPI
- Size: PLCC-28 (12.0x12.0x2.6mm)

**Applications:**

- Human motion capture
- Internet of Things (IOT) devices
- Sports performance evaluation
- Drone fight control

# 2. General Information

## 2.1 Block Diagram

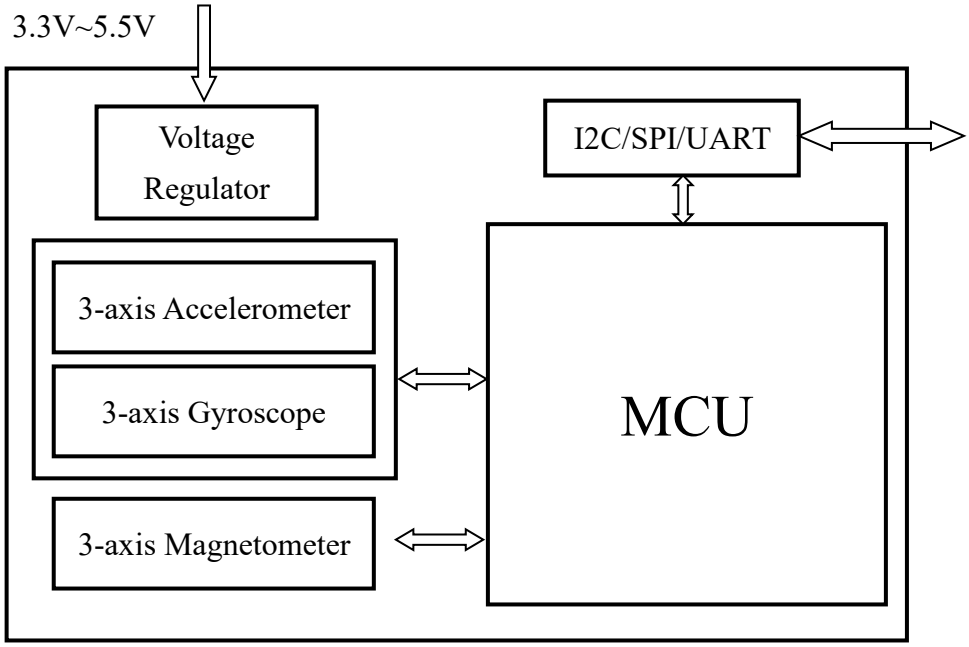


Fig. 2.1. Block diagram of LPMS-ME1

## 2.2 Pin out

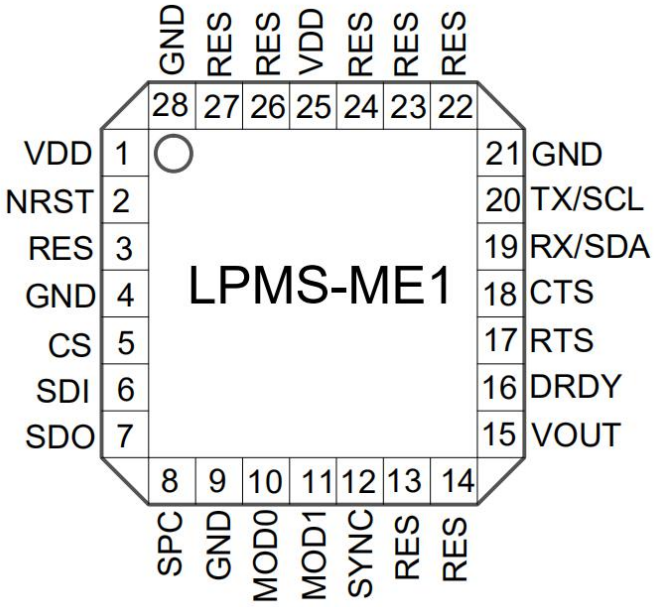


Fig. 2.2. Pin out of LPMS-ME1

Table 2-1 Pin Descriptions

| Pin# | Name | Function | | Description |
|---|---|---|---|---|
| 1, 25 | VDD | Power | | Power Input (3.3V~5.5V) |
| 2 | NRST | Reset Pin | | Active low reset pin.<br>During normal operation this pin must be driven high or left floating. |
| 5 | CS | Chip select | | SPI chip select (active low) |
| 6 | SDI | Slave Data Input | | SPI serial data input (slave) |
| 7 | SDO | Slave Data Output | | SPI serial data output (slave) |
| 8 | SPC | Serial Clock | | SPI serial clock |
| 10 | MOD0 | Selection pins of interfaces | | These pins determine the signal interface.<br>See Table 2-2 below. |
| 11 | MOD1 | | | |
| 15 | VOUT | Power Output | | 3.3V output (current output < 20 mA) |
| 17 | RTS[1] | UART_RTS | | Hardware flow control in UART full duplex mode (Ready-To-Send) |
| 18 | CTS[1] | UART_CTS | | Hardware flow control in UART full duplex mode (Clear-To-Send) |
| 19 | RX/SDA | UART | UART_RX | Receiver data input |
| | | I2C | I2C_SDA | I2C serial data |
| 20 | TX/SCL | UART | UART_TX | Transmitter data output |
| | | I2C | I2C_SCL | I2C serial clock |
| 22 | BOOT | - | | During normal operation this pin should connect to GND through a pull-down resistor |
| 4, 9, 21, 28 | GND | - | | Connect to GND |
| 3, 12, 13, 14, 16, 23, 24,26, 27 | RES | - | | Reserved pins[2] |

**Notes:**

**[1]Hardware flow control of UART is not used (default).**

**[2]All reserved pins should be left floating.**

Table 2-2 Selections of Communication Interfaces

| MOD0 | MOD1 | Interfaces |
|---|---|---|
| 0 | 0 | UART (default) |
| 0 | 1 | SPI |
| 1 | 0 | I2C (ADD0=0) |
| 1 | 1 | I2C (ADD0=1) |

**Notes:**

**ADD0 is LSB of I2C slave address;**

**MOD0/MOD1 should be driven high or low through a pull-up resistor.**

Table 2-3 Definitions of Logic High and Low Level

| Level | Value | Unit |
|---|---|---|
| Low | 0~0.99 | V |
| High | 2.31~3.3 | V |

## 2.3 Typical Applications

**UART Mode**

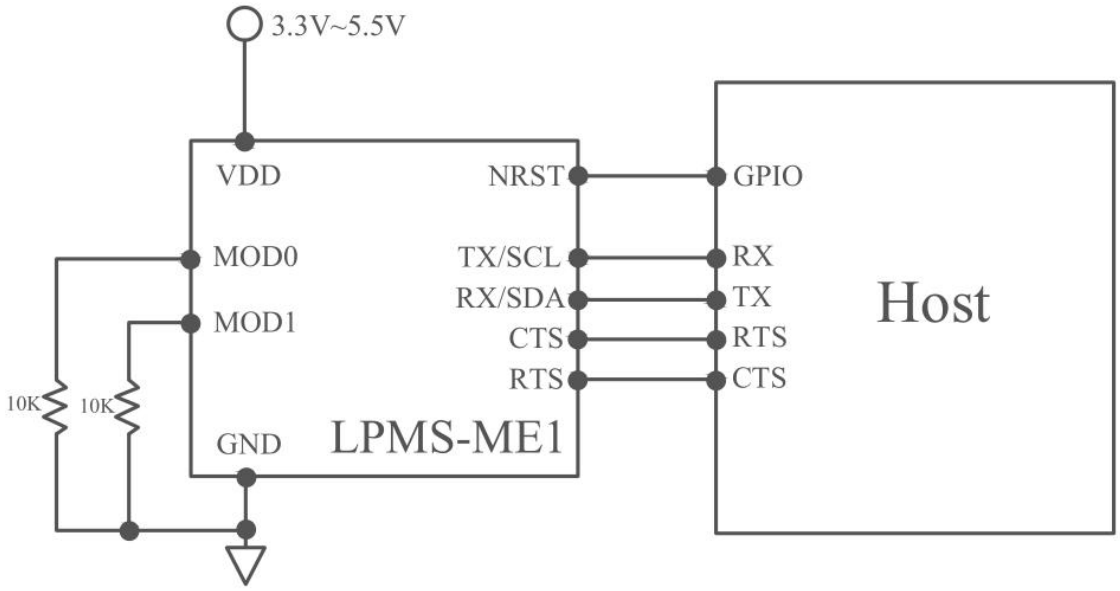


Fig. 2.3. LPMS-ME1 typical application (UART mode)

**Note: Only four pins including VDD, GND, TX and RX are needed to be connected for test.**

**I2C Mode**

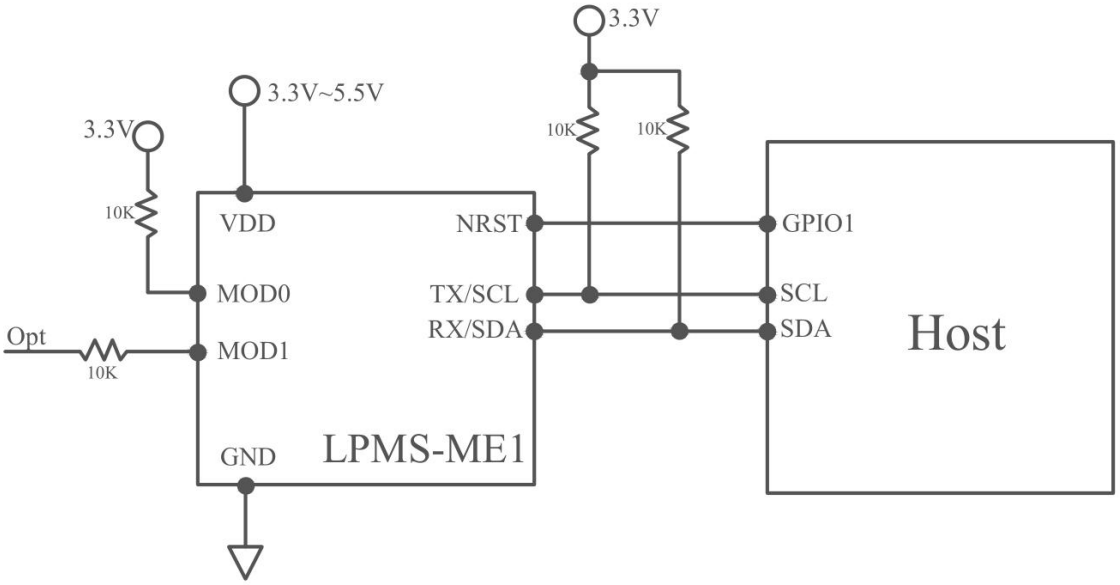


Fig. 2.4. LPMS-ME1 typical application (I2C mode)

**Note: If Opt connects to logic high, ADD0 = 1; if Opt connects to logic low, ADD0 = 0.**

**SPI Mode**

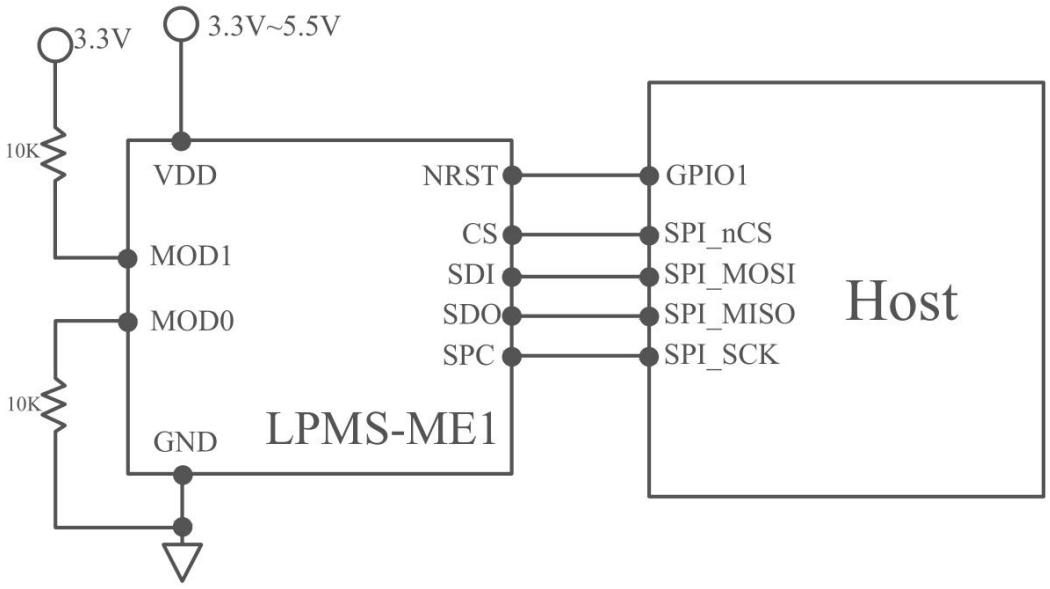


Fig. 2.5. LPMS-ME1 typical application (SPI mode)

## 2.4 Coordinate System

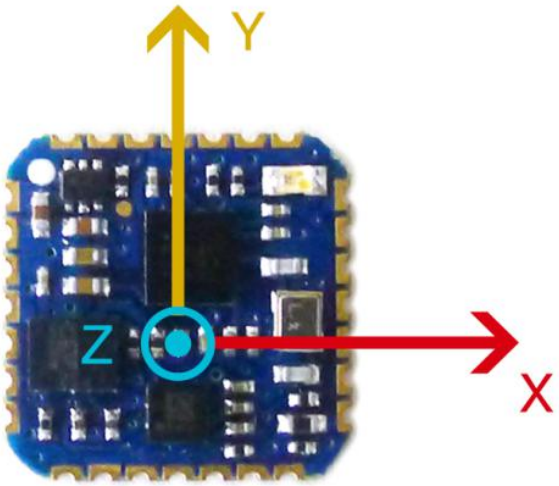


Fig. 2.6.Coordinate system of LPMS-ME1

# 3. Communication Interfaces

LPMS-ME1 provides 3 types of hardware interfaces for users to select based on their own application requirements: UART, I2C and SPI. UART is using LPBUS communication protocol which can be referred to user manual. The register information for I2C and SPI is listed in appendix section.

## 3.1 UART

The universal asynchronous receiver transmitter (UART) is a common interface of asynchronous communication with up to 4.5Mbps baud rate for transmitting and receiving. LPMS-ME1 offers 4 pins (TX, RX, RTS and CTS) for UART configuration. **The default configuration: 115200bps baudrate, 8 bits data length, 1 stop bit, and no parity.** Sequence diagrams of UART are shown as Fig. 3.1 and Fig. 3.2.

TX: Transmit data output.

RX: Receive data input.

RTS: "Request to send" indicates that the USART is ready to receive data (when low).

CTS: "Clear to send" blocks the data transmission at the end of the current transfer when high.

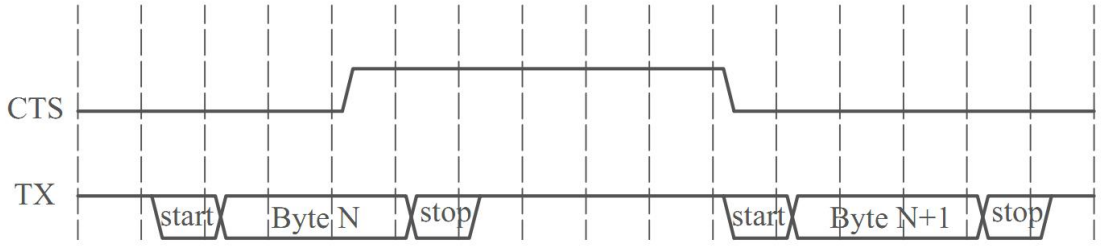


Fig. 3.1. Sequence diagram of transmitter with CTS control

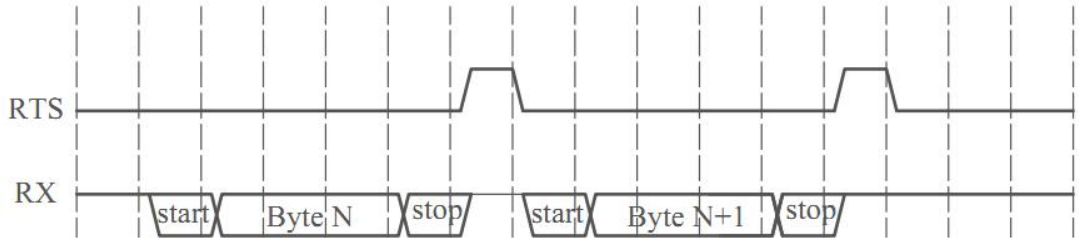


Fig. 3.2. Sequence diagram of receiver with RTS control

## 3.2 I2C

The I2C (Inter-Integrated Circuit) bus is a two-wire serial bus, which handles communications between the microcontroller and the serial I2C bus. The interface is connected to the I2C bus by a data pin (SDA) and by a clock pin (SCL) for receiving and transmitting data. **Generally, it can be connected with a Fast-mode (up to 400 kHz) I2C bus.** When pin MOD0 is driven high, the interface of LPMS-ME1 is set to I2C as a slave device. The slave address is determined by pin MOD1, as shown in Table 3-1

Table 3-1 I2C Slave Address

| MOD1 | $I^2C$ slave address (7 bits) |
|---|---|
| 0 | 0x32 |
| 1 | 0x33 |

See from Fig. 3.3 to Fig. 3.6 for time sequence diagrams of I2C.

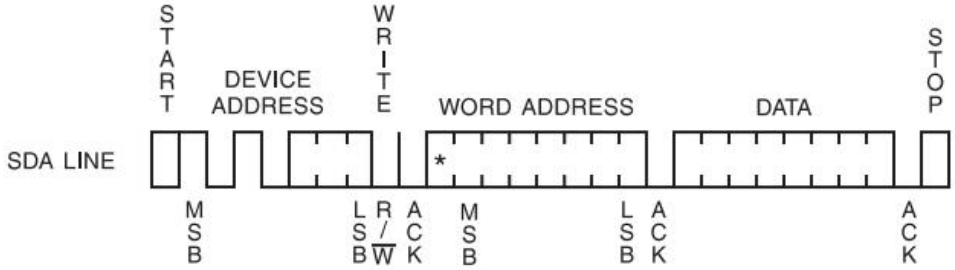


Fig. 3.3. Write a register

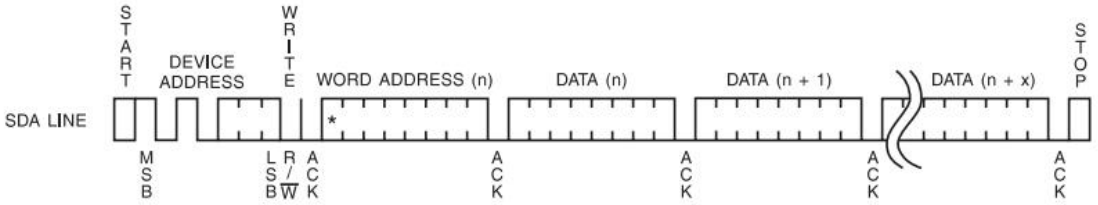


Fig. 3.4. Write multi registers

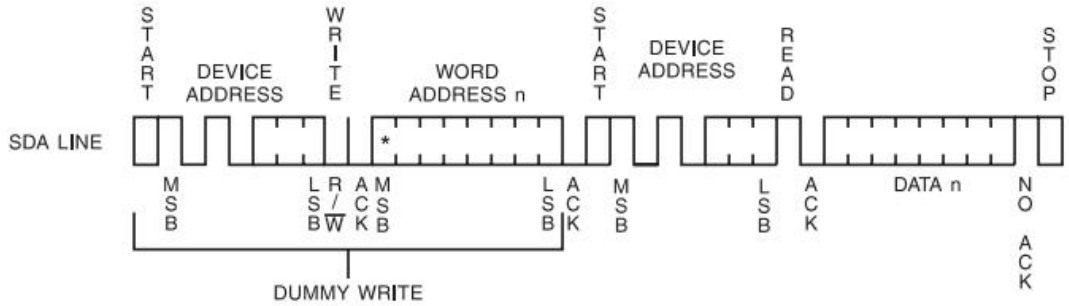


Fig. 3.5. Read a register

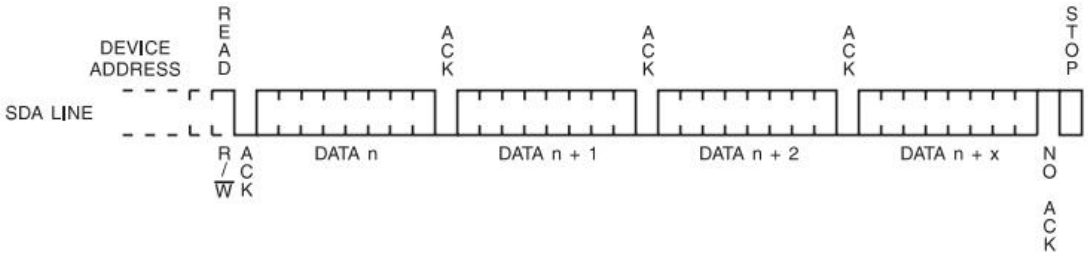


Fig. 3.6. Read multi registers

## 3.3 SPI

The Serial Peripheral Interface (SPI) protocol supports full-duplex synchronous serial communication with external devices. The SPI interface of LPMS-ME1 has four pins including CS, SDI, SDO and SPC. LPMS-ME1 acts as a slave, see Fig. 3.7.

CS: Slave select pin, controlled by Master.

SDI: Master Out / Slave In data. In the general case, this pin is used to receive data.

SDO: Master In / Slave Out data. In the general case, this pin is used to transmit data.

SPC: Serial Clock input pin.

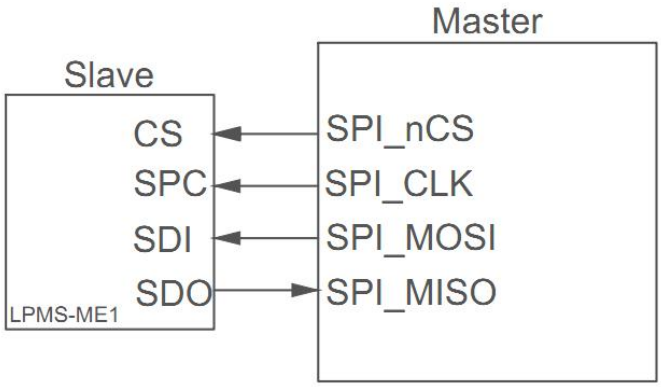


Fig. 3.7. LPMS-ME1 (SPI Mode) connection example

Basic SPI setting：

- CPOL = 0 (Low); CPHA = 0 (1Edge);
- Data length：8 bits
- As slave, maximum supported frequency: 20MHz (recommended: 625KHz).

# 4. Specifications

Table 4-1 Main Specifications

| Parameter | Value |
|---|---|
| Name | LPMS-ME1 |
| Size | 12.0x12.0x2.6mm |
| Weight | 0.3g |
| Orientation Measurement Range | Roll: ±180°; Pitch: ±90°; Yaw: ±180° |
| Resolution | 0.01° |
| Accuracy | <1°（static），<3°（dynamic） |
| Available Output Data | Raw data/Euler angle/Quaternion |
| Power Source | 3.3-5.5V |
| Output Data Rate | 100Hz (Default, 5~400Hz Selectable) |
| Power Consumption (100Hz, UART) | <20mA @ 3.3V |
| Temperature Range | -40~+80℃ |
| Communication Interfaces | UART/I2C/SPI |

Table 4-2 Acceleration Characteristics

| Parameter | Typical Value | Unit |
|---|---|---|
| Measurement Range | ±2/±4/±8/±16 | g |
| Sensitivity | 0.061/0.122/0.244/0.488 | mg/LSB |
| Sensitivity change vs. temperature | ±1 | % |
| Typical zero-g level offset accuracy | ±40 | mg |
| Zero-g level change vs. temperature | ±0.5 | mg/°C |
| Noise density | 90<br>(FS= ±2 g ODR = 104 Hz) | μg/√Hz |

Table 4-3 Gyroscope Characteristics

| Parameter | Typical Value | Unit |
|---|---|---|
| Measurement Range | ±125/±245/±500/±1000/±2000 | dps |
| Sensitivity | 4.375/8.75/17.50/35/70 | mdps/LSB |
| Sensitivity change vs. temperature | ±1.5 | % |
| Typical zero-g level offset accuracy | ±10 | dps |

| | | |
|---|---|---|
| Zero-g level change vs. temperature | ±0.05 | dps/°C |
| Noise density | 7 | mdps/√Hz |

Table 4-4 Magnetometer Characteristics

| Parameter | | Typical Value | Unit |
|---|---|---|---|
| Measurement Range | | ±4/±8/±12/±16 | gauss |
| Sensitivity | | 6842/3421/2281/1711 | LSB/gauss |
| Zero-gauss level | | ±1 | gauss |
| RMS noise (FS = ±12gauss; Ultra-high-performance mode) | X-axis | 3.2 | mgauss |
| | Y-axis | 3.2 | mgauss |
| | Z-axis | 4.1 | mgauss |
| Non-linearity | | ±0.12 | %FS |

# 5. Mechanical information

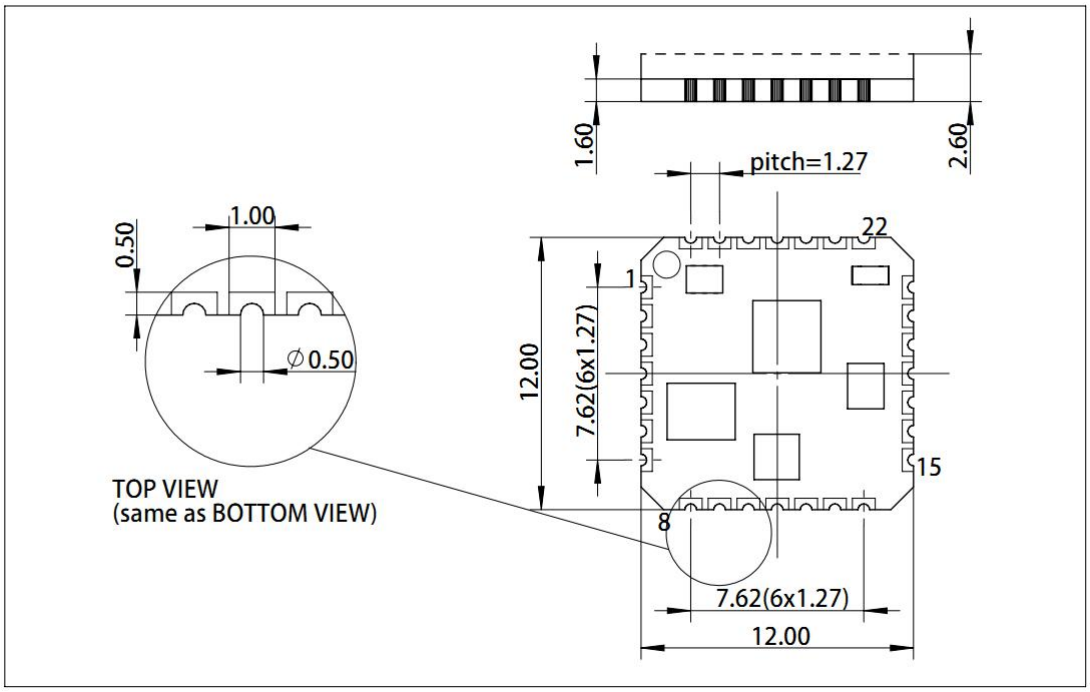


Fig. 5.1. LPMS-ME1 dimension (unit: mm)

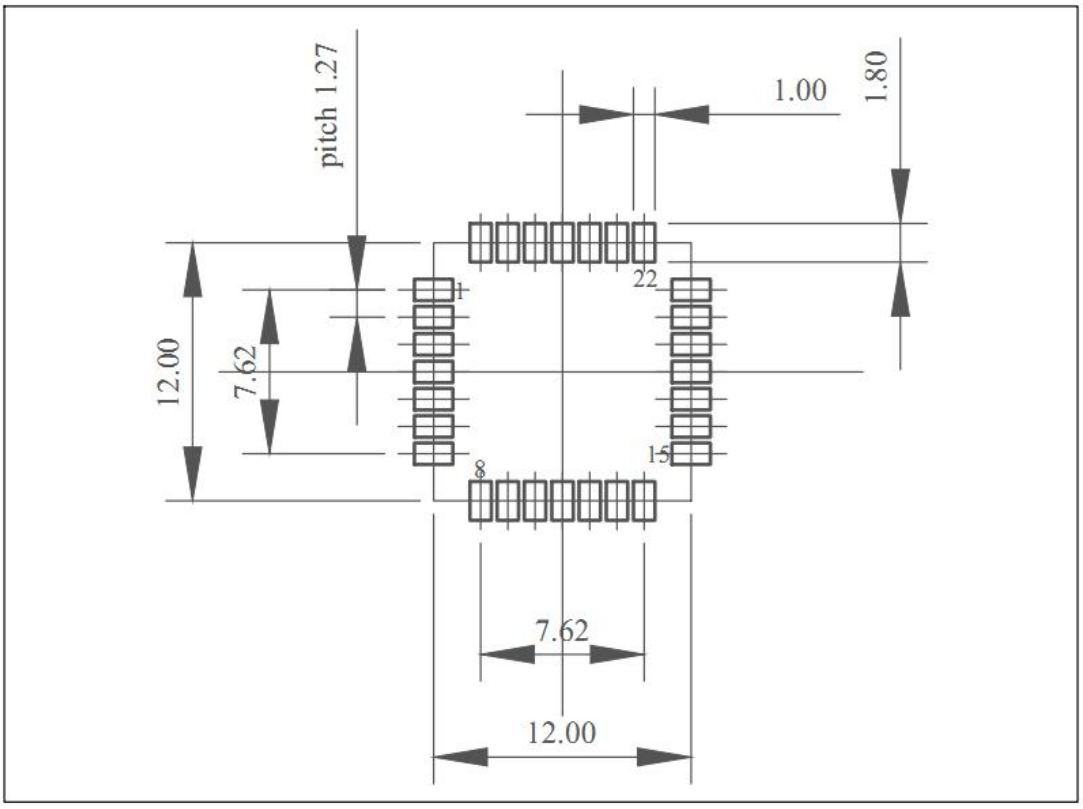


Fig. 5.2. LPMS-ME1 recommended footprint (unit: mm)

# 6. Appendix

**Register address map**

| Addr. | Name | Read/Write | Default value |
|---|---|---|---|
| 0x00 | FUN_CONFIG | Read/Write | 0x00 |
| 0x01 | SYS_CONFIG | Read/Write | 0x01 |
| 0x02 | DATA_CTRL | Read/Write | 0x03 |
| 0x03 | DATA_ENABLE | Read/Write | 0x3F |
| 0x04 | CTRL_0_A | Read/Write | 0x08 |
| 0x05 | CTRL_1_G | Read/Write | 0x0C |
| 0x06 | CTRL_2_M | Read/Write | 0x20 |
| 0x07 | STATUS | Read | 0x00 |
| 0x08 | FILTER_CONFIG | Read/Write | 0x01 |
| 0x09 | OFFSET_SETTING | Read/Write | 0x00 |
| 0x0A~0x19 | - | - | - |
| 0x20 | TIMESTAMP_0 | Read | 0x00 |
| 0x21 | TIMESTAMP_1 | Read | 0x00 |
| 0x22 | TIMESTAMP_2 | Read | 0x00 |
| 0x23 | TIMESTAMP_3 | Read | 0x00 |
| 0x24 | ACC_X_0 | Read | 0x00 |
| 0x25 | ACC_X_1 | Read | 0x00 |
| 0x26 | ACC_X_2 | Read | 0x00 |
| 0x27 | ACC_X_3 | Read | 0x00 |
| 0x28 | ACC_Y_0 | Read | 0x00 |
| 0x29 | ACC_Y_1 | Read | 0x00 |
| 0x2A | ACC_Y_2 | Read | 0x00 |
| 0x2B | ACC_Y_3 | Read | 0x00 |
| 0x2C | ACC_Z_0 | Read | 0x00 |
| 0x2D | ACC_Z_1 | Read | 0x00 |
| 0x2E | ACC_Z_2 | Read | 0x00 |
| 0x2F | ACC_Z_3 | Read | 0x00 |
| 0x30 | GYR_X_0 | Read | 0x00 |
| 0x31 | GYR_X_1 | Read | 0x00 |
| 0x32 | GYR_X_2 | Read | 0x00 |

| | | | |
|---|---|---|---|
| 0x33 | GYR_X_3 | Read | 0x00 |
| 0x34 | GYR_Y_0 | Read | 0x00 |
| 0x35 | GYR_Y_1 | Read | 0x00 |
| 0x36 | GYR_Y_2 | Read | 0x00 |
| 0x37 | GYR_Y_3 | Read | 0x00 |
| 0x38 | GYR_Z_0 | Read | 0x00 |
| 0x39 | GYR_Z_1 | Read | 0x00 |
| 0x3A | GYR_Z_2 | Read | 0x00 |
| 0x3B | GYR_Z_3 | Read | 0x00 |
| 0x3C | MAG_X_0 | Read | 0x00 |
| 0x3D | MAG_X_1 | Read | 0x00 |
| 0x3E | MAG_X_2 | Read | 0x00 |
| 0x3F | MAG_X_3 | Read | 0x00 |
| 0x40 | MAG_Y_0 | Read | 0x00 |
| 0x41 | MAG_Y_1 | Read | 0x00 |
| 0x42 | MAG_Y_2 | Read | 0x00 |
| 0x43 | MAG_Y_3 | Read | 0x00 |
| 0x44 | MAG_Z_0 | Read | 0x00 |
| 0x45 | MAG_Z_1 | Read | 0x00 |
| 0x46 | MAG_Z_2 | Read | 0x00 |
| 0x47 | MAG_Z_3 | Read | 0x00 |
| 0x48 | EULER_X_0 | Read | 0x00 |
| 0x49 | EULER_X_1 | Read | 0x00 |
| 0x4A | EULER_X_2 | Read | 0x00 |
| 0x4B | EULER_X_3 | Read | 0x00 |
| 0x4C | EULER_Y_0 | Read | 0x00 |
| 0x4D | EULER_Y_1 | Read | 0x00 |
| 0x4E | EULER_Y_2 | Read | 0x00 |
| 0x4F | EULER_Y_3 | Read | 0x00 |
| 0x50 | EULER_Z_0 | Read | 0x00 |
| 0x51 | EULER_Z_1 | Read | 0x00 |
| 0x52 | EULER_Z_2 | Read | 0x00 |
| 0x53 | EULER_Z_3 | Read | 0x00 |
| 0x54 | QUAT_W_0 | Read | 0x00 |

| | | | |
|---|---|---|---|
| 0x55 | QUAT_W_1 | Read | 0x00 |
| 0x56 | QUAT_W_2 | Read | 0x00 |
| 0x57 | QUAT_W_3 | Read | 0x00 |
| 0x58 | QUAT_X_0 | Read | 0x00 |
| 0x59 | QUAT_X_1 | Read | 0x00 |
| 0x5A | QUAT_X_2 | Read | 0x00 |
| 0x5B | QUAT_X_3 | Read | 0x00 |
| 0x5C | QUAT_Y_0 | Read | 0x00 |
| 0x5D | QUAT_Y_1 | Read | 0x00 |
| 0x5E | QUAT_Y_2 | Read | 0x00 |
| 0x5F | QUAT_Y_3 | Read | 0x00 |
| 0x60 | QUAT_Z_0 | Read | 0x00 |
| 0x61 | QUAT_Z_1 | Read | 0x00 |
| 0x62 | QUAT_Z_2 | Read | 0x00 |
| 0x63 | QUAT_Z_3 | Read | 0x00 |
| 0x64 | LIN_ACC_X_0 | Read | 0x00 |
| 0x65 | LIN_ACC_X_1 | Read | 0x00 |
| 0x66 | LIN_ACC_X_2 | Read | 0x00 |
| 0x67 | LIN_ACC_X_3 | Read | 0x00 |
| 0x68 | LIN_ACC_Y_0 | Read | 0x00 |
| 0x69 | LIN_ACC_Y_1 | Read | 0x00 |
| 0x6A | LIN_ACC_Y_2 | Read | 0x00 |
| 0x6B | LIN_ACC_Y_3 | Read | 0x00 |
| 0x6C | LIN_ACC_Z_0 | Read | 0x00 |
| 0x6D | LIN_ACC_Z_1 | Read | 0x00 |
| 0x6E | LIN_ACC_Z_2 | Read | 0x00 |
| 0x6F | LIN_ACC_Z_3 | Read | 0x00 |
| 0x70 | TEMP_0 | Read | 0x00 |
| 0x71 | TEMP_1 | Read | 0x00 |
| 0x72 | TEMP_2 | Read | 0x00 |
| 0x73 | TEMP_3 | Read | 0x00 |
| 0x74 | WHO AM I | Read | 0x32 |
| 0x75 | FIRMWARE_VERSION_0 | Read | - |
| 0x76 | FIRMWARE_VERSION_1 | Read | - |

**FUN_CONFIG (0x00)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| WRITE_EN | - | - | - | - | - | - | - |

Bit7: WRITE_EN is used for enabling/disabling the permission of register write operation.

1: enable register write operation;

0: disable register write operation.

For example:

To turn off the sensor LED, FUN_CONFIG Bit7 should be set to 1 before setting SYS_CONFIG Bit0 to 1.

**SYS_CONFIG (0x01)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| SYS_RESET | SYS_REBOOT | - | - | - | - | - | LED |

Bit7: SYS_RESET, set to 1 for resetting all registers to default values.

Bit6: set to 1 for restarting sensor.

Bit0: set to 1 for turning on LED, and 0 for turning off LED.

**DATA_CTRL (0x02)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | TS_RESET | - | ODR | | | |

Bit5: set to 1 for resetting system timestamp.

Bit3~Bit0: setting for data output rate, see the following Table 6-1 for detailed selections.

Table 6-1 Data output rate setting

| Bit3~Bit0 | Data output rate |
|---|---|
| 0000 | 5 Hz |
| 0001 | 10 Hz |
| 0010 | 50 Hz |
| 0011 | 100 Hz (default) |
| 0100 | 200 Hz |
| 0101 | 400 Hz |

**DATA_ENABLE (0x03)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| TEMP | LIN_ACC | QUAT | EULER | MAG | GYR | ACC | TS |

TEMP: to set 1 for temperature data output enabled, and 0 for output disabled.
LIN_ACC: to set 1 for linear acceleration data output enabled, and 0 for output disabled.
QUAT: to set 1 for quaternion data output enabled, and 0 for output disabled.
EULER: to set 1 for Euler data output enabled, and 0 for output disabled.
MAG: to set 1 for magnetic data output enabled, and 0 for output disabled.
GYR: to set 1 for gyroscope data output enabled, and 0 for output disabled.
ACC: to set 1 for accelerometer data output enabled, and 0 for output disabled.
TS: to set 1 for timestamp data output enabled, and 0 for output disabled.

**CTRL_0_A (0x04)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | - | - | ACC_RANGE | | - | - |

Bit3 and Bit2: setting for accelerometer measurements, see the following Table 6-2 for detailed selections.

Table 6-2 Accelerometer measurement range

| Bit3~Bit2 | Range |
|---|---|
| 00 | ±2 g |
| 01 | ±16 g |
| 10 | ±4 g (default) |
| 11 | ±8 g |

**CTRL_1_G (0x05)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| GYR_CALI | - | - | - | GYR_RANGE | | | - |

Bit7: to set 1 for activating gyro bias calibration. This bit will be reset after the calibration is completed.

Bit3~Bit1: setting for gyro measurements, see the following Table 6-3 for detailed selections.

Table 6-3 Gyro measurement range

| Bit3~Bit1 | Range |
|---|---|
| 000 | 245 dps |
| 010 | 500 dps |
| 100 | 1000 dps |
| 110 | 2000 dps (default) |
| 001 | 125dps |

**CTRL_2_M (0x06)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| MAG_CALI | MAG_RANGE | | - | - | - | - | - |

Bit7: to set 1 for activating magnetic calibration. This bit will be reset after the calibration is completed.

Bit6~Bit5: setting for mag measurements, see the following Table 6-4 for detailed selections.

Table 6-4 Magnetic measurement range

| Bit6~Bit5 | Range |
|---|---|
| 00 | 4 gauss |
| 01 | 8 gauss (default) |
| 10 | 12 gauss |
| 11 | 16 gauss |

**STATUS (0x07)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | - | GYR_ CALIBRATING | MAG_ CALIBRATING | - | - | DATA_ READY |

Bit4: 1 for indication of gyro calibration on progress.

Bit3: 1 for indication of mag calibration on progress.

Bit0: 1 for indication of new data ready

**FILTER_CONFIG (0x08)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | LPF_COE | | | FILTER_MODE | | |

Bit5~Bit3: to select the low pass filter coefficient parameters, see Table 6-5.

Bit2~Bit0: to select the sensor filter fusion modes, see Table 6-6.

Table 6-5 Low pass filter setting

| Bit5~Bit3 | Coefficient |
|---|---|
| 000 | NULL (default) |
| 001 | 0.1 |
| 010 | 0.05 |
| 011 | 0.01 |
| 100 | 0.005 |
| 101 | 0.001 |

Table 6-6 Filter mode setting

| Bit2~Bit0 | Filter mode |
|---|---|
| 000 | GYR |
| 001 | GYR+ACC (Kalman), default |
| 010 | GYR+ACC+MAG (Kalman) |
| 011 | GYR+ACC (DCM) |
| 100 | GYR+ACC_MAG (DCM) |

**OFFSET_SETTING (0x09)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | - | - | - | RESET_ OFFSET | HEADING_ RESET | OBJECT_ RESET |

Bit0: to set 1 for Object Reset operation.

Bit1: to set 1 for Heading Reset.

Bit2: to set 1 for Reset Offset.

All these bits will be reset after operation is completed.

**FIRMWARE_VERSION_0 (0x75)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| - | - | - | - | FIRMWARE_VERSION_0 | | | |

FIRMWARE_VERSION_0: third revision number of firmware version.

**FIRMWARE_VERSION_1 (0x76)**

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|
| FIRMWARE_VERSION_2 | | | | FIRMWARE_VERSION_1 | | | |

FIRMWARE_VERSION_1: second revision number of firmware version.

FIRMWARE_VERSION_2: first revision number of firmware version.

For example, firmware version 1.2.3,

FIRMWARE_VERSION_0: 3

FIRMWARE_VERSION_1: 2

FIRMWARE_VERSION_2: 1