

Low Power Ambient Light and Proximity Sensor with Internal IR-LED and Digital Output

ISL29044A

The ISL29044A is an integrated ambient and infrared light-to-digital converter with a built-in IR LED and I²C Interface (SMBus Compatible). This device uses two independent ADCs for concurrently measuring ambient light and proximity in parallel. The flexible interrupt scheme is designed for minimal micro-controller utilization.

For ambient light sensor (ALS) data conversions, an ADC converts photodiode current (with a light sensitivity range up to 3200Lux) in 100ms per sample. The ADC rejects 50Hz/60Hz flicker noise caused by artificial light sources.

For proximity sensor (Prox) data conversions, the built-in driver turns on an internal infrared LED and the proximity sensor ADC converts the reflected IR intensity to digital. This ADC rejects ambient IR noise (such as sunlight) and has a 547µs conversion time.

The ISL29044A provides low power operation of ALS and proximity sensing with a typical 133µA normal operation current (108µA for sensors and internal circuitry, ~25µA for LED) with 220mA current pulses for a net 100µs, repeating every 800ms (or under).

The ISL29044A uses both a hardware pin and software bits to indicate an interrupt event has occurred. An ALS interrupt is defined as a measurement that is outside a set window. A proximity interrupt is defined as a measurement over a threshold limit. The user may also require that both ALS/Prox interrupts occur at once, up to 16 times in a row before activating the interrupt pin.

The ISL29044A is designed to operate from 2.25V to 3.63V over the -40°C to +85°C ambient temperature range. It is packaged in a clear, lead-free 8 Ld ODFN package.

Features

- Internal LED + Sensor = complete solution
- Works under all light sources including sunlight
- Dual ADCs measure ALS/Prox concurrently
- <1.0µA Supply current when powered down
- Temperature compensated
- Pb-Free (RoHS compliant)

Intelligent and Flexible Interrupts

- Independent ALS/Prox interrupt thresholds
- Adjustable interrupt persistency
 - 1/4/8/16 consecutive triggers required before interrupt

Applications

- Display and keypad dimming adjustment and proximity sensing for:
 - Mobile devices: Smart phone, PDA, GPS
 - Computing devices: Laptop PC, Netbook, Tablet PC
 - Consumer devices: LCD-TV, digital picture frame, digital camera
 - Industrial and medical light and proximity sensing

Related Literature

- See [AN1436](#), "Proximity Sensors"

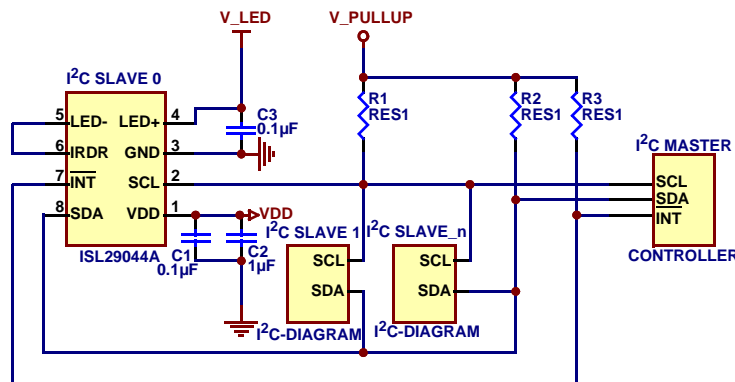


FIGURE 1. TYPICAL APPLICATION

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