

FEATURES

- 2.8 mm × 5.0 mm module with integrated optical components
- One 660 nm LED1, one 880 nm LED2, one 4-channel photodiode
- True 2-channel, 370 mA LED driver
- Specifically designed for ultralow direct optical reflections
- Separate LED and AFE settings for each channel
- Dual data registers for each LED return signal
- 14-bit ADC
- 20-bit burst accumulator enabling 20 bits per sample period
- On-board sample to sample accumulator enabling up to 27 bits per data read
- Custom optical package made to work under a glass window

APPLICATIONS

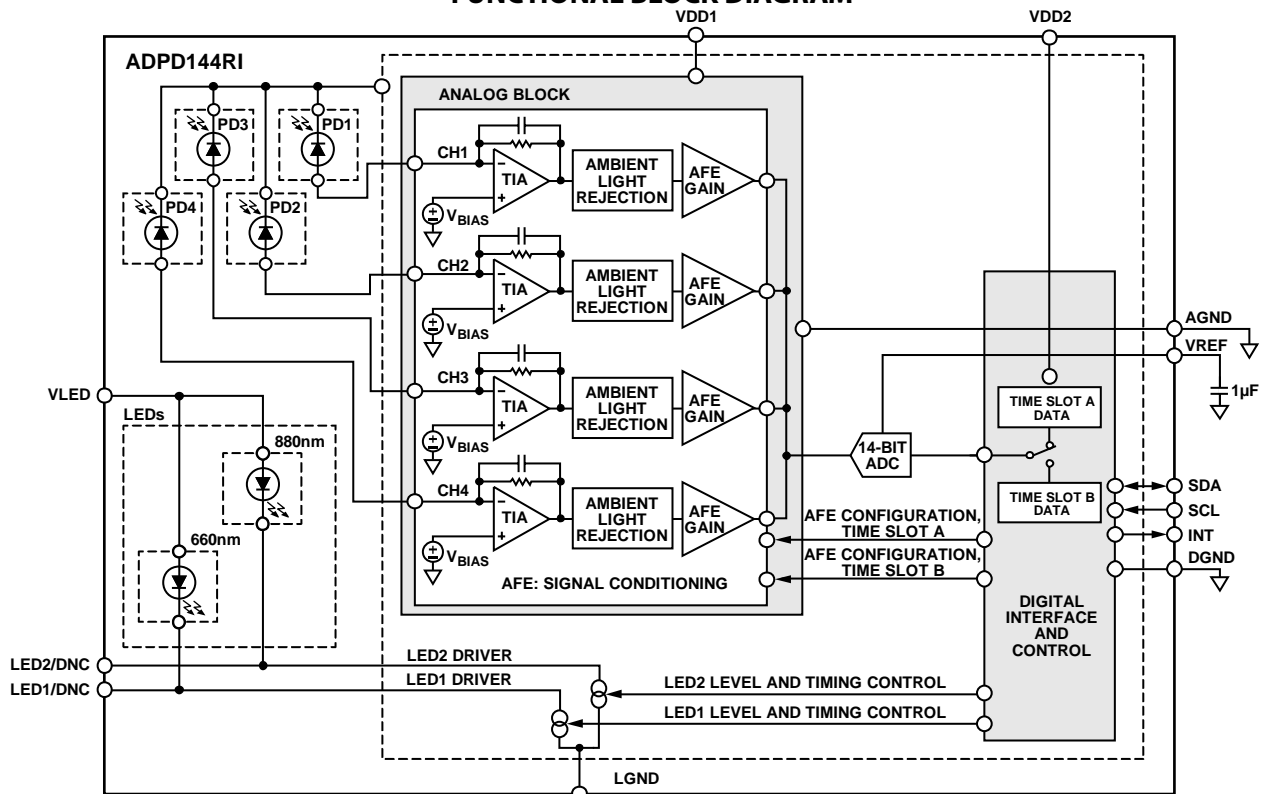
- Optical heart rate monitoring
- Reflective SpO₂ measurement

GENERAL DESCRIPTION

The ADPD144RI is a complete photometric system designed to measure optical signals from ambient light and from synchronous reflected light emitting diode (LED) pulses. Synchronous measurement offers best-in-class rejection of ambient light interference, both dc and ac. The module integrates a highly efficient photometric front end, two LEDs, and a 4-channel photodiode (PD). All of these components are housed in a custom package that prevents light from going directly from the LED to the photodiode without first entering the subject.

The front end of the application specific integrated circuit (ASIC) consists of a control block, a 14-bit analog-to-digital converter (ADC) with a 20-bit burst accumulator, and two flexible, independently configurable LED drivers. The control circuitry includes flexible LED signaling and synchronous detection. The analog front end (AFE) processes data on two separate data paths in parallel, with the option of separate AFE settings. The data output and functional configuration occur over a 1.8 V I²C interface.

FUNCTIONAL BLOCK DIAGRAM



NOTES
1. DNC = DO NOT CONNECT TO THIS PIN UNLESS DRIVING EXTERNAL LEDs.

Figure 1.

For more information about the ADPD144RI, contact Analog Devices, Inc., at optical_sensors@analog.com.

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Data Sheet

- ADPD144RI: Integrated Optical Module with Ambient Light Rejection and Two LEDs

[DESIGN RESOURCES](#)

- ADPD144RI Material Declaration
- PCN-PDN Information
- Quality And Reliability
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OUTLINE DIMENSIONS

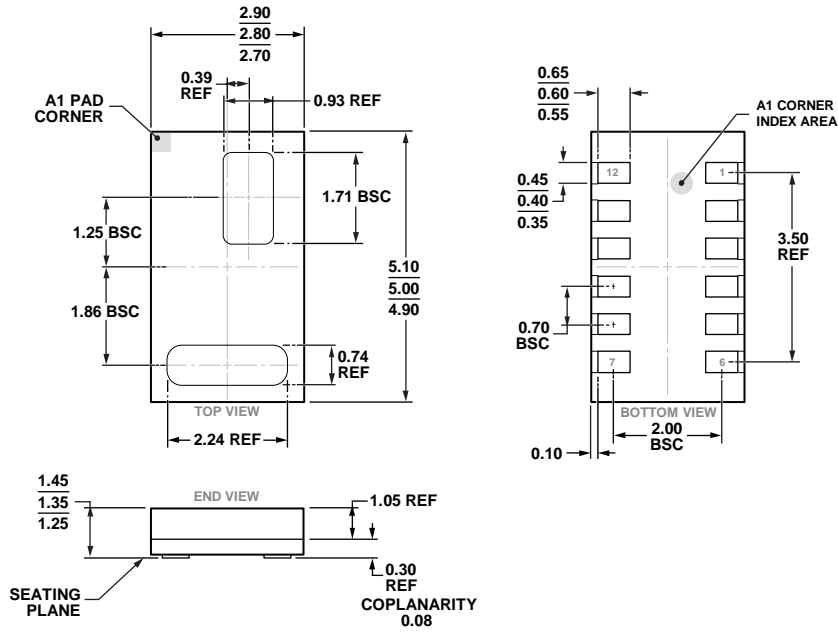


Figure 2. 12-Terminal Chip Array Small Outline No Lead Cavity [LGA_CAV]
 2.8 mm × 5.0 mm Body
 (CE-12-2)
 Dimensions shown in millimeters

I²C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).