ABRIDGED DATA SHEET

MAX86165/MAX86168

Miniature Optical Heart Rate Module

General Description

The MAX86165/MAX86168 is an ultra-low-power, completely integrated, optical data acquisition system. On the transmitter side, the MAX86165 has a programmable low-noise LED driver with an IR emitter while the MAX86168 adds a Green emitter. On the receiver side, the MAX86165/MAX86168 comprises a high efficiency PIN photodiode and an optical readout channel. The optical readout has a low-noise signal conditioning analog front end (AFE), including 20-bit analog-to-digital converter (ADC) and an industry-leading ambient light cancellation (ALC) circuit. Due to the low power consumption, compact size, ease and flexibility of use, the MAX86165/MAX86168 is ideal for a wide variety of optical sensing applications such as heart rate detection and proximity sensing in small spaces such as ear buds.

The MAX86165/MAX86168 operates on a single 2.7V to 5.5V V_{LED} supply voltage. Each device has a 128-word built-in FIFO. The MAX86165/MAX86168 is available in a 10-pin OLGA package with compact package dimensions of 2mm x 2.5mm x 0.82mm and operates over -40ºC to +85ºC temperature range.

Applications

- Optimized for In-Ear Applications
- AR/VR Glasses
- Miniature Package for Mobile Applications
- Heart Rate and Heart Rate Variability Measurements
- Proximity Detection

Benefits and Features

- Complete Single-Channel Optical Data Acquisition System in a Tiny Module
- Optimized Architecture for Reflective Heart Rate Monitoring
- Integrated Infrared Proximity Sensing
- High-Resolution 20-Bit Charge Integrating ADC
- Low-Noise 8-Bit LED Current DAC
- Excellent Signal to Noise Ratio (SNR) up to 94.5dB in White Card Loop-Back Test
- Excellent Ambient Range and Rejection
  - Up to 200µA Ambient DC Current
  - 80dB Ambient Rejection at 120Hz
- Ultra-Low-Power Operation for Wearable Devices
- Integrated Photodiode and Infrared LED
- Integrated Green LED (MAX86168 Only)
- Capability to Control an External LED (MAX86165 Only)
- Miniature 2mm x 2.5mm x 0.82mm 10-Pin OLGA Package

Ordering Information appears at end of data sheet.

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Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/23	Release for Market Intro	—
1	7/25	Added information for MAX86168	4-9, 12-13, 78-79

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