

ISL29035

Integrated Digital Light Sensor with Interrupt

FN8371  
Rev 3.00  
December 12, 2016

The [ISL29035](#) is an integrated ambient and infrared light-to-digital converter with I<sup>2</sup>C (SMBus compatible) Interface. Its advanced self-calibrated photodiode array emulates human eye response with excellent IR rejection. The on-chip ADC is capable of rejecting 50Hz and 60Hz flicker caused by artificial light sources. The Lux range select feature allows users to program the Lux range for optimized counts/Lux.

For ambient light sensing, an internal 16-bit ADC has been designed based upon the charge-balancing technique. The ADC conversion time is nominally 105ms and is user adjustable from 11µs to 105ms, depending on oscillator frequency and ADC resolution. In normal operation, typical current consumption is 57µA. In order to further minimize power consumption, two power-down modes have been provided. If polling is chosen over continuous measurement of light, the auto power-down function shuts down the whole chip after each ADC conversion for the measurement. The other power-down mode is controlled by software via the I<sup>2</sup>C interface. The power consumption can be reduced to less than 0.3µA when powered down.

The ISL29035 supports a software brownout condition detection. The device powers up with the brownout bit asserted until the host clears it through the I<sup>2</sup>C interface.

The ISL29035 supports a software and hardware interrupt that remains asserted until the host clears it through the I<sup>2</sup>C interface. Function of ADC conversion continues without stopping after interrupt is asserted.

Designed to operate on supplies from 2.25V to 3.63V with an I<sup>2</sup>C supply from 1.7V to 3.63V, the ISL29035 is specified for operation across the -40°C to +85°C ambient temperature range.

**Features**

- Resolution . . . . . 16-bit ADC
- Wide dynamic range . . . . . 1:4,200,000
- Integrated noise reduction . . . . . 50/60Hz
- Close to human eye response with excellent IR/UV rejection
- Shutdown modes. . . . . software and automatic
- Programmable interrupt threshold with persistence filter
- Supply current (typical) . . . . . 57µA
- Shutdown current (maximum) . . . . . 0.51µA
- I<sup>2</sup>C (SMB compatible) power supply . . . . . 1.7V to 3.63V
- Sensor power supply . . . . . 2.25V to 3.63V
- Operating temperature range. . . . . -40°C to +85°C
- Small form factor package . . . . . 6 Ld 1.5x1.6x0.75 ODFN

**Applications**

- Mobile devices: smart phone, PDA, GPS
- Computing devices: notebook PC, MacBook, tablets
- Consumer devices: LCD-TV, digital camera
- Industrial and medical light sensing

**Related Literature**

- [AN1591](#), "Evaluation Hardware/Software Manual for ALS and Proximity Sensor"

TABLE 1. KEY DIFFERENCES BETWEEN FAMILY OF PARTS

PART NUMBER	ALS SENSING	INTERRUPT PIN	NUMBER OF PINS
ISL29034	Yes	No	4 Ld
ISL29035	Yes	Yes	6 Ld

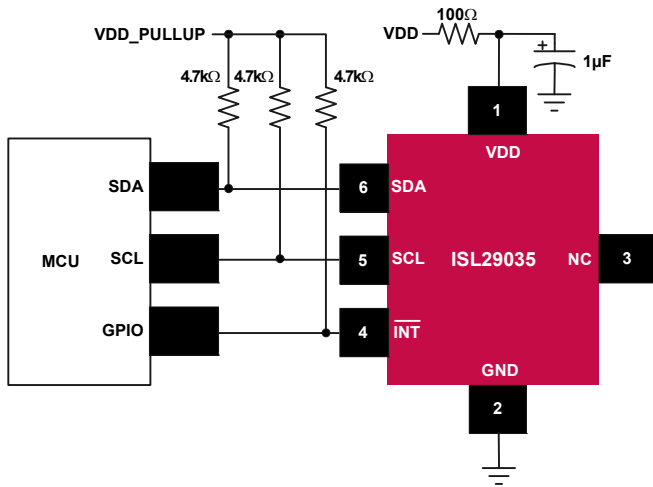


FIGURE 1. ISL29035 TYPICAL APPLICATION DIAGRAM

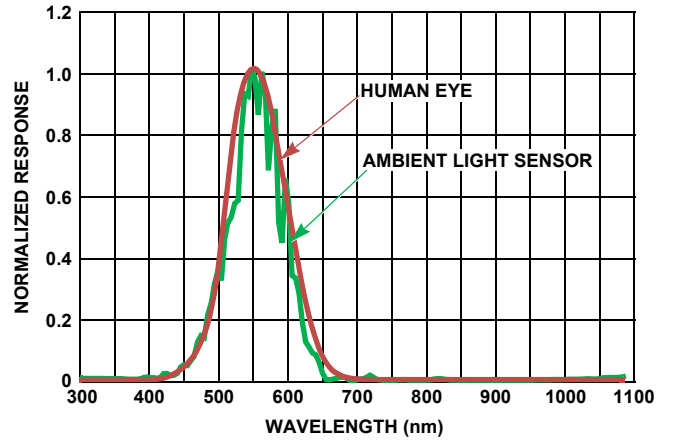


FIGURE 2. NORMALIZED SPECTRAL RESPONSE FOR AMBIENT LIGHT SENSING