# RAK12019 WisBlock UV Sensor Module Datasheet

## Overview

## Description

The RAK12019 is an Ambient Light sensor (ALS) or Ultraviolet Light Sensor (UVS), which is part of the RAKwireless WisBlock sensor series. The measured ambient light intensity and ultraviolet index are interfaced via the I2C bus making it immune to electrical noises, unlike its analog output counterpart. This module utilizes the LTR-390UV-01 sensor from Lite-On.

## Features

- Ambient Light Sensor (ALS) or Ultraviolet Light Sensor (UVS)
- I2C interface capable of Standard mode @100 kHz or Fast mode @400kHz communication 1.8 V logic compatible
- Very low power consumption with sleep mode capability
- 13 to 20 bits effective resolution
- Wide dynamic range of 1:18,000,000 with linear response
- Close to human eye spectral response
- Automatic rejection for 50 Hz/60 Hz lighting flicker
- Operating voltage ranges: 1.7 V to 3.6 V
- Current Consumption: 1 uA - 110 uA
- Chipset: Lite-On LTR-390UV-01
- Operating temperature ranges: -40 to +85 ºC
- Built-in temperature compensation circuit
- Programmable interrupt function for ALS, UVS with upper and lower thresholds
- RoHS and Halogen-free compliant
- Module Size: 10 mm x 10 mm

# Specifications

## Overview

## Mounting

**Figure 1** shows the mounting mechanism of the RAK12019 module on a WisBlock Base board. The RAK12019 module can be mounted on the slots: **C, D, E, & F**.

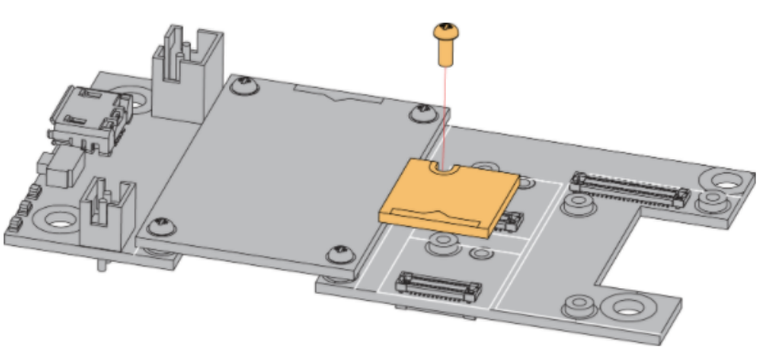

**Figure 1:** RAK12019 WisBlock UV Sensor Mounting

# Hardware

The hardware specification is categorized into five (5) parts. It shows the chipset of the module and the pinouts and their corresponding functions and diagrams. It also covers the electrical and mechanical parameters that include the tabular data of the functionalities and standard values of the RAK12019 WisBlock UV Sensor Module.

# Chipset

| Vendor | Part number |
|---|---|
| Lite-On | LTR-390UV-01 |

# Pin Definition

The RAK12019 WisBlock UV Sensor Module comprises a standard WisBlock connector. The WisBlock connector allows the RAK12019 module to be mounted to a WisBlock Base board. The pin order of the connector and the pinout definition is shown in **Figure 3**.

> 📝 **NOTE**
>
> - **I2C** related pin, **INT** pin, **3V3_S** and **GND** are connected to WisConnector

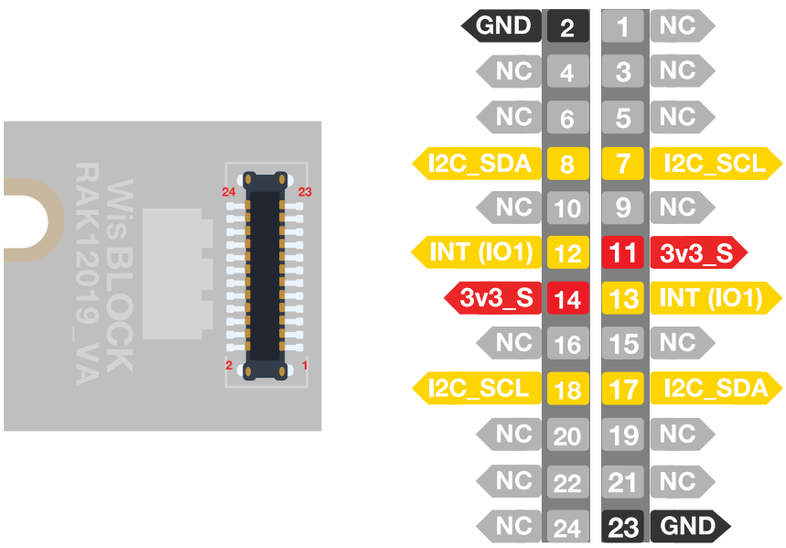


**Figure 2:** RAK12019 WisBlock UV Sensor Pinout

If a 24-pin WisBlock Sensor connector is used, the IO used for the output pulse depends on what slot the module is plugged in. The following table shows the default IO used for different slots:

| SLOT C | SLOT D | SLOT E | SLOT F |
|---|---|---|---|
| WB_IO3 | WB_IO5 | WB_IO4 | WB_IO6 |

# Electrical Characteristics

## Power Supply Ratings

| Symbol | Description | Condition | Min. | Nom. | Max. | Unit |
|---|---|---|---|---|---|---|
| 3V3_S | LTR-390UV-01 Operating Voltage | Input voltage must within this range | 2.5 | 3.3 | 3.6 | V |
| Isd | Shut down current | VDD is 2.8 V | - | 1 | - | uA |
| ALS | ALS Active Mode Current | VMax. duty cycle, Vdd=2.8V, Gain 3x | - | 110 | - | uA |
| UVS | UVS Active Mode Current | Max. duty cycle, Vdd=2.8V | - | 100 | - | uA |
| WakeupTime | Wakeup Time from Standby | From Standby to Active mode where measurement can start | - | 5 | 10 | ms |

# Mechanical Characteristics

## Board Dimensions

**Figure 3** shows the dimensions and the mechanical drawing of the RAK12019 module.

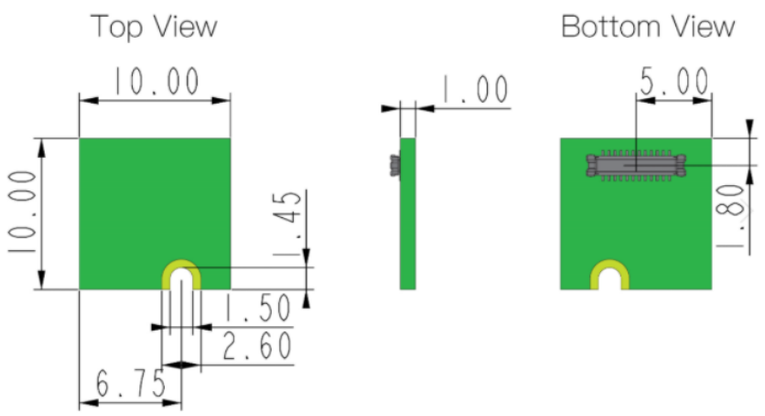


**Figure 3:** RAK12019 WisBlock UV Sensor Dimensions

## WisConnector PCB Layout

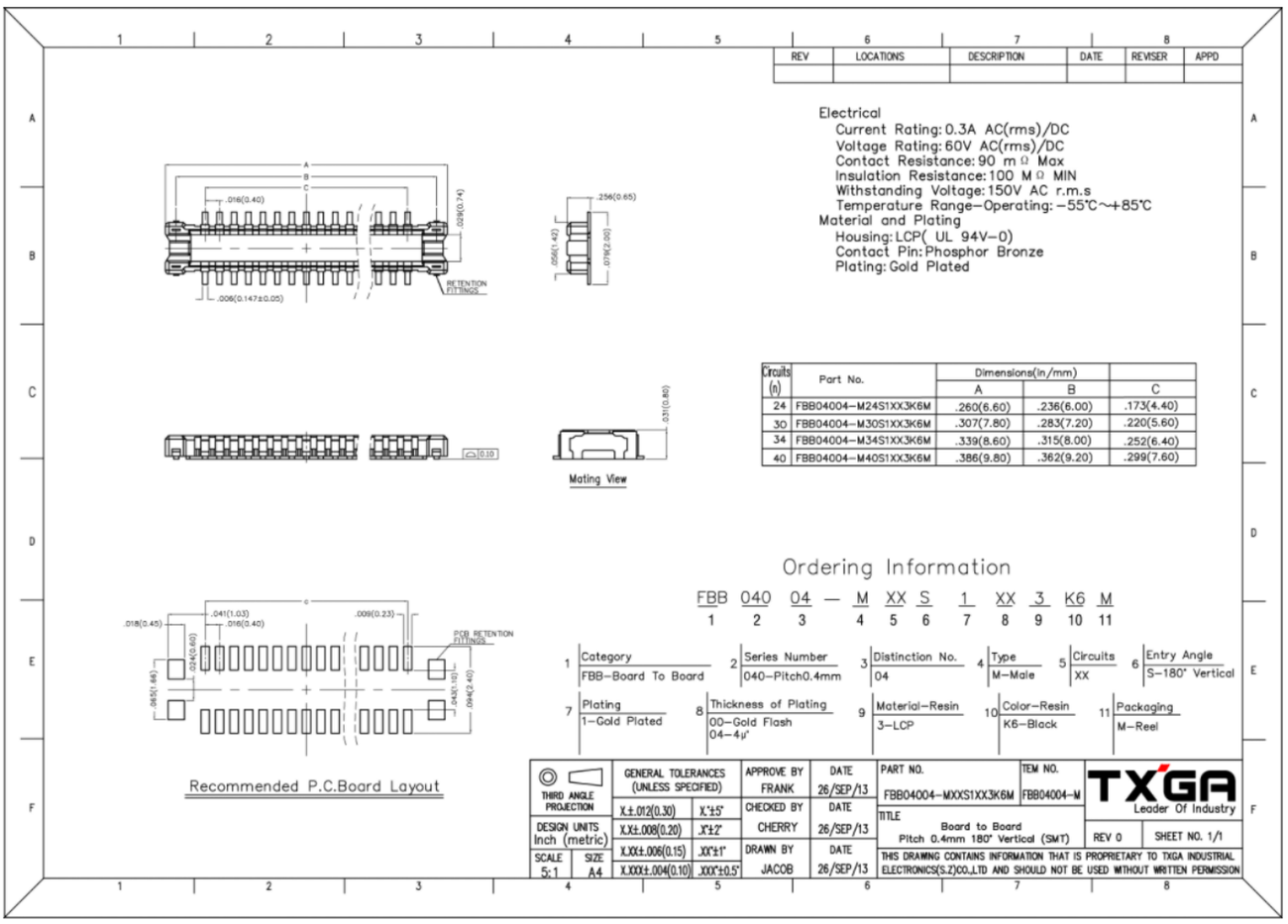


**Figure 4:** WisConnector PCB Footprint and Recommendations

# Schematic Diagram

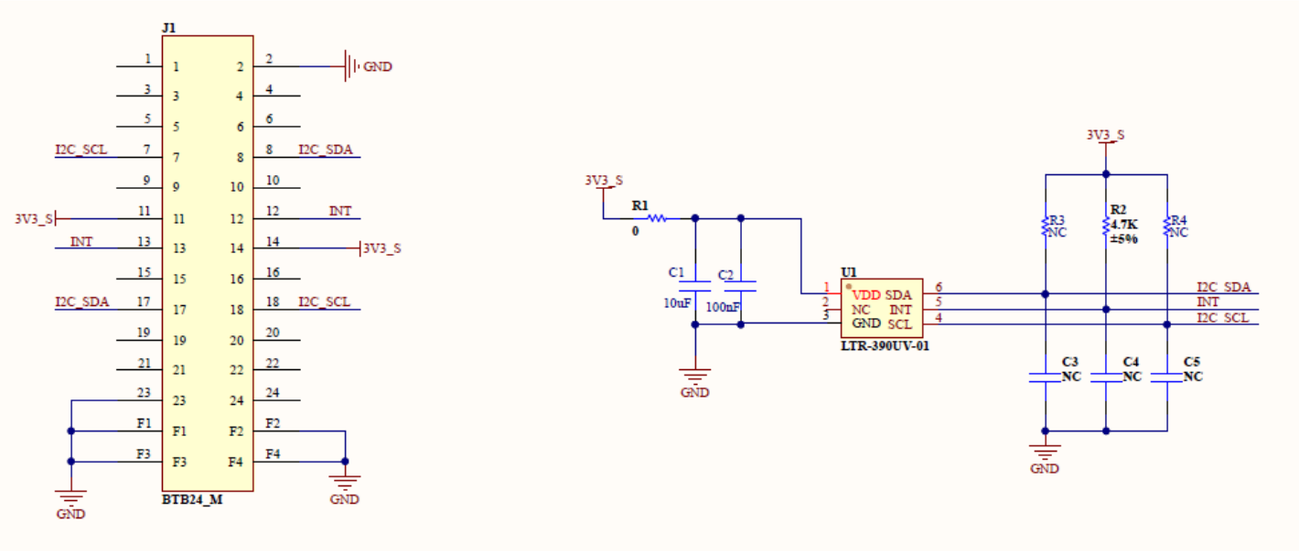


**Figure 5:** RAK12019 WisBlock UV Sensor Schematic Diagram

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