RAK14004 WisBlock Keypad Module Datasheet

Overview

Description

RAK14004 WisBlock Keypad Module was designed to be part of a production-ready IoT solution in a modular way and must be combined with a **WisBlock Core** and a **WisBlock Base** module.

The RAK14004 module is designed as an IO extension module that allows to add a keypad and create a customized IoT solution. This module can be used in conjunction with RAK14009, RAK14010, or RAK14011 keypad modules.

Features

- **Module Specifications**
  - Up to 8 x 8 buttons using scan matrix arrangement
  - 3.3 V Power supply
  - Chipset: Microchip ATMEGA328PB-AU
- **Size**
  - 35 mm x 25 mm

Specifications

Overview

Figure 1 and **Figure 2** show the RAK14004 top and bottom view of the RAK14004 module.

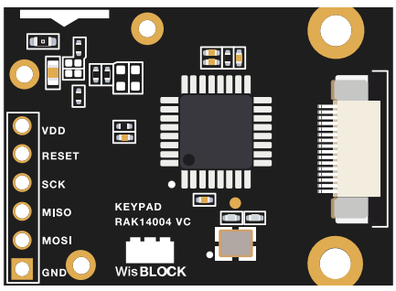

Figure 1: RAK14004 top view

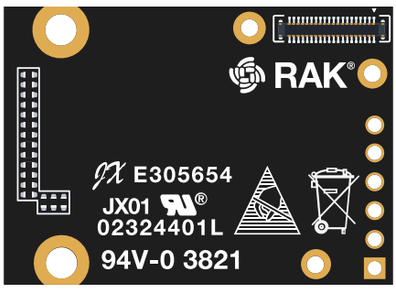

Figure 2: RAK14004 bottom view

Mounting

The RAK14004 module can be mounted on the IO slot of the WisBlock Base board. **Figure 3** shows the mounting mechanism of the RAK14004 on a WisBlock Base module, such as a RAK5005-O.

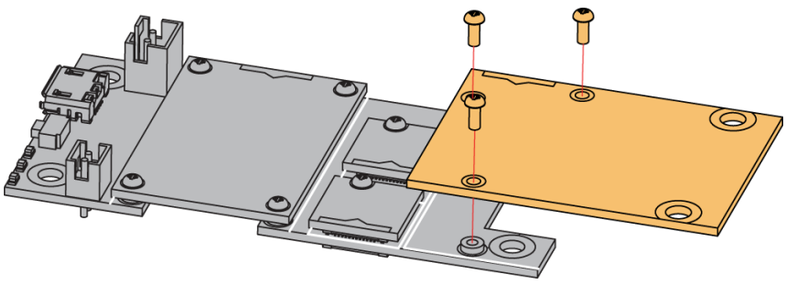

Figure 3: RAK14004 mounting mechanism on a WisBlock Base module

Hardware

The hardware specification is categorized into five parts. It shows the chipset of the module and discusses the pinouts and 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 RAK14004 WisBlock Keypad Module.

Chipset

Vendor	Part number
Microchip	ATMEGA328PB-AU

Pin Definition

The RAK14004 comprises a standard WisBlock IO 40-pin connector. The WisBlock IO connector allows the RAK14004 module to be mounted on a WisBlock Base Board, such as RAK5005-O. The pin order of the connector and the pinout definition is shown in **Figure 4**.

> 📝 **NOTE:**
>
> **I2C** related pins, **UART** related pins, **INT**, **RESET**, **3V3**, and **GND** are connected to 40-pin WisBlock IO connector.

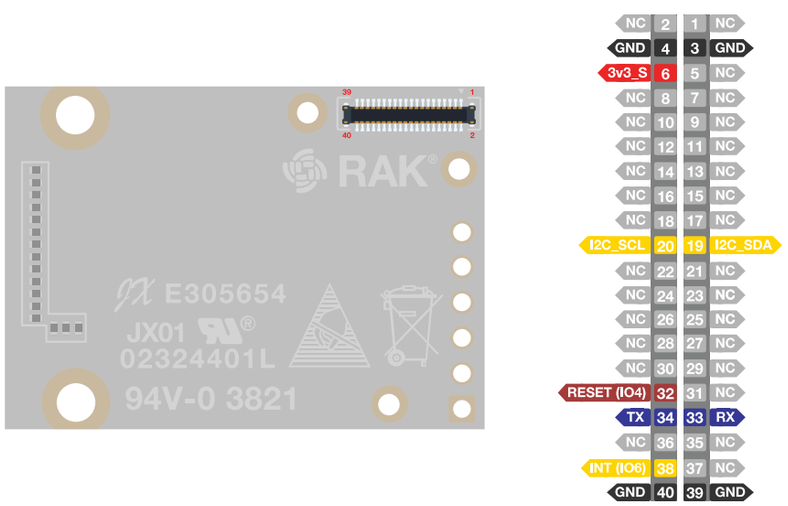

Figure 4: RAK14004 Pin Definition

Electrical Characteristics

Power Supply Ratings

Symbol	Description	Min.	Nom.	Max.	Unit
VDD	Power supply	1.8	3.3	5.5	V

Mechanical Characteristics

Board Dimensions

Figure 5 shows the dimensions and the mechanic drawing of the RAK14004 module.

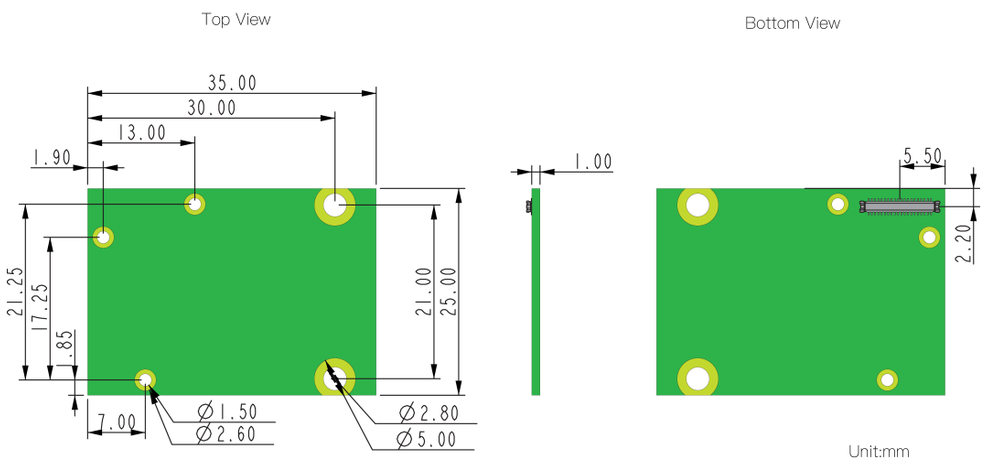

Figure 5: RAK14004 Mechanical Dimensions

WisConnector PCB Layout

WisConnector PCB footprint and recommendations

Figure 6: WisConnector PCB footprint and recommendations

Schematic Diagram

The RAK14004 uses a Microchip ATMEGA328PB-AU microcontroller for matrix keyboard scanning and identification. A cable is used to connect RAK14004 to keypad modules such as RAK14009.

MCU Schematic

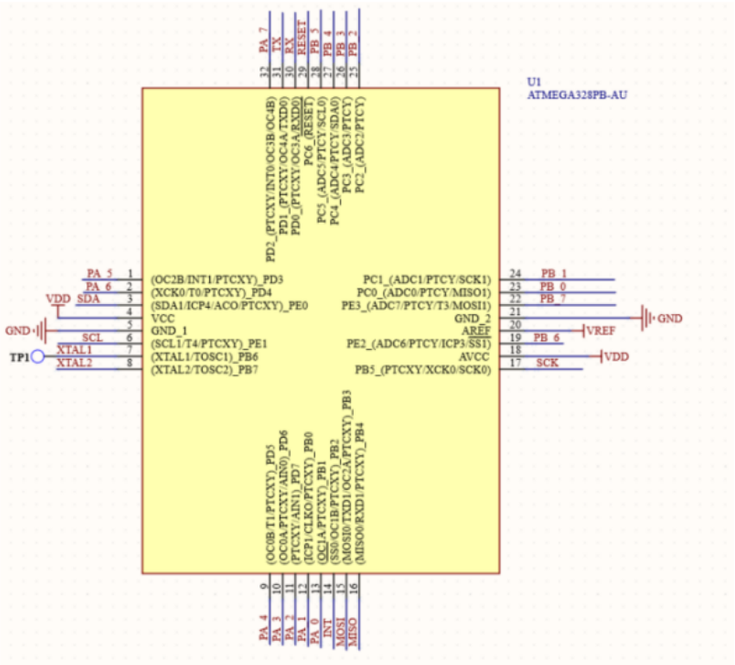

Figure 7: MCU schematic

I2C Pull Up Resistor

The I2C Pull Up Resistor already exists on WisBlock Base Board. **R7** and **R8** are not mounted on the RAK14004 module.

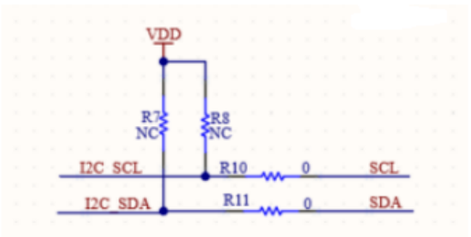

Figure 8: I2C Pull Up Resistor

MCU Debug

J3 is the MCU debug connector.

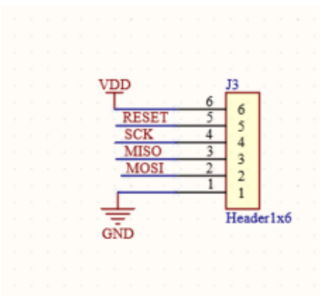

Figure 9: MCU Debug connector

> ⚠ **WARNING**
>
> Do not connect to this header or you lose the warranty and your RAK14004 will not work anymore.

Matrix Buttons Module Connector

J2 Matrix Buttons connector is used to connect RAK14004 to keypad modules such as RAK14009, RAK14010, and RAK14011.

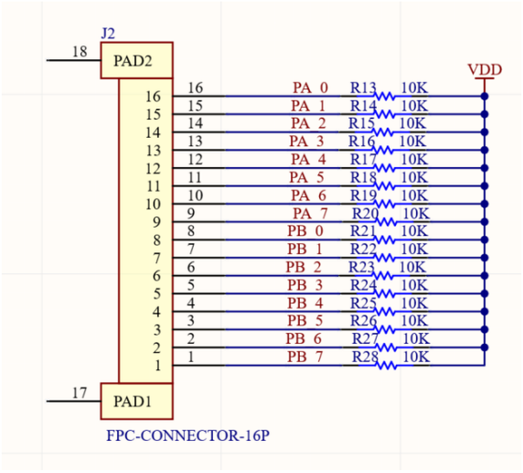

Figure 10: Matrix Buttons Connector

Full schematic

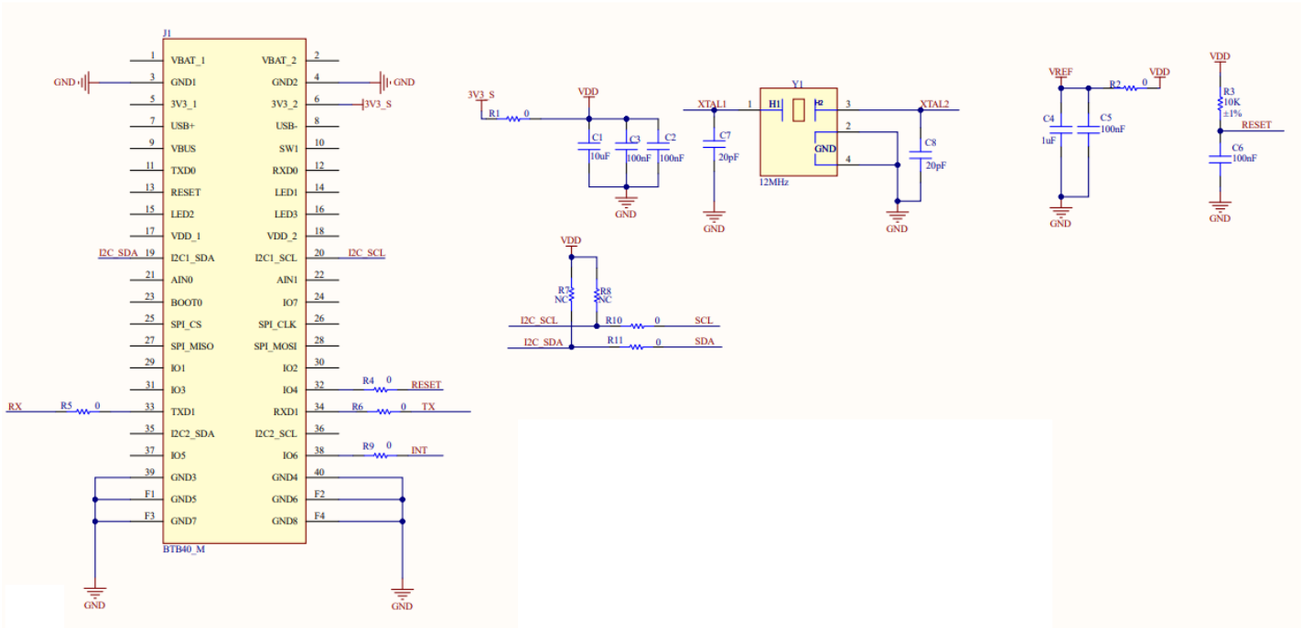

Figure 11: RAK14004 Schematic Diagram Part 1

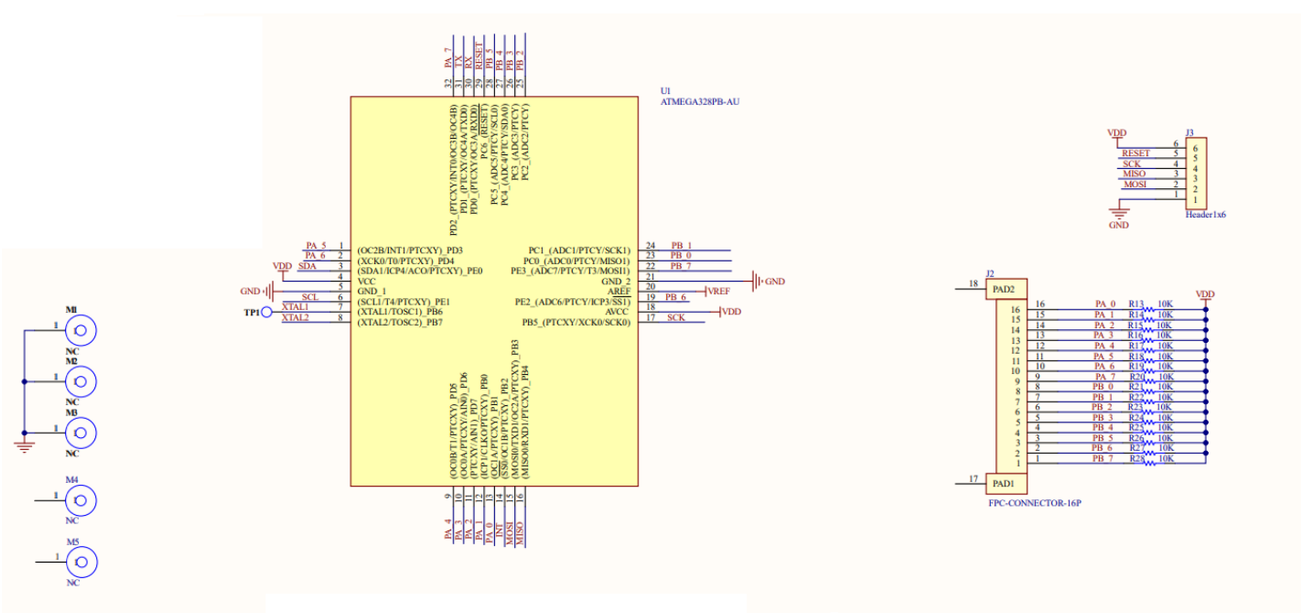

Figure 12: RAK14004 Schematic Diagram Part 2