ANALOG DEVICES

Integrated Optical Module with Ambient Light Rejection and Two LEDs

Data Sheet

ADPD144RI

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 SpO_2 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 I^2C interface.

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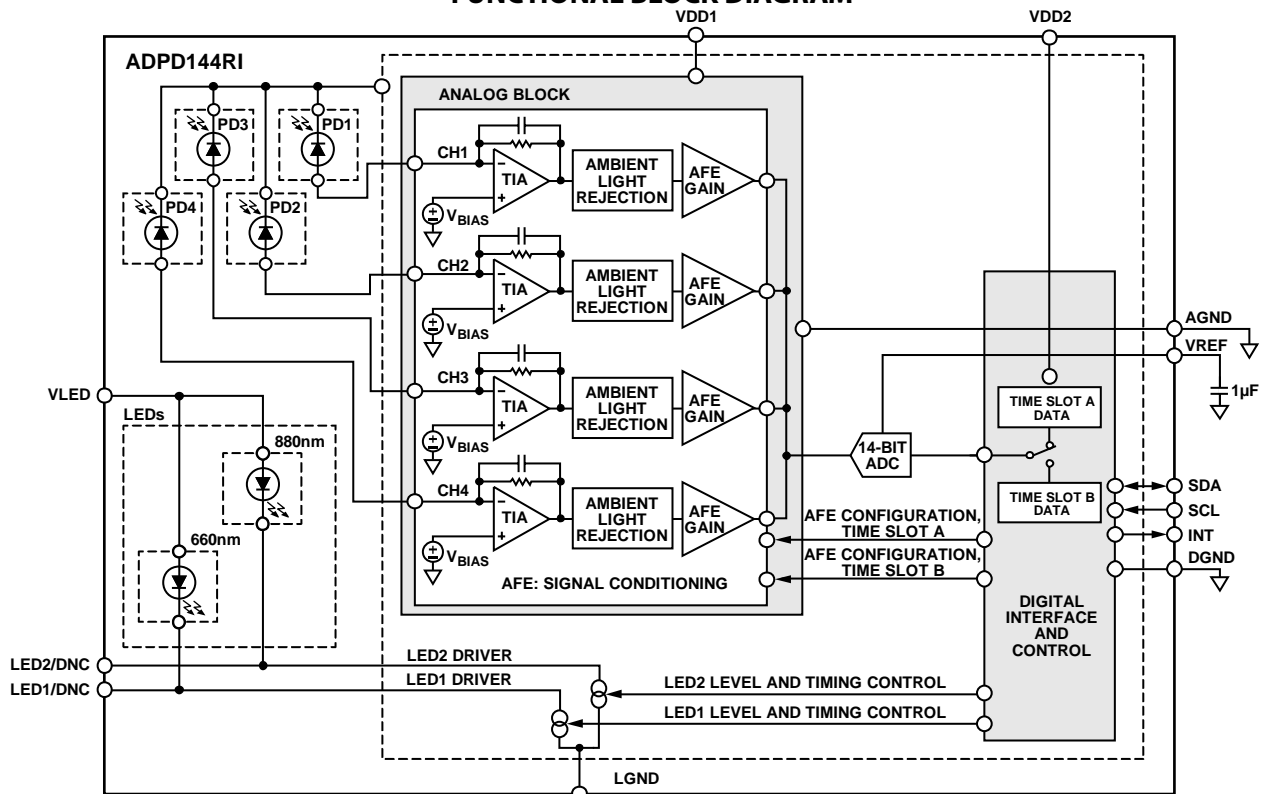
NOTES
1. DNC = DO NOT CONNECT TO THIS PIN UNLESS DRIVING EXTERNAL LEDs.

Figure 1.

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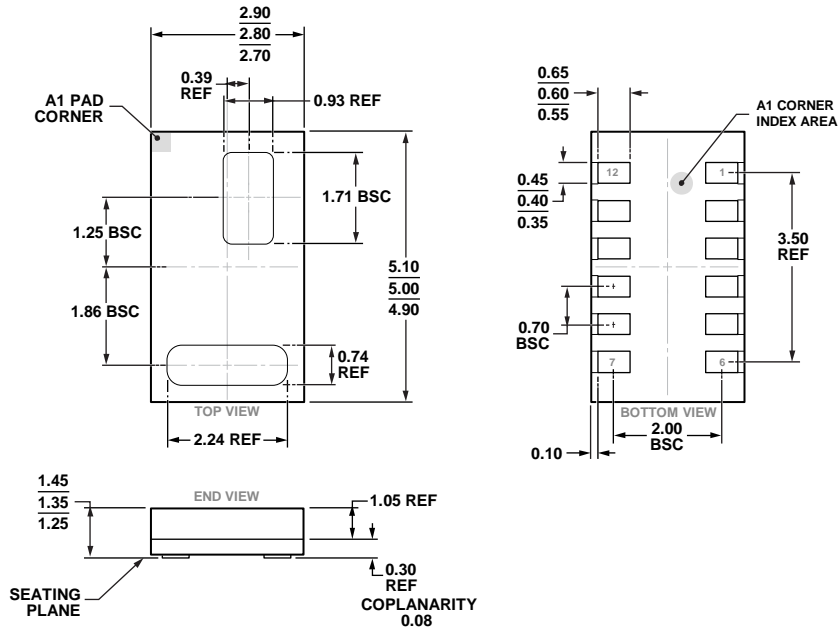
OUTLINE DIMENSIONS

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).

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