

Low Power Ambient Light and Proximity Sensor with Enhanced Infrared Rejection

ISL29147

The ISL29147 is a low power Ambient Light Sensor (ALS) and proximity (PROX) sensor. It has a built-in IR-LED for the proximity function. The ALS function measures the amount of light (in the visible spectrum) incident on the ISL29147.

The ALS function has a programmable ambient IR-rejection, which allows fine tuning of light source variations and is ideal for light sensor applications under dark protective glass. The ALS provides a 12-bit measurement. A passive optical filter removes unwanted wavelengths (IR or Ultraviolet) to ensure accurate ALS measurement.

The proximity function includes a new offset adjustment to compensate for the IR light reflected off the inside of the protective glass cover and back to the ISL29147 sensor. This offset adjustment allows the sensor to compensate for these internal reflections and preserve the dynamic range of the proximity measurement.

The built-in current-driver pulses an external infrared LED at a programmed current for 90µs. The infrared light that is reflected and received by the ISL29147 is digitized by an 8-bit ADC. The proximity sensor also has a passive optical filter designed to pass IR and reject visible wavelengths.

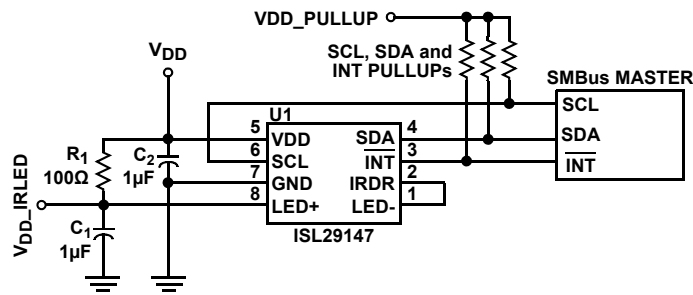
The ISL29147 provides a hardware pin to indicate an interrupt event. The interrupt pin saves power as the host micro-controller can 'wake-up' on an interrupt event and does not need to poll the device for an interrupt event. The interrupt generator is user configurable and provides several options for ALS and PROX trigger configurations. The ISL29147 supports an SMBus compatible I²C interface for configuration and control.

Features

- Internal IR-LED and sensor for a complete solution
- Ideal for applications under dark or tinted glass
- Enhanced ambient sunlight rejection to 40k Lux
- Programmable proximity sleep time between proximity measurements optimizes power consumption
- Hardware interrupt - no polling required
- Programmable IR compensation to fine-tune ALS performance for various glass compositions
- Programmable IR LED drive current to 250mA
- Operates from 2.25V to 3.63V V_{DD}
- Power-down I_{DD}, typical 0.2µA_{DC}
- Tiny 2.40x4x1.2 (mm) optical co-package

Applications

- Display dimming and adjustment
 - Mobile devices: smart phones, PDA, GPS
 - Computing: monitors, laptops, notebooks
 - Picture frames, tablet-PCs, LCD-TV
- Object detection
 - Touchscreen disabling
 - Smart power-saving



R₁: 100Ω 5% RESISTOR
C₁, C₂: 1µF CERAMIC 10V CAPACITOR

FIGURE 1. TYPICAL APPLICATIONS CIRCUIT

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