

Product Document

Ambient Light Sensors

www.ams.com/TSL2591



TSL2591 – High Sensitivity Ambient Light Sensor Family

- Industry leading ultra-high sensitivity Ambient Light Sensor to 377 μLux
- Both ultra low light sensitivity and bright sunlight operation
- Patented dual-diode technology that approximates human eye response to light
- Two internal interrupt sources with programmable upper and lower thresholds

We provide innovative analog solutions to the most challenging applications in sensor and sensor interfaces, power management, and wireless.

General Description

The TSL2591 is a highly sensitive light-to-digital converter that transforms light intensity into a digital signal output capable of direct I²C interface. The TSL2591 provides digital ambient light sensing (ALS) based on a patented dual-diode technology that approximates human eye response to light intensity. The ultra-high sensitivity of the TSL2591 enables accurate ALS measurements when exposed to very low light such as when operating behind light attenuating materials. The ultra-high sensitivity, wide dynamic range, and ability to operate in bright sunlight enables the TSL2591 to provide accurate ALS measurements across a wide range of light intensities. The TSL2591 supports a two level interrupt feature that simplifies and improves

system efficiency by eliminating the need to poll a sensor for a light intensity value. The primary purpose of the interrupt function is to detect a meaningful change in light intensity. The concept of a meaningful change can be defined by the user both in terms of light intensity and time, or persistence, of that change in intensity. The TSL2591 provides two internal interrupt sources, each with programmable upper and lower thresholds. One interrupt has a programmable persistence filter to ensure consecutive ALS measurements prior to triggering an interrupt. The second interrupt is triggered if a single ALS measurement exceeds set thresholds for quick response to rapidly changing lighting conditions.

Applications

- Ambient Light Sensing (ALS) for mobile handsets, tablets, notebooks, TVs, and monitors
- Digital signage
- White goods
- Medical and industrial instrumentation
- Keyboard illumination control
- Solid-state and general lighting control
- Printer paper detection

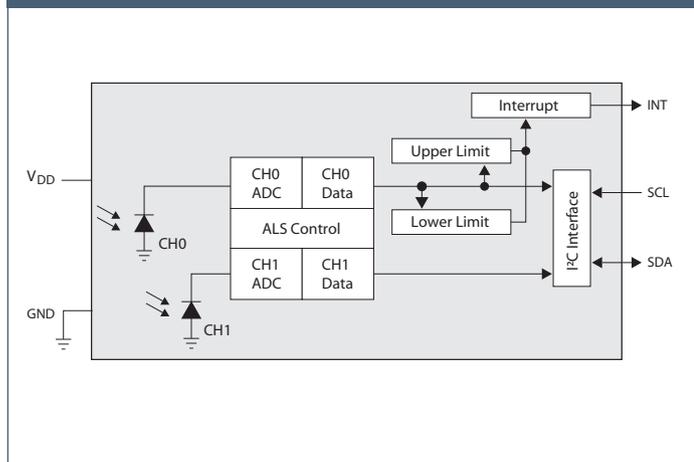
Features

- Industry leading sensitivity – ideally suited for operation behind spectrally distorting material
- Enables low-light (377 uLux) to bright sunlight operation
- Dual Diode:
 - Broadband photodiode – visible & IR light
 - Infrared photodiode – IR light
- Two Integrating analog to digital converters
- Programmable analog gain and integration time
- 600M:1 dynamic range
- Two internal Interrupt sources
- Programmable upper and lower thresholds
- Interrupt includes programmable persistence filter

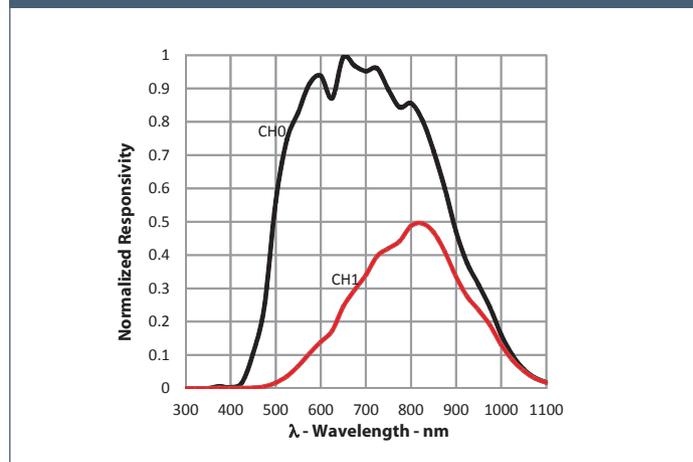
Ordering Number	Package Leads	I ² C Interface	
		Address ¹	Bus Voltage
TLS25911FN	FN-6	0x29	V _{DD}
TSL25913FN	FN-6	0x29	1.8V

¹ Alternate address option available

TSL2591 Block Diagram



Spectral Responsivity



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