Product Document

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TSL2521

Highly Sensitive Ambient Light Sensor with Selective Flicker Detection and Fast Sampling for Brightness Control or Auxiliary to Camera

General Description

The TSL2521 features ambient light sensing, as well as flicker detection. The device comes in a low-profile and small footprint, L2.0mm x W1.0mm x H0.5mm optical QFN package.

The Ambient Light Sensing function provides two concurrent ambient light sensing channels, which can be arbitrarily connected to the photodiodes via a programmable multiplexer. TSL2521 incorporates a set of Infrared photodiodes and a set of Clear photodiodes. The Clear photodiode area is covered with a UV/IR blocking filter.

This architecture accurately measures ambient light and enables the calculation of irradiance of different light sources. Calculation results help to improve display appearance and picture taking.

The device also integrates direct detection of ambient light flicker. Flicker detection is executed in parallel with ambient light sensing and has independent gain configuration. The flicker detection engine will sample and buffer data for calculating flicker frequencies externally on a host CPU.

Key Benefits & Features

The benefits and features of TSL2521 are listed below:

Figure 1:
Added Value of Using TSL2521

Benefits	Features

• Invisible ALS sensing under any glass type	• Configurable, high sensitivity
	  • Programmable gain and integration time
	  • 8192x dynamic range by gain adjustment only
	  • 1mlux detectable illuminance
	• Tailored ALS response
	  • UV/IR blocking filter for Clear channel
	• ALS interrupt with thresholds

• Unique fast ALS integration mode	• Flicker-immune ALS sensing with programmable integration time

Benefits	Features
• Integrated ambient light flicker detection on chip	• Concurrent flicker and ALS measurement with new simplified readout methodology • Independently configurable sample time and gain • Up to 7kHz flicker detection (14kHz sampling) • FIFO buffer interrupt
• Low power consumption and minimum I^2C traffic	• $1.8V_{DD}$ operation • Configurable sleep mode • Interrupt-driven device • I^2C interface up to 1 Mbit/s (Fast mode) • On chip data compression reduces I^2C serial bus traffic
• Integrated status checking for all functions	• Digital and analog saturation flags

Applications

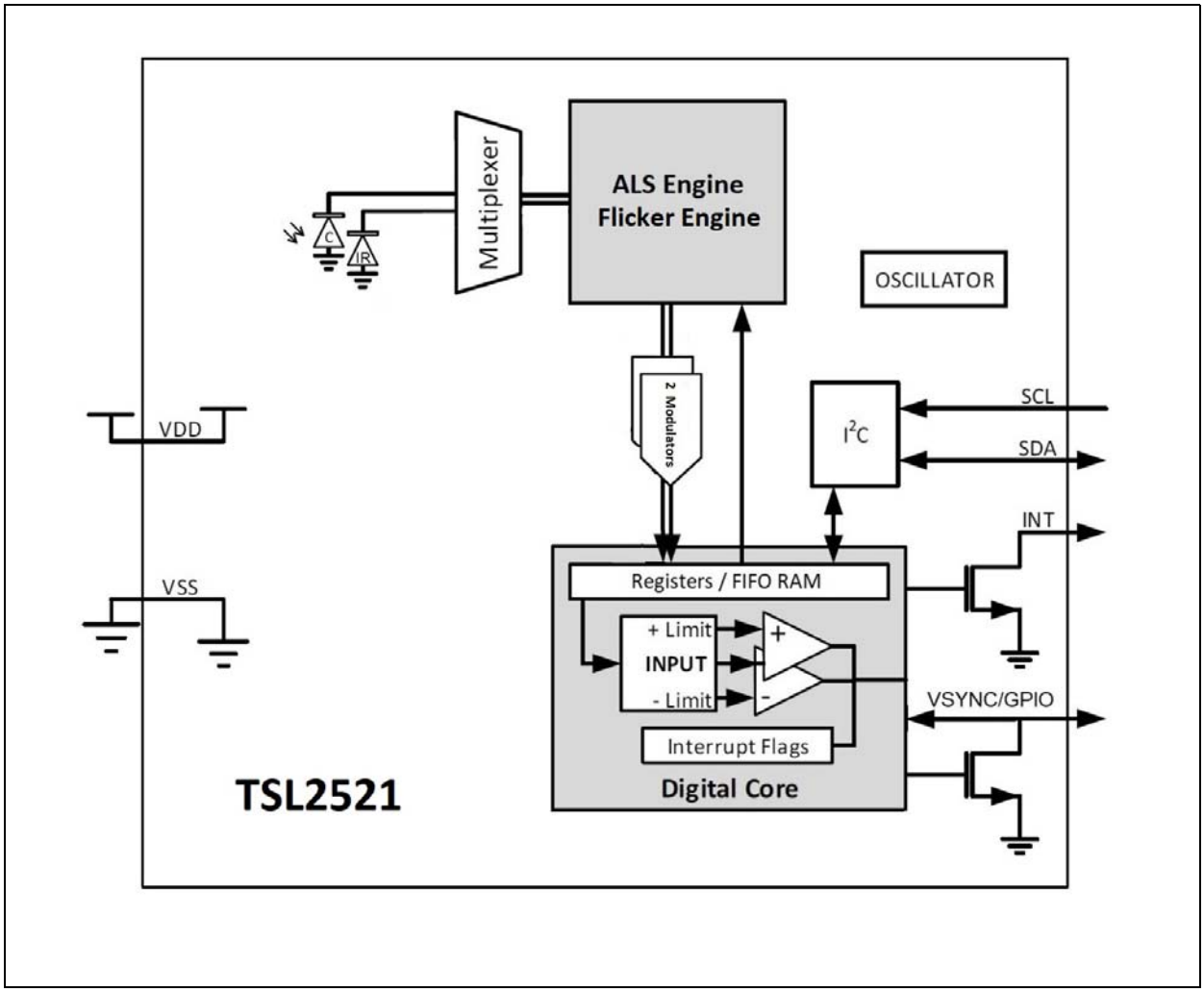
TSL2521 integrates multiple applications within one device. The applications for TSL2521 include:

- Indoor/outdoor brightness information
- Brightness management for displays
- Camera image correction assistance
- Flicker-immune camera operation

Block Diagram

The functional blocks of this device are shown below:

Figure 2:
Functional Blocks of TSL2521



Pin Assignments

Device pinout is described below.

Figure 3:
Pin Diagram of TSL2521 (top view)

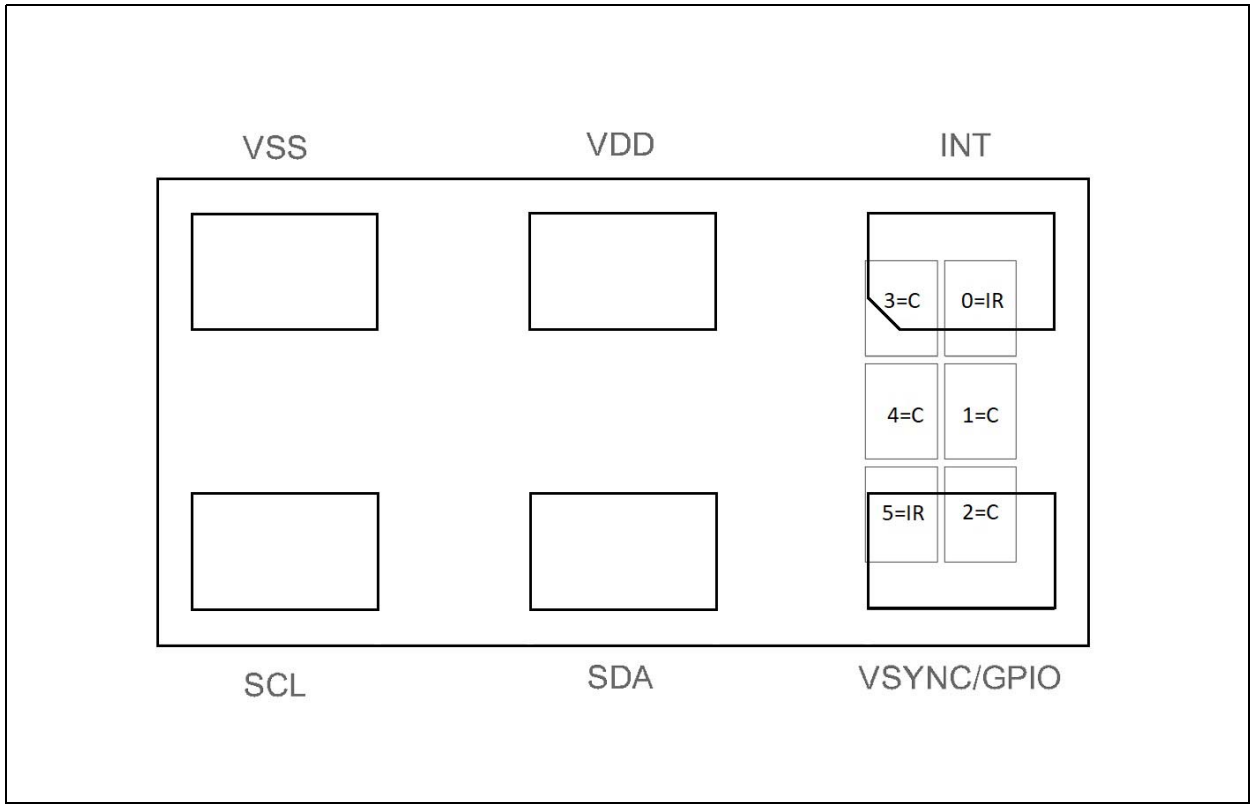


Figure 4:
Pin Description of TSL2521

Pin Number	Pin Name	Description
1	INT	Interrupt. Open-drain output.
2	VDD	Supply voltage (1.8V)
3	VSS	Ground. All voltages are referenced to VSS.
4	SCL	I^2C serial clock terminal
5	SDA	I^2C serial data I/O terminal
6	VSYNC/GPIO	Synchronization input OR General Purpose open-drain Input/Output

Ordering & Contact Information

Figure 5:
Ordering Information

Ordering Code	Address	Interface	Delivery Form	Delivery Quantity
TSL25213	0x39	1.8V I^2C	Tape & Reel	10000 pcs/reel
TSL25213M	0x39	1.8V I^2C	Tape & Reel	1000 pcs/reel

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Revision Information

This short datasheet was derived from v1-01 of full datasheet.