

Product introduction

The module uses Bosch's new BMI160 6-axis inertial motion sensor in a MEMS sensor package that integrates the top 16-bit 3-axis accelerometer with an ultra-low-power 3-axis gyroscope. The module can output acceleration data (acceleration values detected by the device in the X, Y, and Z directions) and gyroscope data (the speed at which the device rotates around the X, Y, and Z axes). When accelerometers and gyroscopes operate in full-speed mode, typical power consumption is as low as 950 μ A, which is only 50% or less of the power consumption of similar products on the market.

Designed for smartphones, tablets, and wearable devices, the Bosch BMI160 includes a built-in smart step counter algorithm that reads the number of steps directly through the registers. The built-in 3-axis acceleration and 3-axis gyroscope enable motion detection such as running and fitness. Module built-in LDO power management chip, VIN supports 3.2~6V wide voltage supply, also has a separate 3.3V interface, compatible with Arduino 3.3V and 5V controller direct drive.

Application

1. Walking step
2. Acceleration detection
3. Inclination measurement
4. Display screen switching horizontal / vertical mode

Technical specifications

Working voltage: 3.2V~6V

Current consumption: <1mA

Interface mode: 2.54 pitch pin header

Acceleration optional ruler: $\pm 2g/\pm 4g/\pm 8g/\pm 16g$

Gyro optional scale: $\pm 125^\circ/s$, $\pm 250^\circ/s$, $\pm 500^\circ/s$, $\pm 1000^\circ/s$, $\pm 2000^\circ/s$

Accelerometer zero drift: $\pm 40mg$

Gyroscope zero drift: $\pm 10^\circ/s$

Programmable frequency: 25/32Hz~1600Hz

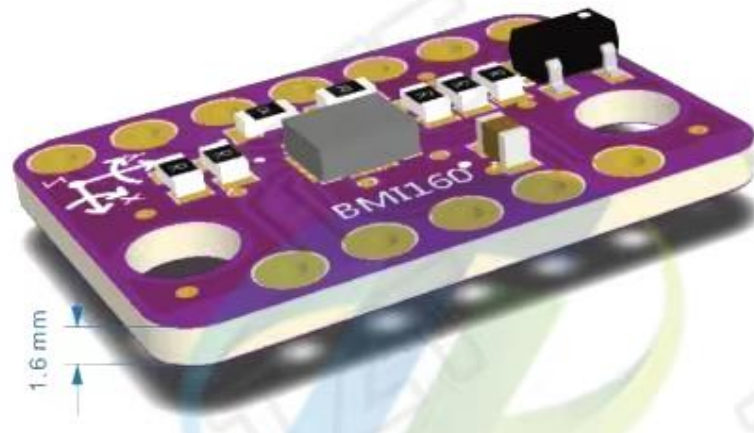
6D detection and positioning

16-bit data output

Impact resistance: 10,000 gx 200 μ s

2 independent programmable interrupt generators

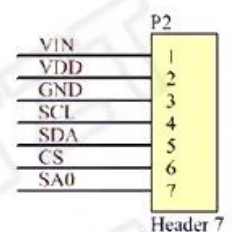
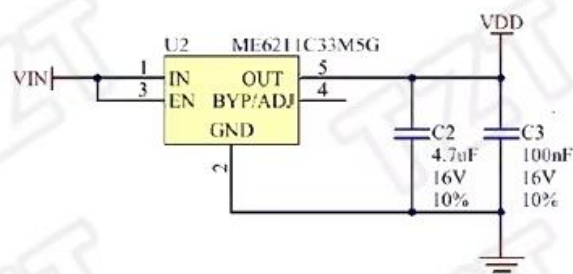
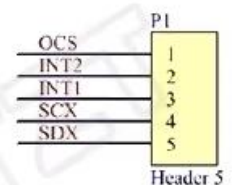
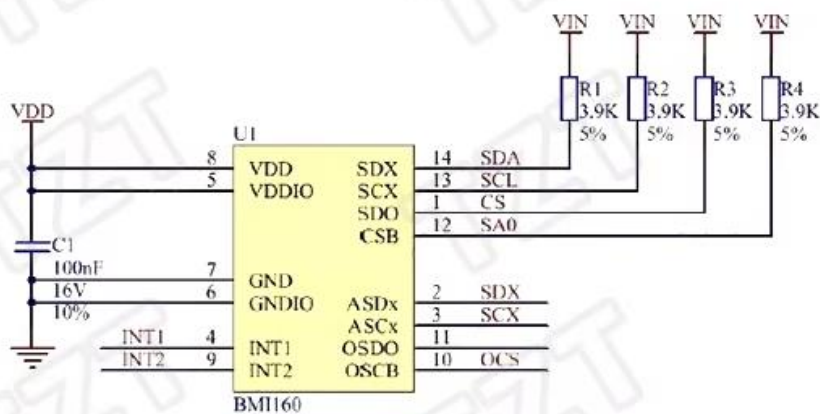
Working temperature: -40 ° C ~ +85 ° C



Pin definition:

BMI160 PINOUT					
	名称	I/O 类型	功能描述	IIC	SPI
1	VIN	Power Supply	Digital I/O supply voltage (3.3V -- 6V)	VCC	VCC
2	3v3	Power Supply	Digital I/O supply voltage(3.3V)	VCC	VCC
3	GND	Ground	Ground for digital & analog	GND	GND
4	SDX/ASDx	Digital I/O	Magnetometer interface*)		
5	SCX/ASCx	Digital out	Magnetometer interface		
6	INT1	Digital I/O	Interrupt pin 1 *) 可配置中断1	INT1	INT1
7	INT2	Digital I/O	Interrupt pin 2 *) 可配置中断2	INT2	INT2
8	OCS	Digital I/O	OIS interface		
9	CS	Digital in	Chip select for SPI mode / Protocol selection pin片选		SS
10	SCL/SCx	Digital in	SCK for SPI serial clock SCL for I ² C serial clock	SCL	SCK
11	SDA/SDx	Digital I/O	SDA serial data I/O in I ² C MOSI serial data input in SPI 4W SISO serial data I/O in SPI 3W	SDA	MOSI
12	SAO/SDO	Digital I/O	Serial data output in SPI(MISO) Address select in I ² C mode	Address select1 I ² C地址选择: [接GND: 0x68 默认 上拉到VCC: 0x69]	MISO

Schematic:



Step measurement example

<https://github.com/MHEtLive/MH-BMI160>

Special note: There are two addresses for I2C, which are 0x69, 0x68. When the address of I2C is set to 0x68 in the program, the SDO on BMI160 needs to be shorted to GND.

<https://github.com/MHEtLive/MH-BMI160>

See attachment for program routine

[illegible]

accelGyro | Arduino 1.8.4

文件 编辑 项目 工具 帮助

accelGyro

```
const int0_t i2c_addr = 0x28;
void setup() {
  Serial.begin(115200);
  delay(100);

  //init the hardware iio160
  if (iio160_softReset() != IIO160_OK){
    Serial.println("reset failed");
    while(1);
  }

  //test and init the iio160 i2c address
  if (iio160_I2CInit(i2c_addr) != IIO160_OK){
    Serial.println("init failed");
    while(1);
  }
}

void loop() {
  int i = 0;
  int result;
  int0_t accelGyro[6] = {0};

  //get both accel and gyro data from iio160
  //parameter accelGyro is the pointer to store the data
  result = iio160_getAccelGyroData(accelGyro);
  if(result == 0){
    for(i=0;i<6;i++){
      //
    }
  }
}
```

上传成功

项目使用了 7888 字节, 占用了 0.40% 的存储空间, 最大为 32256 字节。
全局变量使用了 500 字节, 0.40% 的静态内存, 余留 18328 字节局部变量, 最大为 2048 字节。
找到库文件在 D:\Program Files (x86)\Arduino\libraries\IIO160-IIO160-master 的 Program Files (x86)\Ar
找到库文件在 D:\Program Files (x86)\Arduino\libraries\iio160-master 的 Program Files (x86)\Ar
找到库文件在 D:\Program Files (x86)\Arduino\libraries\IIO160-IIO160-master 的 Program Files (x86)\Ar
找到库文件在 D:\Program Files (x86)\Arduino\libraries\iio160-master 的 Program Files (x86)\Ar

COM4

发送

-0.16	3.51	-2.06	-0.06	0.94	0.10
-110.04	-14.20	-13.99	-0.13	0.70	0.39
-52.28	-24.44	5.18	0.14	0.42	1.26
-10.78	4.19	-1.83	0.88	0.05	-0.12
4.20	1.19	4.05	-0.09	0.05	1.00
-0.66	-0.16	0.45	-0.02	-0.01	0.99
-0.21	-0.24	0.35	-0.02	-0.02	0.99
0.25	-0.16	0.33	-0.02	-0.01	0.99
-0.10	-0.02	0.44	-0.01	-0.02	0.99
0.99	-0.30	0.37	-0.02	-0.02	0.99
0.19	-0.07	0.35	-0.01	-0.02	0.99
0.17	-0.03	0.35	-0.02	-0.01	0.98
0.09	-0.26	0.33	-0.02	-0.01	0.99
0.26	-0.21	0.30	-0.01	-0.01	0.99
0.26	-0.17	0.29	-0.02	-0.01	1.00
0.21	-0.12	0.40	-0.02	-0.01	0.99
0.16	-0.10	0.23	-0.02	-0.02	1.00
0.07	-0.10	0.33	-0.01	-0.02	1.00
0.10	-0.24	0.45	-0.02	-0.02	1.00
0.17	-0.19	0.10	-0.02	-0.02	1.00
0.23	-0.16	0.23	-0.02	-0.02	0.99
0.24	-0.19	0.23	-0.01	-0.01	0.99
0.21	-0.14	0.31	-0.02	-0.02	1.00
0.14	-0.23	0.23	-0.02	-0.01	1.00
0.40	-0.24	0.24	-0.02	-0.02	1.00
0.09	-0.17	0.37	-0.02	-0.01	0.99
0.17	-0.19	0.23	-0.02	-0.02	0.99
0.23	-0.07	0.23	-0.01	-0.02	0.99
0.19	-0.09	0.23	-0.02	-0.01	0.99
0.09	-0.24	0.31	-0.02	-0.01	0.99
0.24	-0.19	0.24	-0.01	-0.02	1.00
0.17	-0.17	0.23	-0.02	-0.01	1.00
0.23	-0.38	0.23	-0.02	-0.01	0.99
0.14	-0.19	0.33	-0.02	-0.02	0.99
0.10	-0.17	0.37	-0.02	-0.02	0.99
0.23	-0.12	0.31	-0.01	-0.02	1.00
0.03	-0.09	0.33	-0.02	-0.01	1.00
0.21	-0.10	0.23	-0.02	-0.02	0.99
0.14	-0.14	0.37	-0.02	-0.02	0.99
0.02	-0.26	0.42	-0.01	-0.01	1.00
0.14	-0.07	0.23	-0.02	-0.01	0.99

☒ 自动滚屏 没有结束符 115200 波特率 Clear output