RAK1910 WisBlock GNSS Location Module Datasheet

Overview

Description

The RAK1910 WisBlock GNSS Location Module module, part of the RAK Wireless Wisblock series, is a u-blox MAX-7Q GNSS (GPS, GLONASS, QZSS, and SBAS) module. This module features exceptional performance, high sensitivity, and minimal acquisition time which makes it suitable for low-power IoT solutions. The RAK1910 positioning module is a GNSS receiver. It receives and tracks the GPS (including SBAS and QZSS) and the GLONASS signals. QZSS and SBAS signals (by default) can be received concurrently with GPS signals.

Features

- High accuracy of 2.5m
- **Update rate**: 10 Hz
- **Velocity accuracy**: 0.1 m/s
- **Heading accuracy**: 0.5 degrees
- Fast location fix. 29 s from cold start to first fix. 1 s from hot start
- GPS and GLONASS satellite support
- **Module size**: 10 x 23mm

Specifications

Overview

Mounting

The RAK1910 module can be mounted only in slot A of the WisBase board. Figure 1 shows the mounting mechanism of the RAK1910 on a WisBase module, such as the RAK5005-O.

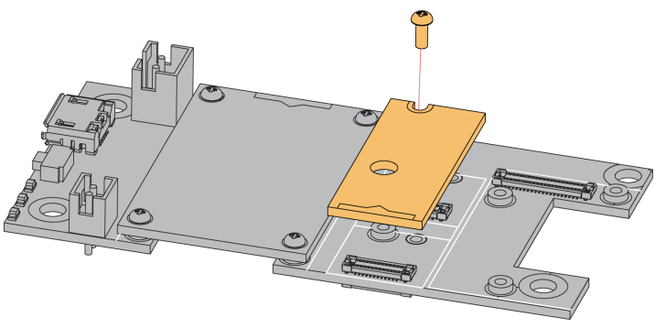


Figure 1: RAK1910 WisBlock GNSS Location Module Mounting

Hardware

Chipset

Vendor	Part number
uBlox	MAX-7Q

Pin Definition

The RAK1910 WisBlock GNSS Location Module module comprises a standard WisIO connector. The WisIO connector allows the RAK1910 module to be mounted on a WisBlock baseboard, such as RAK5005. The pin order of the connector and the definition of the pinout are shown in Figure 2.

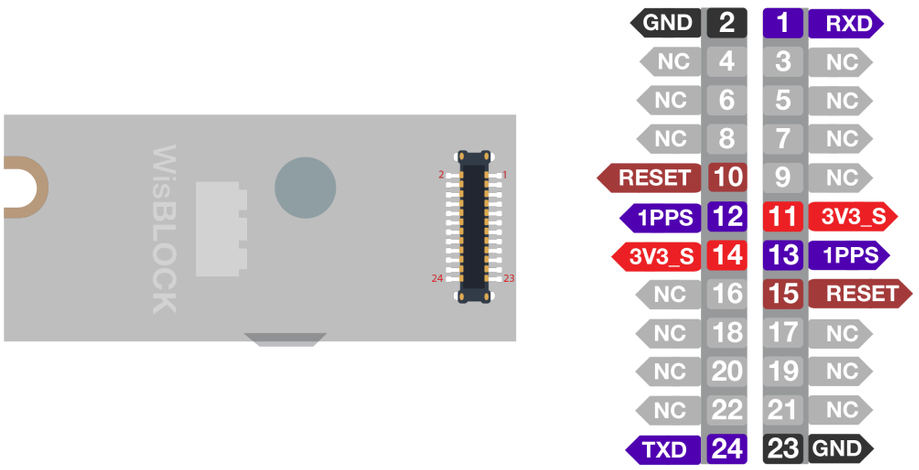


Figure 2: RAK1910 WisBlock GNSS Location Module Pinout Diagram

> 📝 **NOTE**
>
> - Only the **UART** related pin, **1PPS** pin, **RESET** pin, **VDD,** and **GRD** are connected to this module.
> - The RAK1910 module can be installed in the Slot A only

Sensors

GNSS Sensor

Parameter	Specification		
Receiver Type	56 Channels u-blox 7 engine		
	GPS/QZSS L1C/A		
	SBAS: WAAS, EGNOS, MSAS		
Time-To -First-Fix		MAX-7QW	MAX-7C
	Cold Start	29s	30s
	Warm Start	28s	28s
	Hot Start	1s	1s
	Aided Starts	5s	5s
Sensitivity		MAX-7QW	MAX-7C
	Tracking & Navigation	-161 dBm	-160 dBm
	Reacquisition	-160 dBm	-160 dBm
	Cold Start	-148 dBm	-147 dBm
	Warm Start	-148 dBm	-148 dBm
	Hot Start	-156 dBm	-155 dBm
Horizontal Position Accuracy	Autonomous	2.5m	
	SBAS	2.0m	

Electrical Characteristics

Recommended Operating Conditions

Symbol	Description	Min.	Nom.	Max.	Unit
V_{DD}	Power supply for the module	2.7	3.0	3.6	V
I_{BCKP}	Backup battery current	-	15	-	uA
I_{cc}	Acquisition	-	22	-	mA
I_{cc}	Tracking	-	17.5	-	mA

Mechanical Characteristics

Board Dimensions

Figure 3 shows the dimensions and the mechanic drawing of the RAK1910 module.

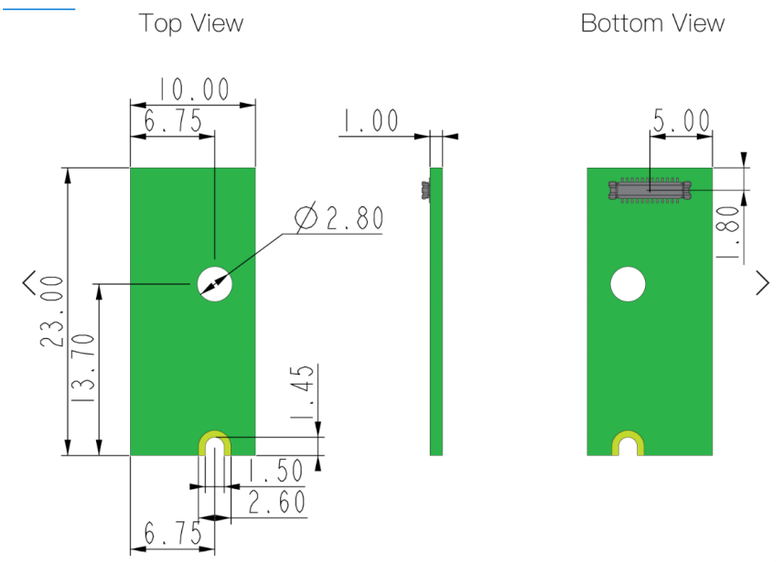
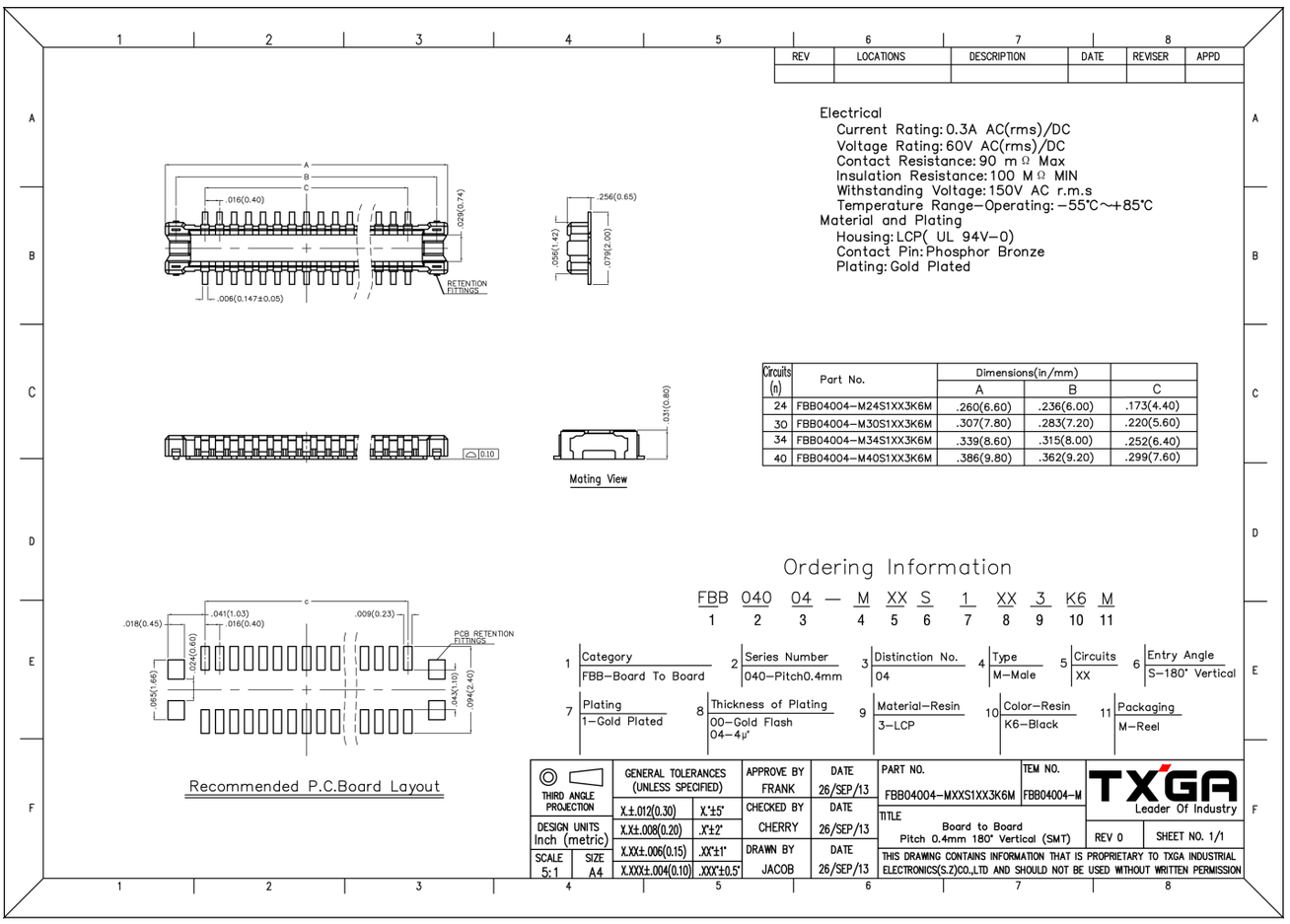


Figure 3: RAK1910 WisBlock GNSS Location Module Mechanic Drawing

> 📝 **NOTE:**
>
> Slot for mounting: **Slot A**
>
> 1. Because the RAK1910 is double in size and uses the Serial connection to the WisBlock Core module, it can be only installed in the RAK5005-O Slot A.

WisConnector PCB Layout



Circuits (n)	Part No.	Dimensions(in/mm) A	B	C
24	FBB04004—M24S1XX3K6M	.260(6.60)	.236(6.00)	.173(4.40)
30	FBB04004—M30S1XX3K6M	.307(7.80)	.283(7.20)	.220(5.60)
34	FBB04004—M34S1XX3K6M	.339(8.60)	.315(8.00)	.252(6.40)
40	FBB04004—M40S1XX3K6M	.386(9.80)	.362(9.20)	.299(7.60)

Figure 4: WisConnector PCB footprint and recommendations

Schematic Diagram

The Figure 5 shows the schematic of the RAK1910 module.

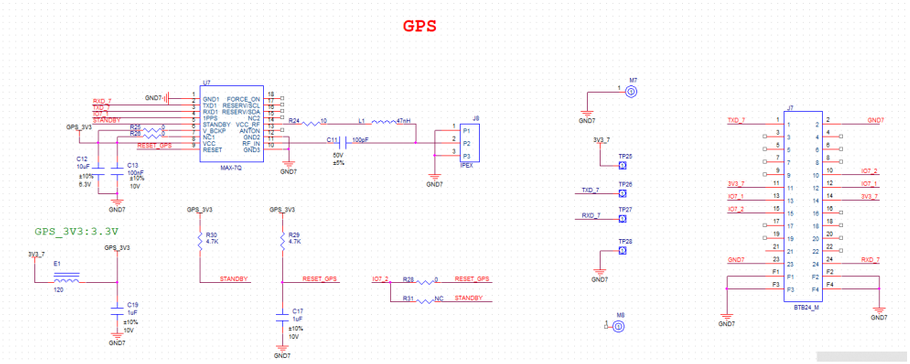


Figure 5: RAK1910 WisBlock GNSS Location Module Schematics

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