Integrated Optical Module with Ambient Light Rejection and Three LEDs

Data Sheet

ADPD175GGI

FEATURES

- 2.8 mm × 6.5 mm module with integrated optical components
  - 2 green LEDs located on either side of the photodiode,
  - 1 infrared LED, and 1 photodiode
- True 3-channel 370 mA LED driver
- 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 designed to operate under a glass window
- Optimized signal-to-noise ratio (SNR) for signal limited cases

APPLICATIONS

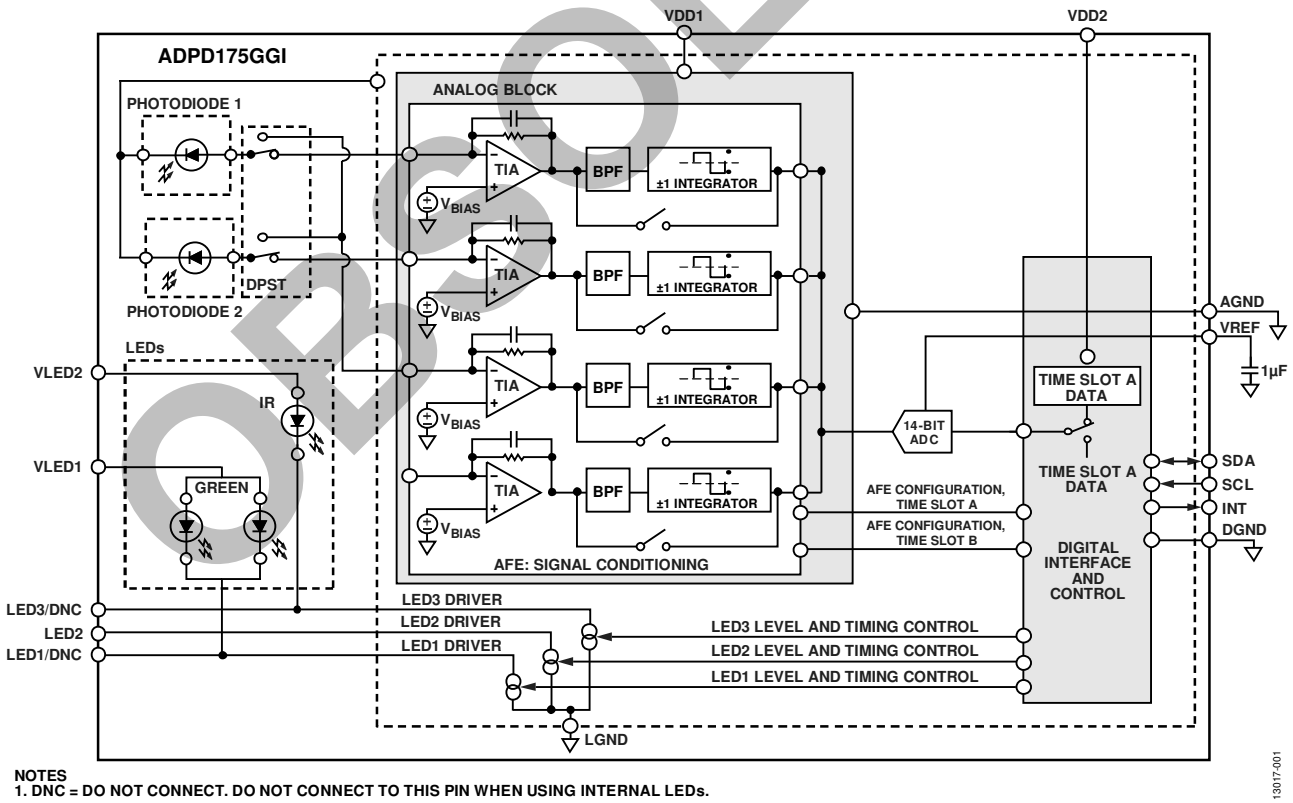
- Optical heart rate monitoring (HRM)
- Reflective SpO_2 measurement

GENERAL DESCRIPTION

The ADPD175GGI is a complete photometric system designed to measure optical signals from ambient light and from synchronous reflected 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, three LEDs, and a photodiode (PD). All these items are housed in a custom package that prevents light from moving 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 three flexible, independently configurable LED drivers. The control circuitry includes flexible LED signaling and synchronous detection. The analog front end (AFE) features best-in-class rejection of signal offset and corruption due to modulated interference commonly caused by ambient light. The data output and functional configuration occur over a 1.8 V I²C interface.

FUNCTIONAL BLOCK DIAGRAM



NOTES
1. DNC = DO NOT CONNECT. DO NOT CONNECT TO THIS PIN WHEN USING INTERNAL LEDs.

Figure 1.

For more information about the ADPD175GGI, contact Analog Devices, Inc., at optical_sensors@analog.com.

Rev. SpA Document Feedback

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NOTES

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

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