RAK12011 WisBlock Barometer WT Sensor Module Datasheet

Overview

Description

The RAK12011 is a Barometric Pressure sensor module that is part of the RAKWireless WisBlock Sensor series. It uses an LPS33HW MEMS sensor from STMicroelectronics with both barometric pressure and temperature data obtainable via I2C interface. The pressure sensor has a water-resistant package and is combined with the three-proof paint in the RAK12011 PCB. This makes the module ideal on a barometric air pressure data acquisition system even in an environment prone to water exposure.

Features

- Measures Barometric Pressure
- **Operating Pressure Range: 260-1260 hPa**
- **Pressure Sensor Accuracy: ±0.1 hPa**
- Measures Ambient Temperature
- **Operating Temperature Range:** -40 °C to +85 °C
- Embedded Temperature Compensation
- Low current consumption down to 3 µA
- Via I2C interface
- Supply Voltage: 3.3 V
- Current Consumption: 1-15 uA
- Chipset: STMicroelectronics LPS33HW
- **Module size: 10** X 10 mm

Specifications

Overview

Mounting

Figure 1 shows the mounting mechanism of the RAK12011 module on a WisBlock Base board. The RAK12011 module can be mounted on the slots: **A, C, D, E, & F**.

> 📝 **NOTE:**
>
> RAK12011 has one digital output line, so you need one GPIO from WisBlock Core. It means RAK12011 should be used on a sensor slot with one available GPIO. However, WB_IO2 is used to control 3V3_S. Hence, RAK12011 is used only on slots without WB_IO2 like sensor slots A, C to F on WisBlock Base board.

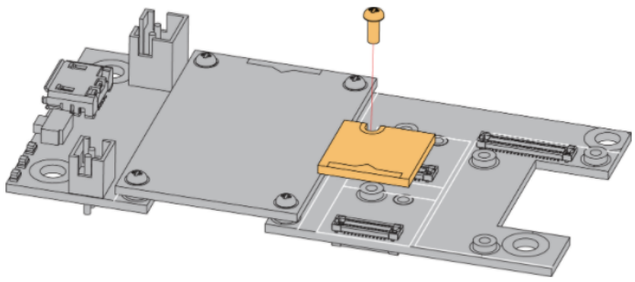

Figure 1: RAK12011 Mounting Mechanism on a WisBlock Base Module

Hardware

The hardware specification is categorized into five parts. It shows the chipset of the module and discusses the pinouts and its 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 RAK12011 WisBlock Barometer WT Sensor Module.

Chipset

Vendor	Part number
STMicroelectronics	LPS33HW

Pin Definition

The RAK12011 WisBlock Fingerprint Sensor comprises a standard WisBlock connector. The WisBlock connector allows the RAK12011 module to be mounted to a WisBlock Base board. The pin order of the connector and the pinout definition is shown in **Figure 2**.

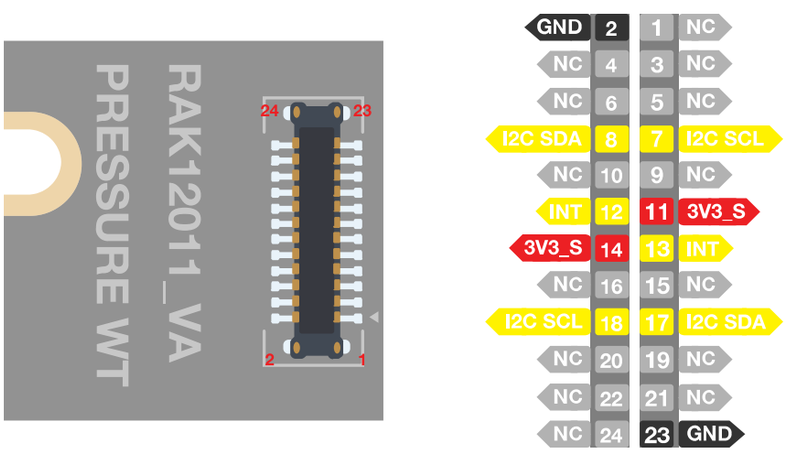

Figure 2: RAK12011 Pinout Diagram

📝 **NOTE**

- Only **I2C** related pins, **INT**, **3V3_S**, and **GND** are connected to the WisConnector on this module.
- **3V3_S** voltage output from the WisBlock Base that powers the RAK12011 module can be controlled by the WisBlock Core via WB_IO2 (WisBlock IO2 pin). This makes the module ideal for low-power IoT projects since the WisBlock Core can totally disconnect the power of the RAK12011 module.
- RAK12011 can work in a wet environment, but the WisBlock Base board is not water-resistant. You can use an extension cable like the RAK19005 FPC Cable to position your RAK12011 sensor apart from the WisBlock Base module.

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:

The table below shows the default IOs used for different slots using INT:

SLOT A	SLOT C	SLOT D	SLOT E	SLOT F
WB_IO1	WB_IO3	WB_IO5	WB_IO4	WB_IO6

Electrical Characteristics

This section shows the maximum and minimum ratings of the RAK12011 module and its recommended operating conditions. Refer to the table presented below.

Absolute Maximum Ratings

Parameter	Minimum	Maximum	Unit
3V3_S	-0.3	4.8	V
P(air)	-	2	MPa
TSTG	-40	125	°C
ESD	-	2 (HBM)	KV

Power Supply Ratings

Symbol	Description	Condition	Min.	Nom.	Max.	Unit
VDD	Supply voltage	Normal work	1.7	3.3	3.6	V
IDD1	Supply current	@ ODR 1 Hz LC_EN bit = 0 at 1.8 V	-	15	-	uA
IDD2	Supply current	@ ODR 1 Hz LC_EN bit = 1	-	3	-	uA
IDD3	Supply current	Power-Down Mode	-	1	-	uA

Mechanical Characteristics

Board Dimensions

Figure 3 shows the mechanical dimensions of the RAK12011 module.

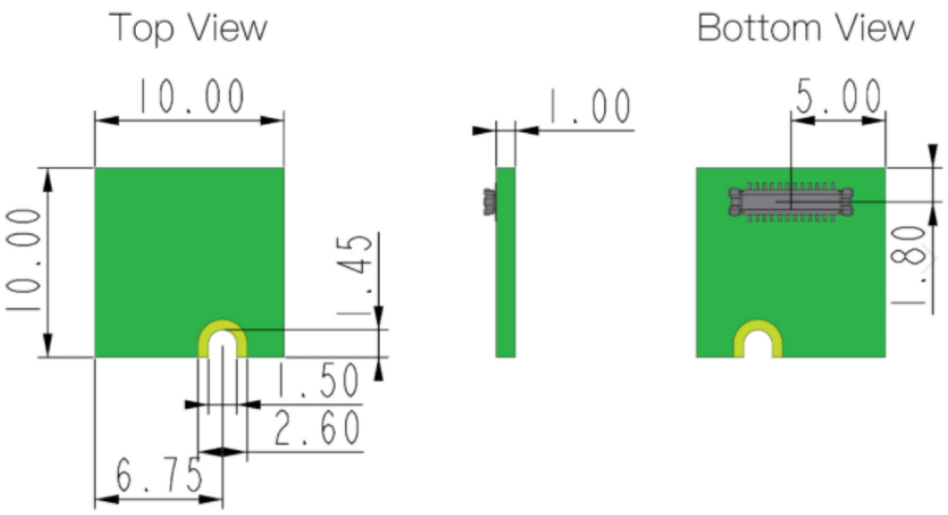

Figure 3: RAK12011 Mechanical Dimensions

WisConnector PCB Layout

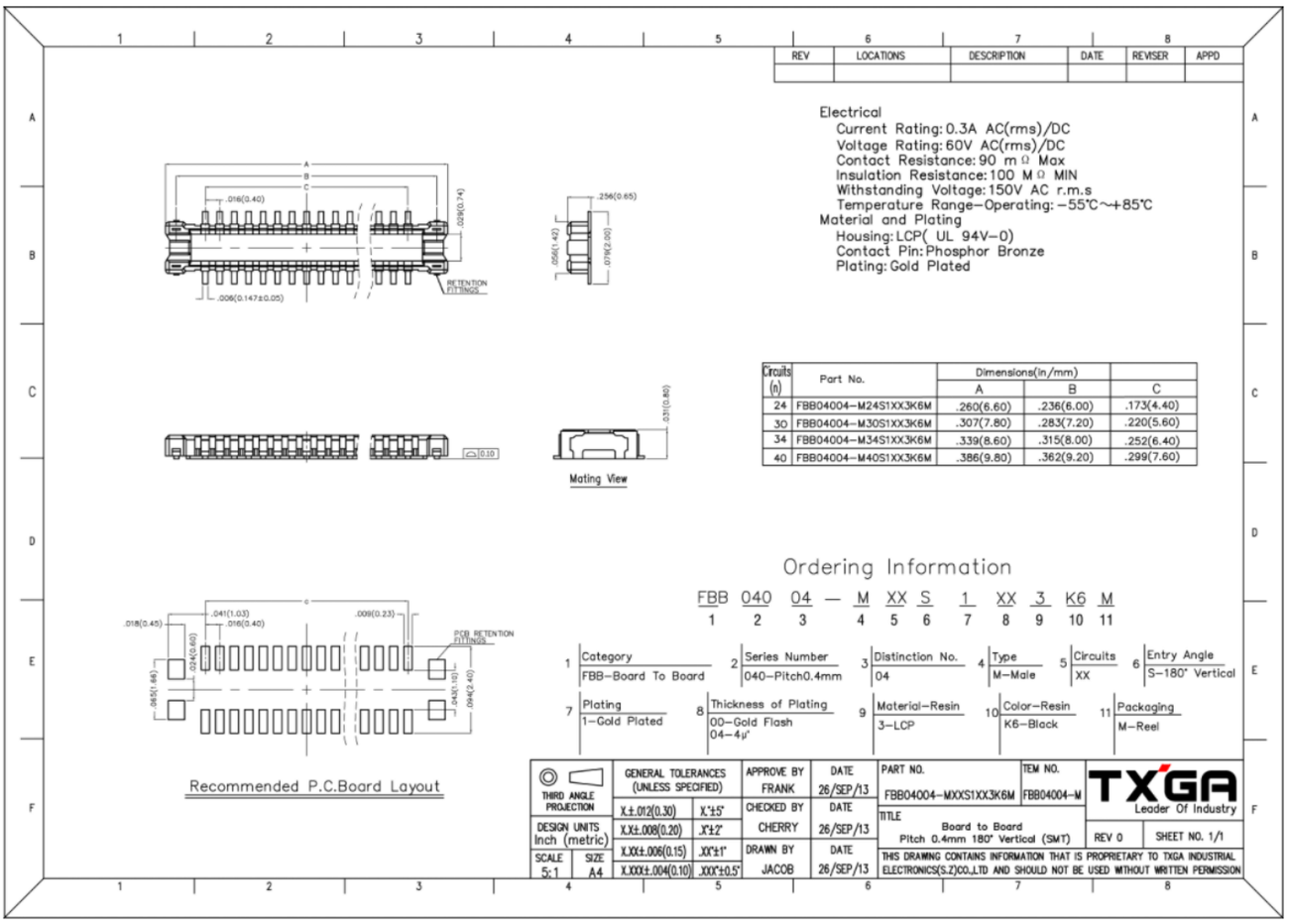

Figure 4: WisConnector PCB Footprint and Recommendations

Schematic Diagram

Figure 5 shows the schematic of the RAK12011 module.

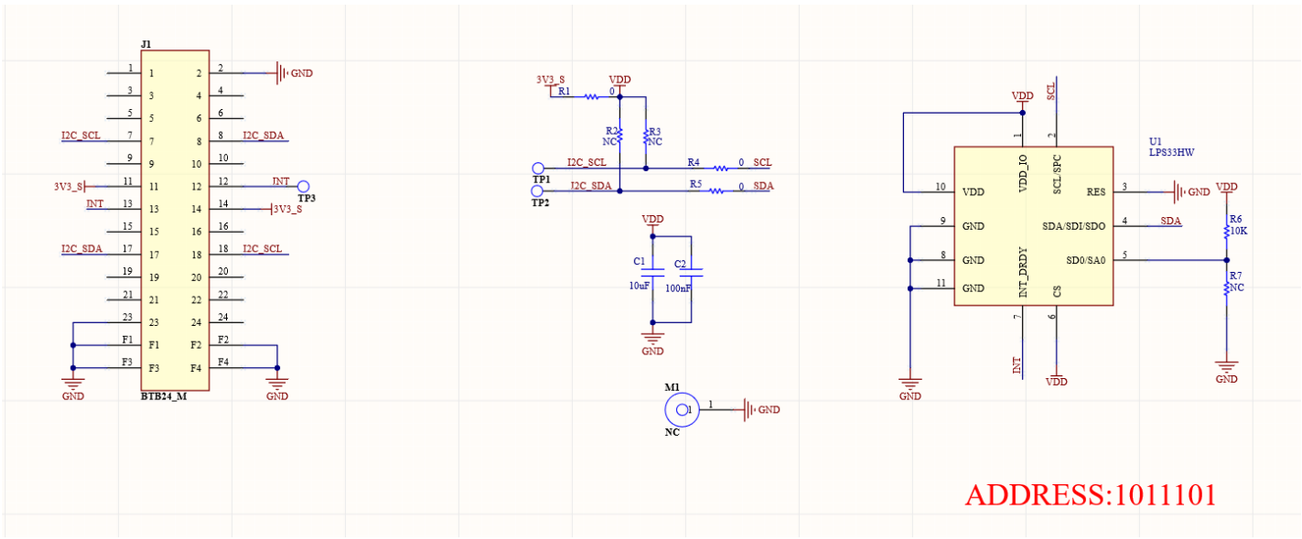

Figure 5: RAK12011 WisBlock Module Schematics

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