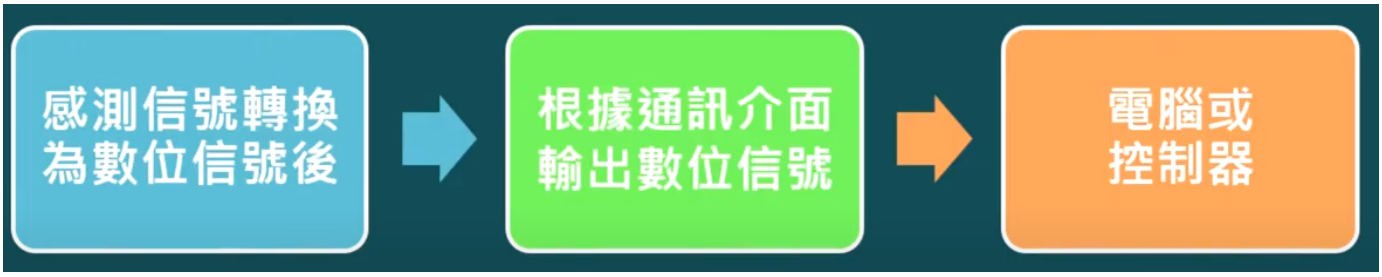
通訊介面

通訊介面概念



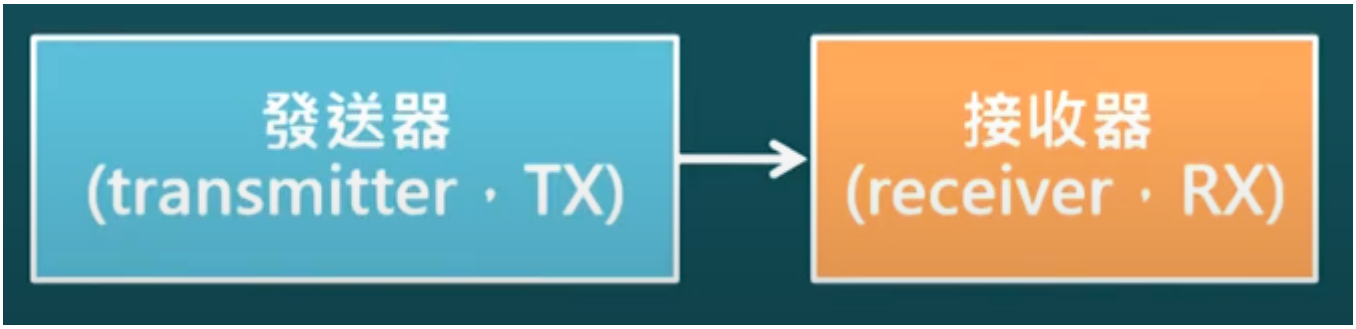
通訊介面就是能夠將數位訊號轉換成一定格式，以至接受端可以正確接收到

UART

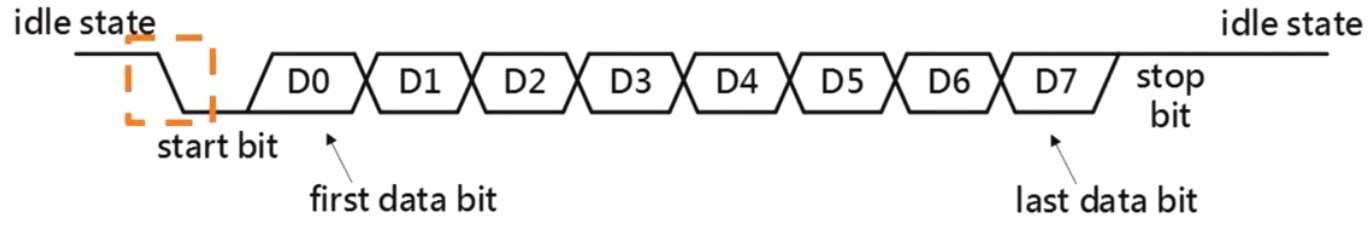
1. 通用非同步接收發送(UART, universal asynchronous receiver/transmitter)：用來做串列通訊(serial communication)的標準，常見的RS-232及RS-485都屬於UART的通訊標準之一。

2. 串列通訊(serial communication)的標準也是目前高速數位傳輸的標準做法，目前以一條線傳送多組資料。

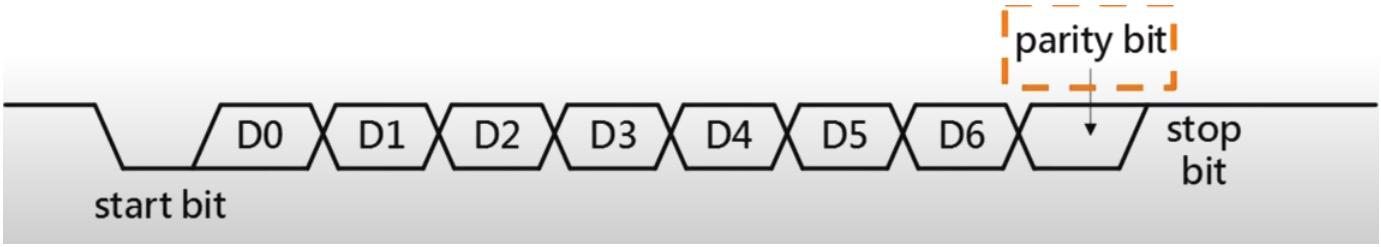
3. 其中asynchronous指在發送器和接受器之間沒有線來傳送時脈訊號(clock signal

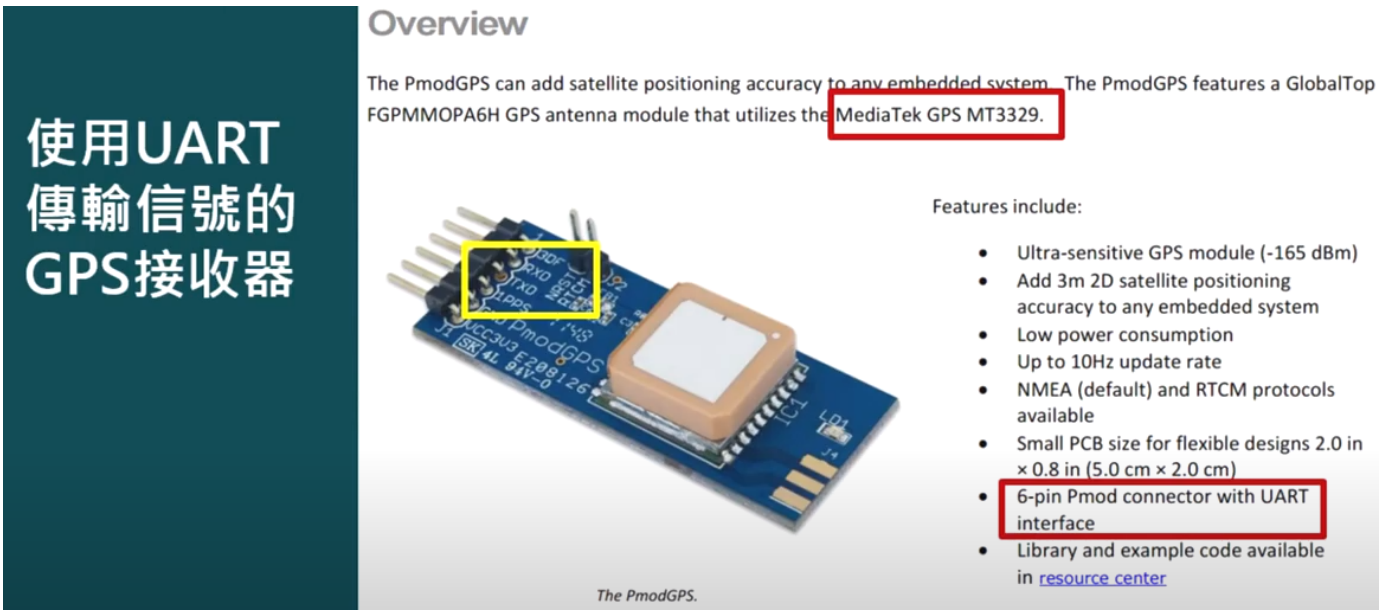


4. 因為沒有時脈訊號，所以發送端和接受端都要知道訊號的位元率(bit rate)，否則無法正確接收訊號。



5. 錯誤檢查：parity check可設為even(偶同位)或odd(奇同位)。例如：D0-D6為0101001。若設為偶同位，則parity bit設為0，使得全部傳輸的bit為1的數目為偶數。也可以設為none，如此將不傳送parity bit。





I2C

1. I^2C = Inter IC

2. I^2C是串列通訊的標準，由Philips半導體公司(現為NXP)於1982年所發展出來的

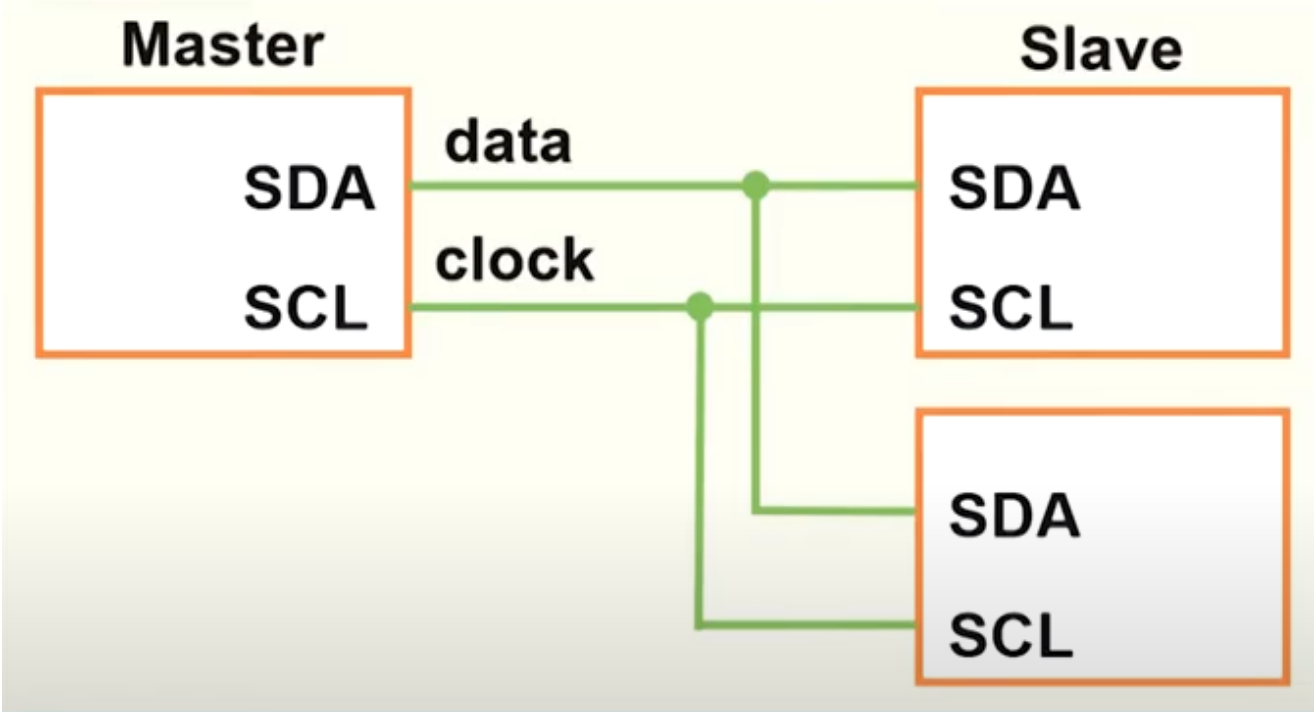
3. 有兩條訊號線：一條SDA傳遞資料(Data)，另一條SCL傳遞時脈(clock)

4. 雙向訊號傳輸

5. 同步通訊

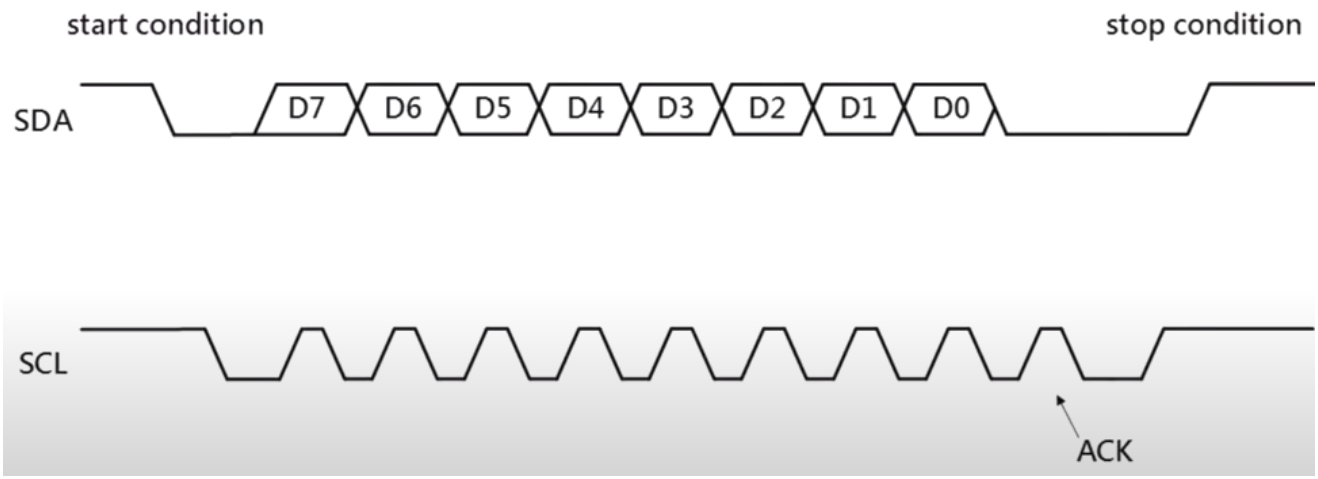
6. 傳輸速度

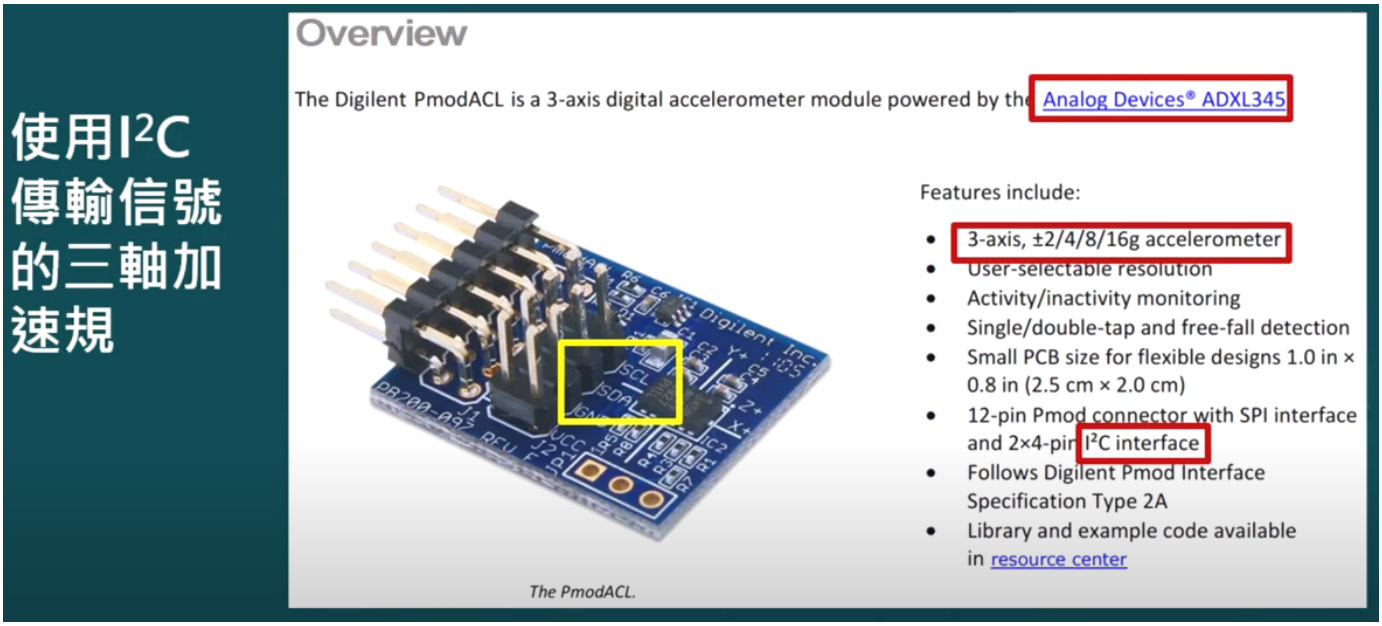
Mode	Speed
Standard mode	100 kbps
Fast mode	400 kbps
Fast model plus	1000 kbps
High-speed mode	3400 kbps
Ultra-fast mode	5000 kbps

7. 

可以有一個或多個主端及從屬端，經由SDA選擇data要傳輸給哪一個slave

8. Signaling waveform





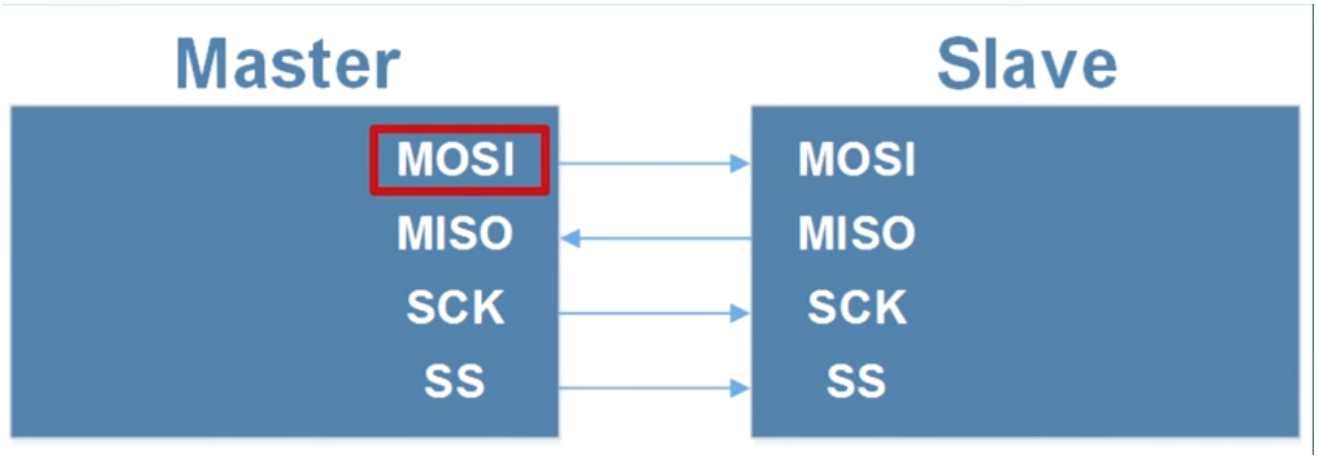
SPI

1. Serial Peripheral Interface

2. SPI是串列通訊的標準，由Motorola半導體(現為Freescale)所發展出來的

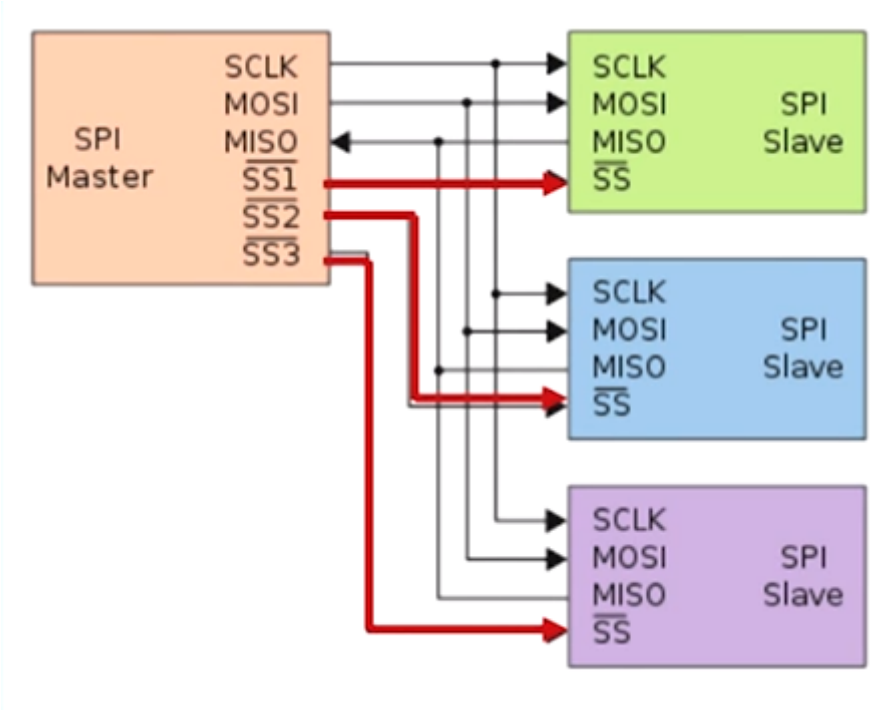
3. 雙向訊號傳輸

4. 有4條訊號線：2條傳遞資料(data)，可以同時收發訊號，一條傳遞時脈(clock)，另一條作從屬端的選擇(slave select)



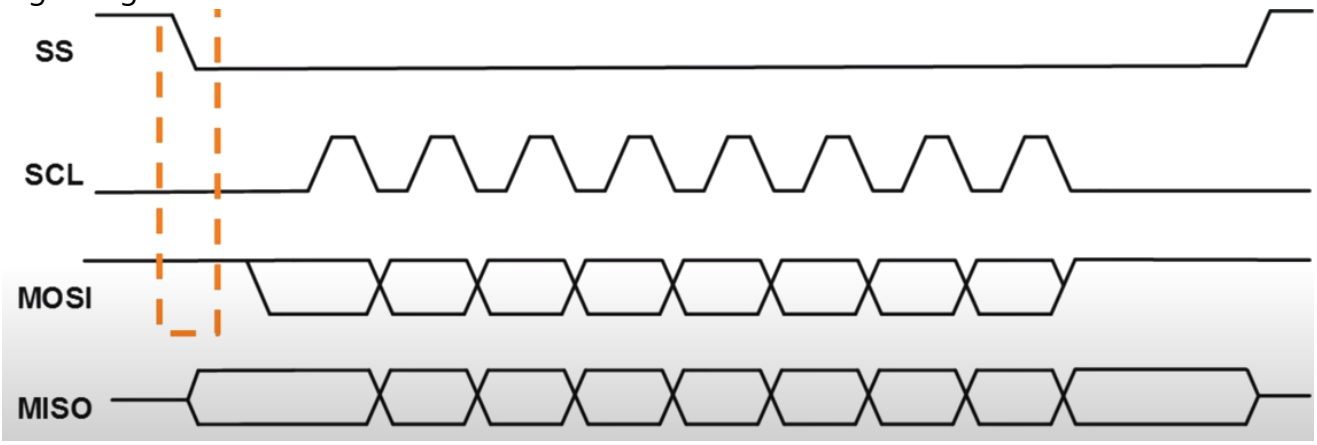
MOSI：Master Out Slave In

5.



SS從高電位->低電位，slave端就知道要接受訊號

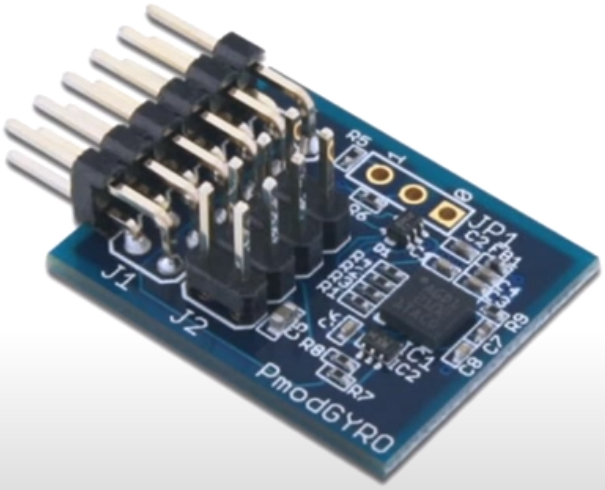
6. Signaling waveform



可以在serial clock設定，可以在低電位切到高電位的時候去讀訊號，也可以在高電位切到低電位去讀訊號

Overview

The PmodGYRO is a 3-axis gyroscope powered by the STMicroelectronics L3G4200D. By communicating with the chip through SPI or I²C, users may configure the module to report angular momentum at a resolution of up to 2000 dps at an output rate up to 800Hz.



The PmodGYRO.

Features include:

- 3-axis MEMS digital gyroscope with high shock survivability
- Get angular momentum data with user selectable resolution (250/500/2000dps)
- Two customizable interrupt pins
- User configurable signal filtering
- Power-down and Sleep modes
- Small PCB size for flexible designs 1.0 in × 0.8 in (2.5 cm × 2.0 cm)
- 12-pin Pmod connector with SPI interface and additional I²C interface
- Library and example code available in resource center