

### Data Sheet

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#### Description

The Broadcom APDS-9200 device provides ultra-violet (UV-A and UV-B) sensing and ambient light sensing in a specially designed matrix arrangement for optimization. This allows the device to have optimal angular response for ultra-violet and ambient light sensing. The APDS-9200 converts UV light into digital data and display as UV index (1... >11) with higher values representing higher UV exposures.

The ultra-violet sensing feature is useful in consumer applications for monitoring of UV-A and UV-B radiation as UV radiation is part of the electromagnetic spectrum that reaches the earth from the sun. APDS-9200 is able to measure UV wavelength which has been classified into UV-A (320 nm – 400 nm) and UV-B (290 nm – 320 nm). The ambient light sensing is targeted for display management with the purpose of extending battery life and offers optimum viewing in diverse lightning conditions.

APDS-9200 supports the I<sup>2</sup>C interface and has a programmable interrupt function that frees up micro-controller resources using upper and lower thresholds events.

#### Ordering Information

Part Number	Packaging	Quantity
APDS-9200	Tape and Reel	2500 per reel

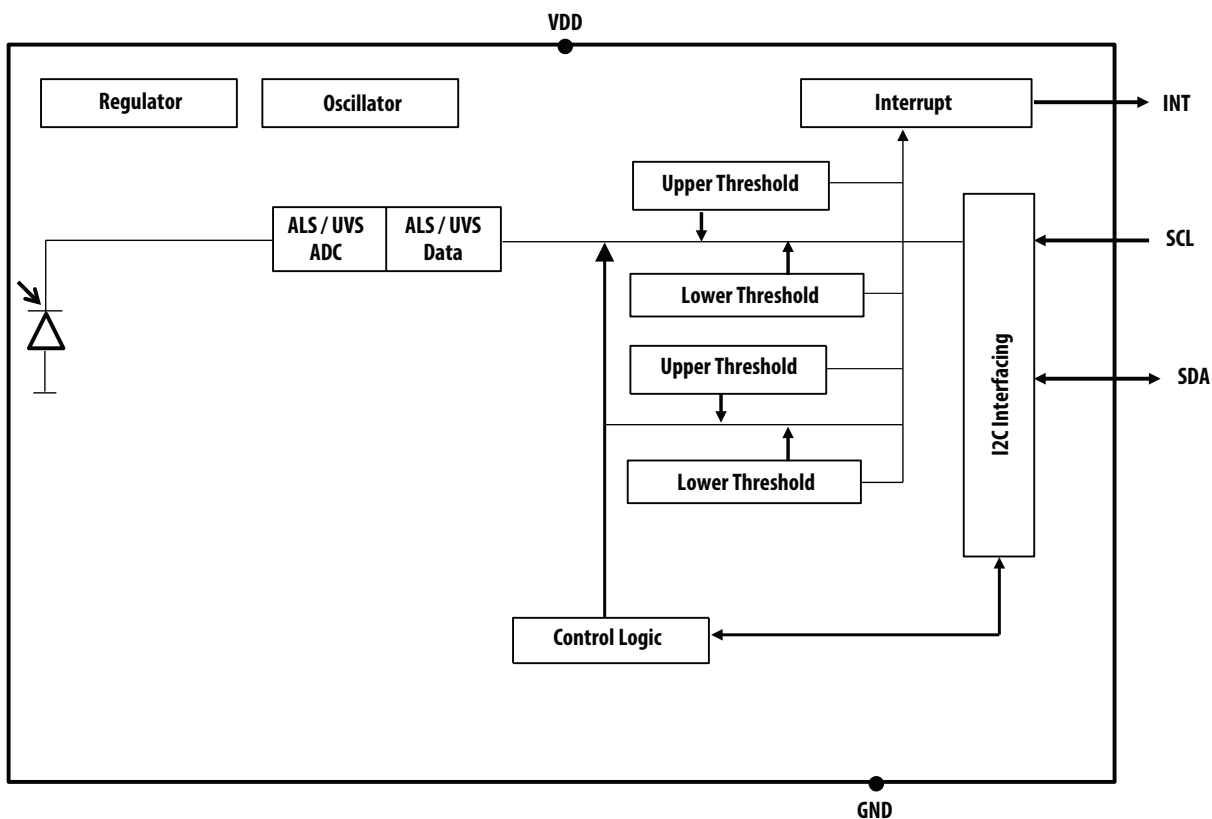
#### Features

- Ultra-Violet (UV-A and UV-B) and ambient light sensing
  - Digital UV Index register (1 ... > 11)
  - Linear output
  - Excellent temperature compensation
- Ambient Light Sensing (ALS)
  - Utilizes coating technology to emulate human eye spectral response (V-Lambda characteristics)
  - High sensitivity in low lux condition – Ideally suited for operation behind dark glass
  - Low lux performance at 0.008 lux
  - Up to 20-bit resolution
- I<sup>2</sup>C Interface Compatible
  - Up to 400 kHz (I<sup>2</sup>C Fast-Mode)
  - Dedicated interrupt pin
- Small package: L 2.0 mm × W 2.0 mm × H 0.65 mm

#### Applications

- Ultra-violet and Ambient Light Sensing
- Mobile devices – cell phones, tablets, outdoor navigation display
- Wearable devices – smart watch, sport watch

Figure 1 Functional Block Diagram



## Detailed Description

The APDS-9200 device contains multiple photodiodes for UV and Ambient Light Sensing as well as temperature compensation that are designed in a matrix placement to achieve optimum angular response at the fall of incident light angle. The photodiode currents are converted to digital count by ADCs. The ADC resolution is selected from 13 bits to 20 bits and the conversion time is inversely proportional to the ADC resolution. The device is connected by an I<sup>2</sup>C interface to a microcontroller through a set of registers. APDS-9200 has a programmable interrupt with hysteresis to respond to events which will reduce the microcontroller tasks with upper and lower thresholds. The device includes a circuit for an internal oscillator, a current source, voltage reference, and internal nonvolatile memory (NVM) to store trimming information.

The UV light sensor has to be operated independently from Ambient Light Sensor. To enable the reading of UV sensor, UVS\_MODE and LS\_EN bit has to be correctly set in the MAIN\_CTRL register. Setting the UVS\_MODE bit will stop a running ALS measurement and start a new UV sensor reading.

Table 1 I/O Pins Configuration

Pin	Name	Type	Description
1	SCL	I	I <sup>2</sup> C serial clock input terminal — clock signal for I2C serial data
2	SDA	I/O	I <sup>2</sup> C serial data I/O terminal – serial data I/O for I2C
3	VDD	Supply	Power Supply Voltage
4	INT	O	Interrupt – Open drain
5	NC		No Connect
6	GND	Ground	Power supply ground. All voltages are referenced to GND