



TSL25911 AMBIENT LIGHT SENSOR

TSL25911 Board User Manual



Purpose of the Document

The purpose of this document is to explain the TSL25911 ambient light sensor board. This document contains the features of TSL25911 sensor board and how to use it to detect ambient light.

Document History

Version	Author	Date	Description
A	5G HUB	06.27.2021	Initial Document

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1 Package Contents

1.1 TSL25911 Sensor board

- TSL25911 sensor board

1.2 Download

Arduino sketches for the TSL25911 can be downloaded from the following website:

<https://github.com/5ghub/5G-NB-IoT/tree/master/KitSketches>

To use the board with Arduino IDE and starts running Arduino projects and sketches, install the following software:

Install Arduino IDE for Windows from the following website:

<https://www.arduino.cc/en/Main/Software>

Download and install Arduino library (**5G-NB-IoT_Arduino.zip**) here:

<https://github.com/5ghub/5G-NB-IoT>

2 Introduction

The TSL25911 ambient light sensor board is a compact board that sense light intensity. The board is based on TSL25911 module which is a highly sensitive light-to-digital converter that transforms light intensity into a digital signal. The board provides digital ambient light sensing (ALS) that approximates human eye response to light intensity. It enables accurate ALS measurements when exposed to very low light such as when operating behind light-attenuating materials. It provides accurate ALS measurements across a wide range of light intensities due to its ultra-high sensitivity, wide dynamic range, and ability to operate in bright sunlight.

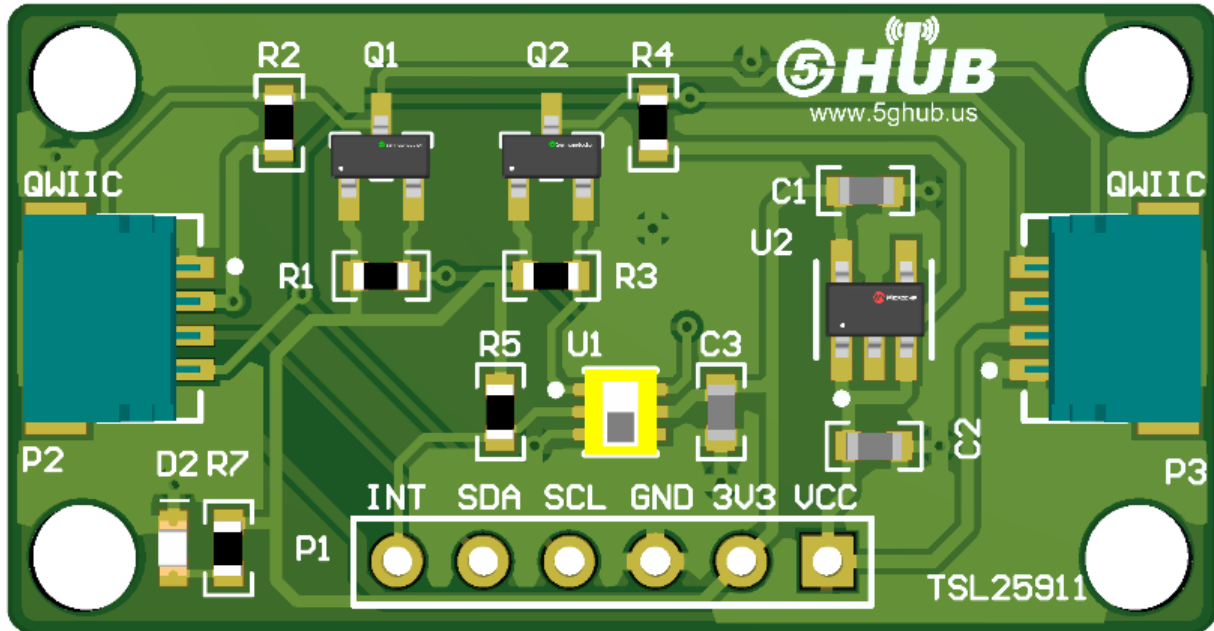
Feature Highlights

- High light-detecting sensitivity which is 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
- Programmable analog gain and integration time
- 600M:1 dynamic range
- Two internal Interrupt sources
- Programmable upper and lower thresholds
- Interrupt includes programmable persistence filter

3 Typical Applications

- Ambient Light Sensing (ALS)
- Digital signage
- White goods
- Medical and industrial instrumentation
- Keyboard illumination control
- Solid-state and general lighting control
- Printer paper detection
- Internet of things

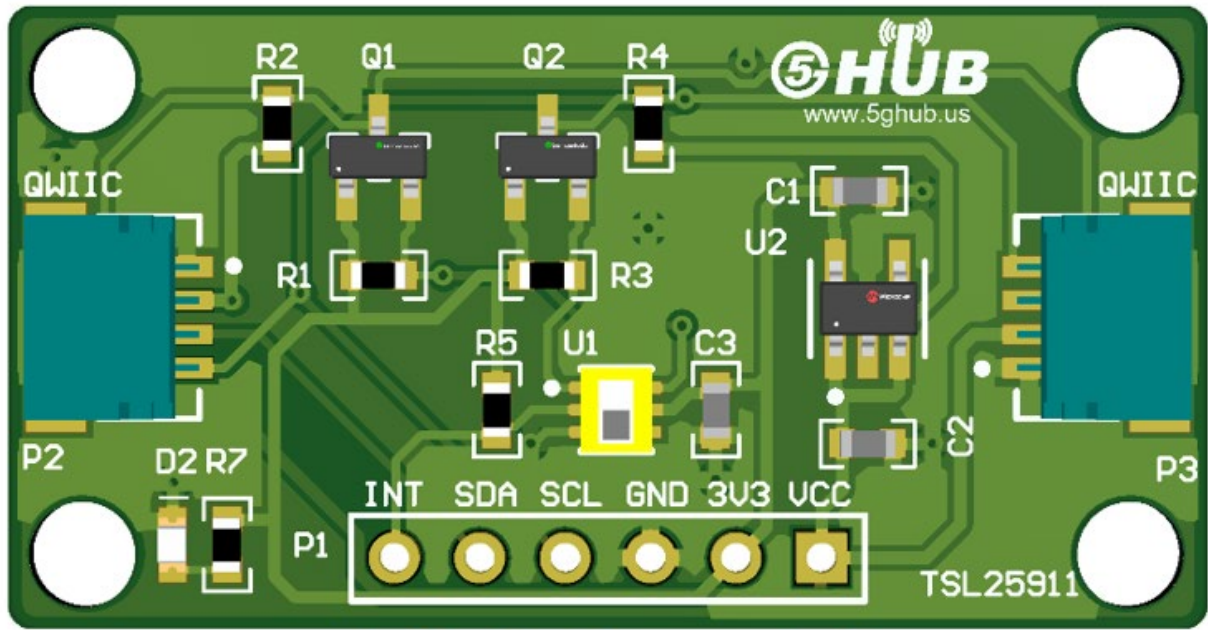
4 Hardware Board and Case Diagram



Pin #	Feature	Description
1	VCC	Input voltage (3.6V-5V)
2	3V3	Output 3.3V
3	GND	Ground
4	SCL	Clock for I2C
5	SDA	Data for I2C
6	INT	Interrupt, Open-drain output (active LOW)

5 Connecting using the I2C

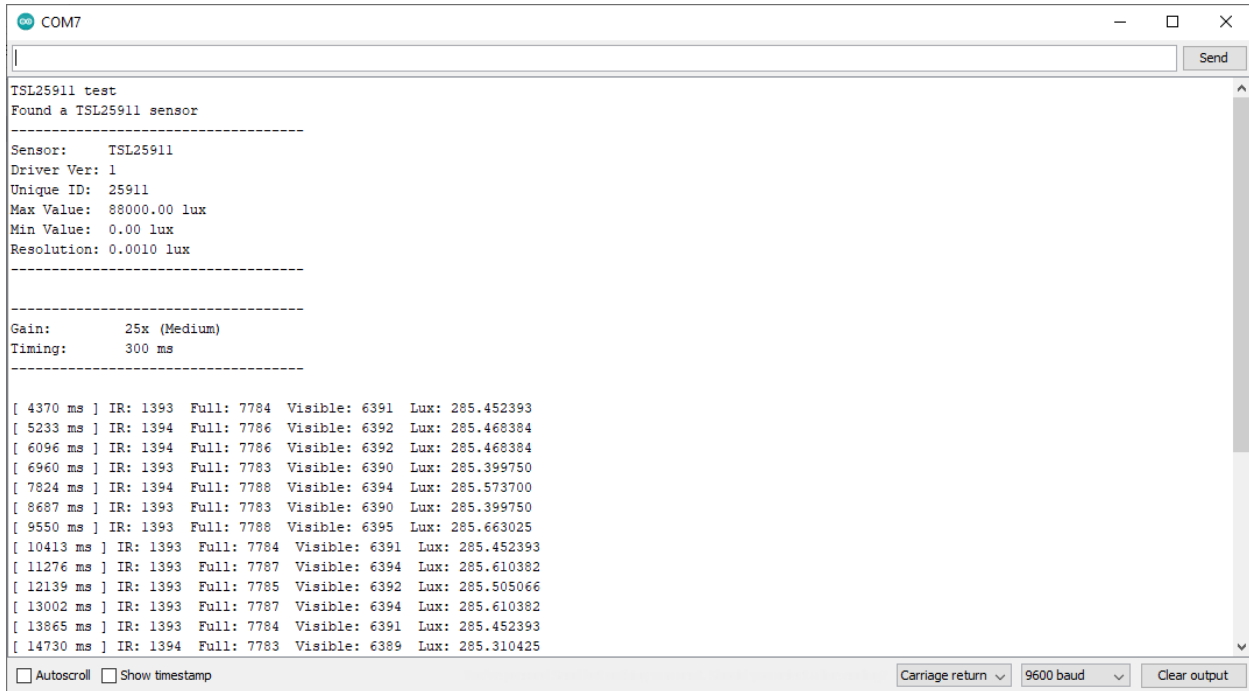
I2C uses only two wires; **SCL** and **SDA**. The sensor board can be interfaced using these two wires only as depicted in this figure. Make sure to connect VCC and GND of the board to a source of 5V and GND.



6 Working with Arduino

The sensor board can work with the [5G NB-IoT board](#) or any other Arduino board. Simply connect VCC and GND to the sensor board and wire the two I2C wires between the Arduino board and sensor board. Run Arduino sketch, and you will see all readings from the TSL25911 ambient light sensor.

The following shows the Arduino sketch for TSL25911 sensor board sensing light.



The screenshot shows a serial terminal window titled 'COM7'. The output text is as follows:

```
TSL25911 test
Found a TSL25911 sensor
-----
Sensor:    TSL25911
Driver Ver: 1
Unique ID: 25911
Max Value: 88000.00 lux
Min Value: 0.00 lux
Resolution: 0.0010 lux
-----

Gain:      25x (Medium)
Timing:    300 ms
-----

[ 4370 ms ] IR: 1393 Full: 7784 Visible: 6391 Lux: 285.452393
[ 5233 ms ] IR: 1394 Full: 7786 Visible: 6392 Lux: 285.468384
[ 6096 ms ] IR: 1394 Full: 7786 Visible: 6392 Lux: 285.468384
[ 6960 ms ] IR: 1393 Full: 7783 Visible: 6390 Lux: 285.399750
[ 7824 ms ] IR: 1394 Full: 7788 Visible: 6394 Lux: 285.573700
[ 8687 ms ] IR: 1393 Full: 7783 Visible: 6390 Lux: 285.399750
[ 9550 ms ] IR: 1393 Full: 7788 Visible: 6395 Lux: 285.663025
[ 10413 ms ] IR: 1393 Full: 7784 Visible: 6391 Lux: 285.452393
[ 11276 ms ] IR: 1393 Full: 7787 Visible: 6394 Lux: 285.610382
[ 12139 ms ] IR: 1393 Full: 7785 Visible: 6392 Lux: 285.505066
[ 13002 ms ] IR: 1393 Full: 7787 Visible: 6394 Lux: 285.610382
[ 13865 ms ] IR: 1393 Full: 7784 Visible: 6391 Lux: 285.452393
[ 14730 ms ] IR: 1394 Full: 7783 Visible: 6389 Lux: 285.310425
```

At the bottom of the window, there are checkboxes for 'Autoscroll' and 'Show timestamp', and dropdown menus for 'Carriage return' and '9600 baud', along with a 'Clear output' button.