Ambient Light Sensors And Proximity Detection
www.ams.com/TSL2740

Thursday, October 12, 2017
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TSL2740 – Ambient Light Sensor Family

- Very high sensitivity behind spectrally distorting materials

- Provides near photopic responsiveness while allowing lux calculation regardless of glass type

- Wide dynamic range enables dark room to sunlight operation

- Improved IR-proximity object detection through offset adjustment registers and automatic ambient light subtraction

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

General Description

The TSL2740 features advanced proximity measurement and very-high sensitivity ambient light sensing that approximates the human eye response to light intensity under varying lighting conditions and transforms this light intensity to a digital signal output capable through a 1.8V I²C interface. Enhanced IR proximity object detection includes offset adjustment registers to compensate for unwanted IR reflected energy at the photodiodes. Proximity results are further improved by automatic ambient light subtraction.

The ALS function features two output channels, a visible channel and an IR channel. The visible channel has a photodiode with a photopic Interferometric UV and IR blocking filter and the IR channel has a photodiode with an IR pass filter. Each channel has a dedicated integrating data converter which converts photodiode current into a 16-bit digital output and its digital output can be interfaced with a microprocessor where illuminance in lux can be derived to accurately measure ambient light to control a displays backlight.
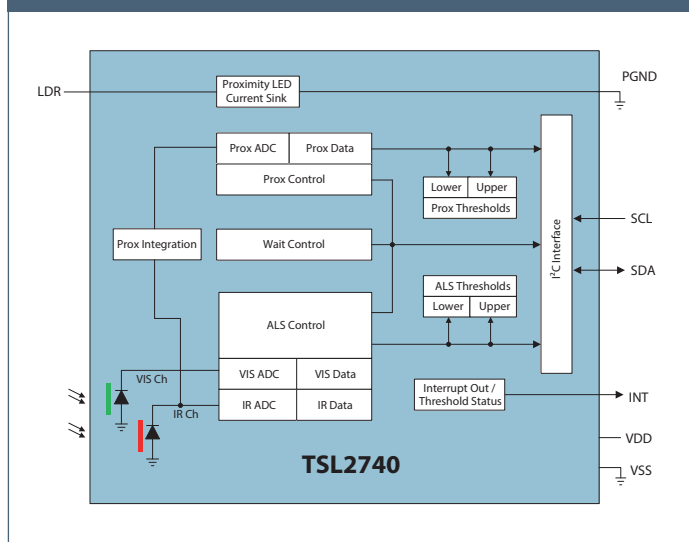
Applications

- Digital home assistants
- Smartwatch wearables
- Display backlight control
- Tablets
- Smartphones
- Medical diagnostics

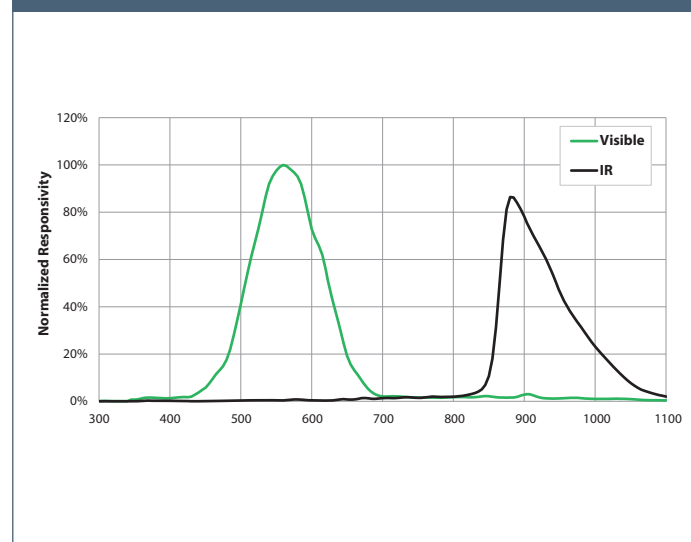| Device	Package	I²C Interface		Ordering Number
		Address	Bus Voltage	
TSL2740	OQFN	0X39	1.8V	TSL27403

Features

- Proximity offset adjustment registers
- Automatic ambient light subtraction
- Integrated on-chip photopic filter
- Programmable analog gain and integration time
- 0.18µm process technology with 1.8V I²C
- 1M:1 Dynamic Range
- Automatic AUTO Zero/Dark Count control
- 5.0 µA Sleep State
- I²C fast-mode compatible interface
  • Data Rates up to 400 kbit/s
- 2.0 mm x 2.0 mm x 0.5mm OQFN package

TSL2740 Block Diagram

TSL2740 Spectral Responsivity