MAXIC Maximizing IC Performance Module

# **1. DESCRIPTION**

MT3101 is an infrared light to digital converter with a built-in 940nm VCSEL diode and I<sup>2</sup>C interfaces. This device provides infrared sensing to allow proximity estimation featured with interrupt function.

MT3101 incorporates a photodiode, timing controller and ADC. The spectral response of MT3101 is optimized for infrared light whose wavelength is 940nm. MT3101 employs a noise cancellation scheme to highly reject unwanted ambient noise. The proximity engine features a wide range offset adjustment to compensate for unwanted IR energy reflection at the sensor.

MT3101 is designed to meet the Class 1 laser safety limits including single faults in compliance with IEC/ EN 60825-1: 2014 and IEC/ EN 60825-1: 2007.

# 2. FEATURES

- Fully digital control with I<sup>2</sup>C interface
  - Support Fast mode (up to 400kHz)
  - Support 3 kinds I<sup>2</sup>C ID Address
- Built-in temperature compensation circuit and power on reset circuit
- Wide operating temperature range (-20°C to 85°C)
- Built-in VCSEL driver with flexible setting
  - VCSEL pulse width and count selection
  - VCSEL current: 2mA to 16mA
- Low noise design
- High ambient light suppression
- Up to 12 bits resolution for proximity detection
- Ultra-low power consumption
- Lead-free package (RoHS compliant)

# 3. APPLICATIONS

- TWS (True Wireless Stereo)
- IoT application
- Tablet PC
- Wearable



## Figure 1 Block Diagram

## 4. FUNCTIONAL BLOCK DIAGRAM



# 5. TYPICAL APPLICATION CIRCUIT



Figure 2 Typical Application Circuit

#### Table 1 Bill of Material

Component	Recommended Value	Condition/Range
VLED	The voltage needs to be greater than 2.7V, and depends on system design.	
R1, R2	Typical 2.2K $\Omega$ , depends on system design <sup><math>0</math></sup> .	
R3	Typical 10KΩ, depends on system design <sup><math>①</math></sup> .	
C1	0.1µF, ±20%	Close to the sensor as much as possible.
C2 (Optional)	1.0μF, ±20%	Close to the sensor as much as possible.
C3	2.2µF, ±20%	Close to the sensor as much as possible.

## Note:

()  $I^2C$  Pull-up resistor for standard protocol format.