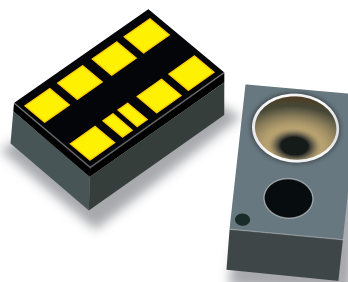


HS3000

Digital Ambient Light & Proximity Sensor with built-in IR LED



Description

The HS3000 combines an advanced digital proximity sensor, IR LED and LED driver with dual ambient light sensors (ALS) and tri-mode I2C interface with interrupt capability in an integrated monolithic device. Multiple power management features and very low active sensing power consumption directly address the power requirements of battery operated mobile phones and mobile internet devices. The proximity sensor measures reflected light intensity with a high degree of precision and excellent ambient light rejection. The HS3000 enables a proximity sensor system with a 32:1 programmable LED drive current range and a 30dB overall proximity detection range. The Dual ambient light sensors include one with a photopic light filter and one with no filter. Both have dark current compensation and high sensitivity eliminating inaccurate light level detection and insuring proper backlight control even in the presence of dark cover glass. The HS3000 is ideal for improving the user experience by enhancing the screen interface with the ability to measure distance for near/far detection in real time and the ability to respond to ambient lighting conditions to control display backlight intensity.

Features

- Proximity sensor, IR LED and dual ALS in a single package.
- Very low power consumption.
 - Stand-by current 5 μ A (monitoring I²C interface only, V_{dd}=3V)
 - ALS operational current 50 μ A per sensor.
 - Proximity sensing average operational current 100 μ A.
 - Average LED sink current 75 μ A.

Proximity Sensing

- Proximity detection distance threshold I²C programmable with 12bit resolution and eight integration time ranges. (16-bit effective resolution)
- Effective for measuring distances up to 100mm and beyond
- Excellent ambient light rejection including sunlight (up to 50K lux) and CFL interference.
- Programmable LED drive current from 5mA to 160mA in 5mA steps, no external resistor required.
- User programmable LED pulse frequency.

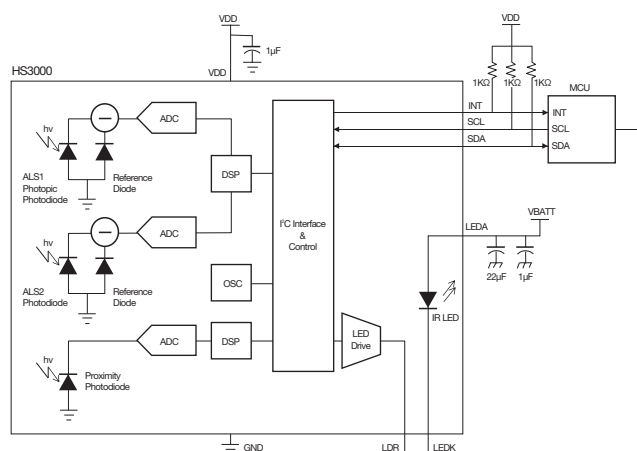
Ambient Light Sensing

- Dual ALS senses ambient light and provides 16-bit output counts on the I²C bus directly proportional to the ambient light intensity.
- Photopic spectral response of ALS1 nearly matches human eye.
- Broadband response of ALS2 supports compensation for spectral shifts encountered with different types of cover glass.
- Dynamic dark current compensation
- Linear response over the full operating range.
- Senses intensity of ambient light from 0.05 lux to 52k lux with 21bit effective resolution. (16-bit converter)
- Continuously programmable integration times. (6.25ms, 12.5ms, 25ms... to 800ms)
- Precision on-chip oscillator. (counts equal 0.1 lux at 100ms integration time)

Additional Features

- Programmable interrupt function including independent upper and lower threshold detection or threshold based hysteresis for proximity and or ALS.
- Level or Edge Triggered interrupts.
- Proximity persistence feature reduces interrupts by providing hysteresis to filter fast transients such as camera flash
- Automatic power down after single measurement or continuous measurements with programmable interval time
- Wide operating voltage range. (2.3V to 3.6V)
- Wide operating temperature range. (-40°C to 80°C)
- I²C serial communication port.
 - Standard mode – 100 kHz
 - Fast mode – 400 kHz
 - High speed mode – 3.4 MHz
- RoHS Compliant (Pb-Free, Halogen Free/BFR Free)
- Moisture Sensitivity Level, MSL3.

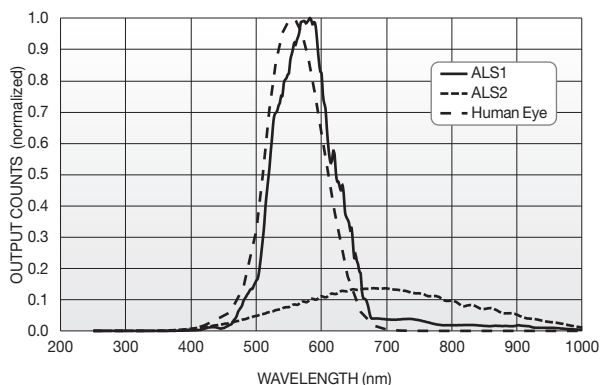
Application Block Diagram



Applications

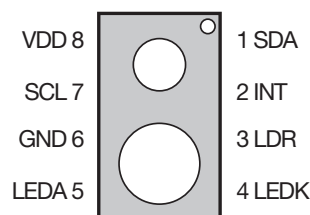
Senses human presence in terms of distance and motion (gestures) and senses ambient light conditions, saving display power in applications such as:

- Smart phones, mobile internet devices, MP3 players, GPS.
- Mobile device displays and backlit keypads.



The Spectral Response of Dual ALS

Package Information



HS3000

- 8 pin DFN Package

Ordering Information

Part No.	Dimensions	Pin count	Packaging	Quantity
HS3000	3.94×2.36×1.35	8	Tape & Reel	2,500