1. DESCRIPTION

MT3102 is an advanced miniature optical light-to-digital converter, integrated with a proximity sensor and 940nm IR VCSEL. Customers can improve the system efficiency with the supported features and settings of module.

MT3102 incorporates photodiode, timing controller and ADC. The detect/release events can be interrupt driven, and occur when proximity result crosses upper and/or lower threshold settings.

MT3102 provides a wide range of offsets adjustment to compensate the unexpected IR energy reflection into the sensor, the proximity results are further improved by automatic ambient light elimination method. Besides, it employs a noise cancellation scheme to highly reject the unwanted ambient noise.

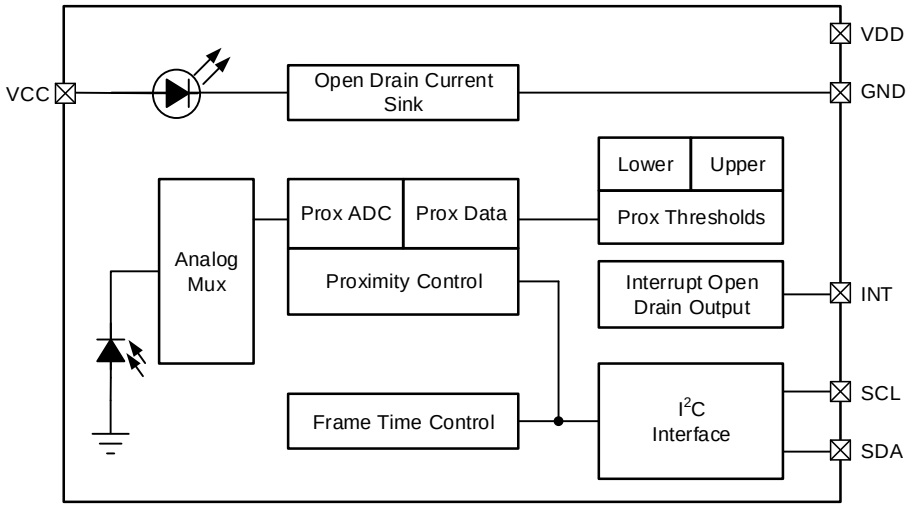
2. FEATURES

- Wide operating temperature range: -30°C~85°C
- Built-in temperature compensation circuit and power on reset circuit
- Ultra-low power consumption
  - 1.8V power supply with 1.8V I^2C bus
  - Total active current under 10μA@100ms (including VCSEL current)
  - Idle and sleep mode current: 0.7μA
- Built-in VCSEL driver with flexible setting
- VCSEL pulse width and count selection
- VCSEL current: 7mA
- Low noise design
- High ambient light suppression
- ADC resolution selectable for 16 bits
- Lead-free package (RoHS compliant)
- Dedicated optimized package design for small wearable devices

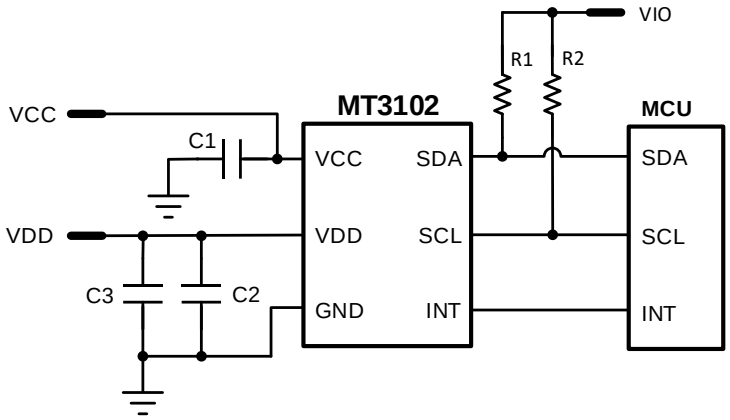
3. APPLICATIONS

- True-wireless stereo earbuds
- Glasses
- Watches

4. FUNCTIONAL BLOCK DIAGRAM



5. TYPICAL APPLICATION CIRCUIT



Corresponding bill of material (BOM) is shown below.

Component	Recommended Value	Condition/Range
R1, R2	1kΩ to 10kΩ	
C1, C3	1μF ±20%, X7R / X5R Ceramic	Close to the sensor as much as possible.
C2	0.1μF ±20%, X7R / X5R Ceramic	Close to the sensor as much as possible.

Note:

- *Selection of pull-up resistors value is dependent on the bus capacitance values.*
- *INT pin is an Open Drain output. If no interrupt signal needed, the INT pin can connect directly to ground and won't have current leakage.*