

APDS-9301

Miniature Ambient Light Photo Sensor with Digital (I²C) Output



Data Sheet

Description

The APDS-9301 is Light-to-Digital Ambient Light Photo Sensor that converts light intensity to digital signal output capable of direct I²C interface. Each device consists of one broadband photodiode (visible plus infrared) and one infrared photodiode. Two integrating ADCs convert the photodiode currents to a digital output that represents the irradiance measured on each channel. This digital output can be input to a microprocessor where illuminance (ambient light level) in lux is derived using an empirical formula to approximate the human-eye response.

Application Support Information

The Application Engineering Group is available to assist you with the application design associated with APDS-9301 ambient light photo sensor module. You can contact them through your local sales representatives for additional details.

Features

- Approximate the human-eye response
- Precise Illuminance measurement under diverse lighting conditions
- Programmable Interrupt Function with User-Defined Upper and Lower Threshold Settings
- 16-Bit Digital Output with I²C Fast-Mode at 400 kHz
- Programmable Analog Gain and Integration Time
- Miniature ChipLED Package
 - Height – 0.55mm
 - Length – 2.60mm
 - Width – 2.20mm
- 50/60-Hz Lighting Ripple Rejection
- Typical 3.0V Input Voltage
- Low Active Power (0.6 mW Typical) with Power Down Mode
- RoHS Compliant

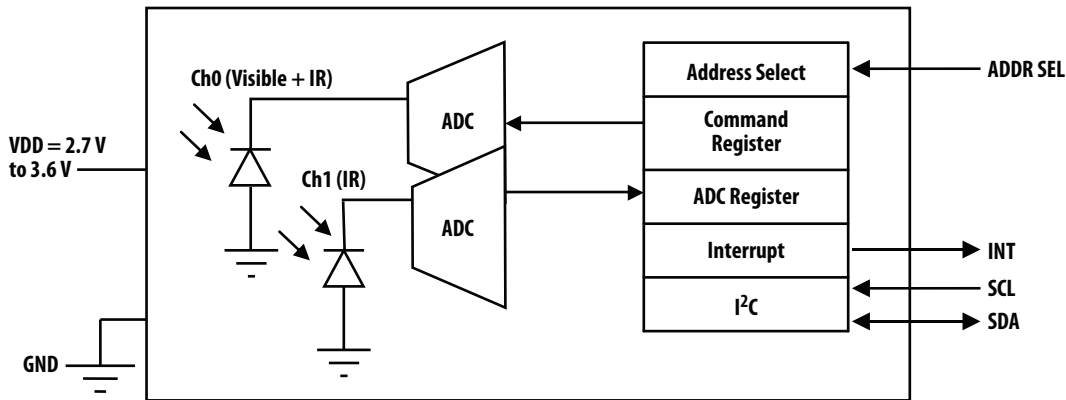
Applications

- Detection of ambient light to control display backlighting
 - Mobile devices – Cell phones, PDAs, PMP
 - Computing devices – Notebooks, Tablet PC, Keyboard
 - Consumer devices – LCD Monitor, Flat-panel TVs, Video Cameras, Digital Still Camera
- Automatic Residential and Commercial Lighting Management
- Automotive instrumentation clusters
- Electronic Signs and Signals

Ordering Information

Part Number	Packaging Type	Package	Quantity
APDS-9301-020	Tape and Reel	6-pins Chipled package	2500

Functional Block Diagram



I/O Pins Configuration Table

Pin	Symbol	Type
1	V _{DD}	Voltage Supply
2	GND	Ground
3	ADDR SEL	Address Select
4	SCL	Serial Clock
5	SDA	Serial Data
6	INT	Interrupt

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage	V _{DD}	–	3.8	V
Digital output voltage range	V _O	-0.5	3.8	V
Digital output current	I _O	-1	20	mA
Storage temperature range	T _{stg}	-40	85	°C
ESD tolerance	human body model	–	2000	V

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Supply Voltage	V _{DD}	2.7	3.0	3.6	V	
Operating Temperature	T _a	-30	–	85	°C	
SCL, SDA input low voltage	V _{IL}	-0.5	–	0.8	V	
SCL, SDA input high voltage	V _{IH}	2.1	–	3.6	V	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Supply current	I _{DD}	–	0.24	0.6	mA	Active
		–	3.2	15	μA	Power down
INT, SDA output low voltage	V _{OL}	0	–	0.4	V	3 mA sink current
		0	–	0.6	V	6 mA sink current
Leakage current	I _{LEAK}	-5	–	5	μA	