RAK3244 BastWAN Breakout Board Datasheet

Overview

Description

The **RAK3244 BastWAN Breakout Board** is specifically designed to be compatible with **Feather format** while still harnessing the power of RAK4260 module. The board itself has the RAK4260 as its core, which is a module that utilizes ATSAMR34J18B SiP. The high level of integration allows for outstanding performance: Lora TX Power of up to 20 dBm.

A notable addition to this breakout board is the ATECC606A **Cryptographic co-processor** with secure hardware-based key storage. This is what makes the RAK3244 BastWAN different compared to the RAK4200 and RAK4600, adding another level of security to future-proof your platform.

The board complies with LoRaWAN 1.0.2 specification, and it also supports LoRa P2P Point to Point communication. The low power, long-range LoRa communication capabilities of the board make it suitable for a variety of applications in the IoT field such as home automation, sensor networks, building automation, and personal area networks applications such as health/fitness sensors and monitors.

Features

- Feather compatible with a feather-like weight of 5 grams
- RAK4260 @ 48 MHz with 3.3 V logic/power
- 256 KB of FLASH + 32KB of RAM
- 32.768 kHz crystal for clock generation & RTC
- 3.3 V regulator with 500 mA peak current output
- USB native support, comes with USB bootloader and serial port debugging
- Up to 20 GPIO pins
- Hardware Serial, hardware I2C, hardware SPI support
- PWM outputs on all pins
- 6 x 12-bit analog inputs
- 1 x 10-bit analog output (DAC)
- Built-in 100 mA LiPoly charging port, with LED indicator
- Programmable built-in LED for customized applications
- Power/enable pin
- Four (4) mounting holes
- Reset button

Specifications

Overview

The RAK3244 BastWAN Breakout Board is shown in Figure 1, which displays the top and back view of the board, respectively.
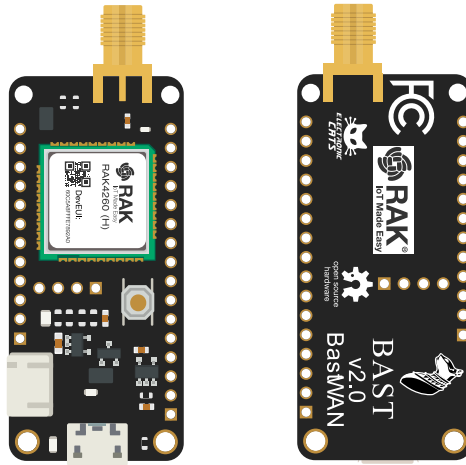
Figure 1: RAK3244 BastWAN Breakout Board Front and Back View

Block Diagram

The block diagram of the RAK3244 BastWAN shows the various interfaces for the specific functionalities set in the product overview.
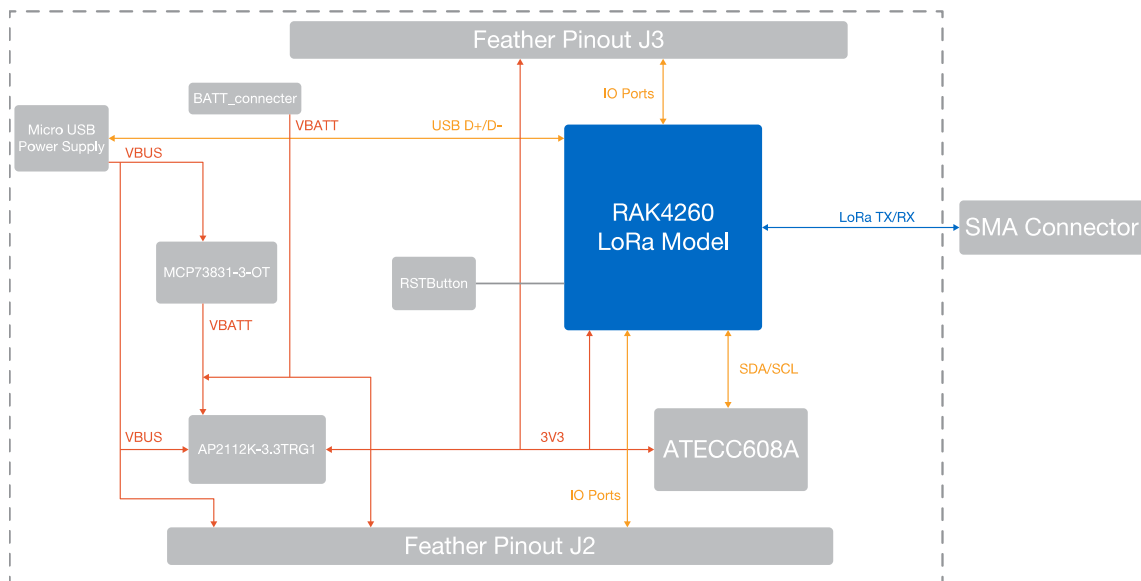

Figure 2: RAK3244 BastWAN Breakout Board Block Diagram

Hardware

The hardware specification is categorized into four parts. It discuses the interfacing, pinouts and its corresponding functions and diagrams. It also covers the RF and mechanical parameters of the RAK3244 BastWAN Breakout Board.

Interfaces

Figure 3 shows the overview of interfaces found on RAK3244 BastWAN Breakout Board.
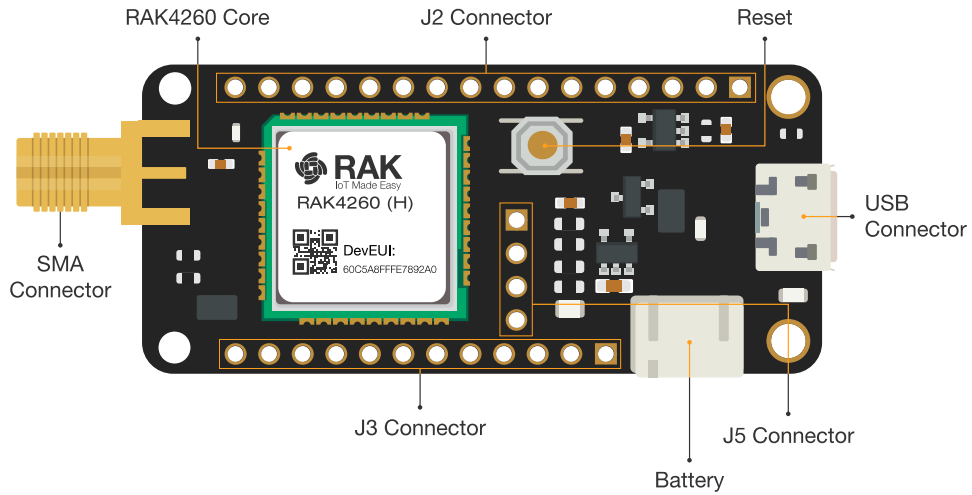
Figure 3: RAK3244 BastWAN Breakout Board Interface Overview

SWD Programming Interface

When programming via a DAPLink tool, it is required to have all of the following four (4) pins connected to your DAPLink tool:

1. **3V3**
2. **SWDIO**
3. **SWCLK**
4. **GND**

> 📝 **NOTE**
>
> For the aforementioned reason, it is best you leave these exposed for programming purposes and not to remap them as GPIOs.

The proper connection between the DapLink tool and RAK3244 BastWAN Breakout Board is illustrated in Figure 4.
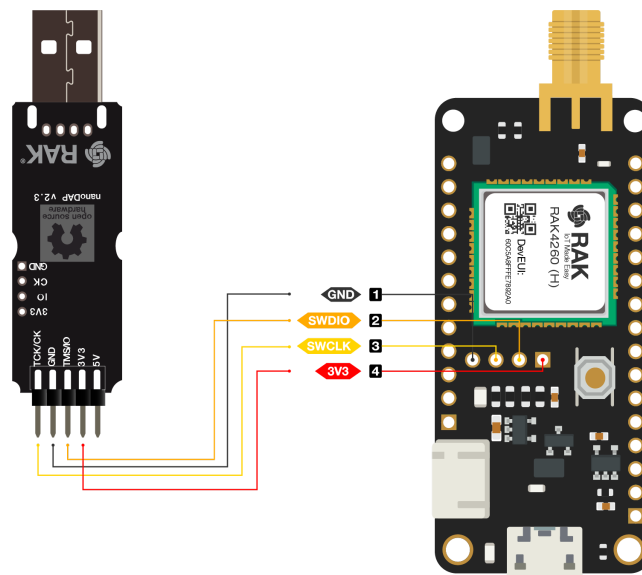

Figure 4: RAK3244 BastWAN Breakout Board Pinout for DapLink tool

I2C Interface

I2C_SCL and **I2C_SDA** are connected to the ATECC608A crypto chip for the purpose of developing cryptographic applications: network end-point key management and exchange small message and PII data encryption, secure boot and protected download, ecosystem control and anti-cloning. Additional I2C peripherals can be added using the breakout pins on connector J3.

RF Interface

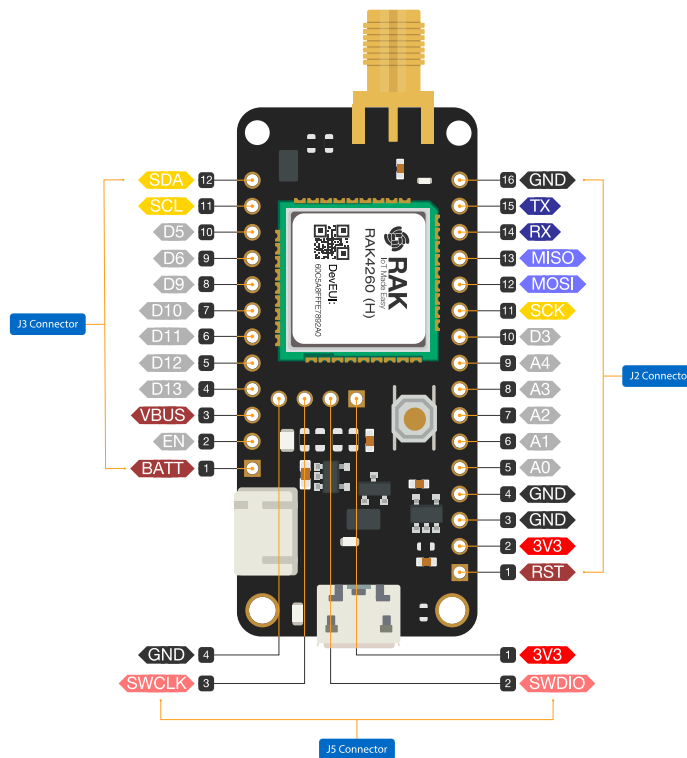The RF pin of the RAK4260 module is wired to an SMA antenna connector.

Pin Definition

Figure 5: RAK3244 BastWAN Breakout Board Pinout

The following tables below show the pin definition of the RAK3244 BastWAN Breakout Board:

J2 Pin Definitions

Pin	Name	I/O	Description
1	RST	-	MCU reset
2	3V3	-	3V3 Power
3	GND	-	GND
4	GND	-	GND
5	A0	I/O	PA09
6	A1	I/O	PA08
7	A2	I/O	PA07
8	A3	I/O	PA06
9	A4	I/O	PA04
10	D3	I/O	PB03
11	SCK	I/O	PB23
12	MOSI	I/O	PB02
13	MISO	I/O	PA23
14	RX	I/O	PA19
15	TX	I/O	PA18
16	GND	-	GND

J3 Pin Definitions

Pin	Name	I/O	Description
1	BATT	-	Battery Power
2	EN	-	Enable Pin for charging chip
3	VBUS	-	USB Power
4	D13	I/O	PA22
5	D12	I/O	PA28
6	D11	I/O	PA05
7	D10	I/O	PA14
8	D9	I/O	PA15
9	D6	I/0	PB22
10	D5	I/0	PB27
11	SCL	I/O	SCL
12	SDA	I/O	SDA

J5 Pin Definitions

Pin	Name	I/O	Description
1	3V3	-	3V3 Power
2	SWDIO	I/O	PA31
3	SWCLK	I/O	PA30
4	GND	-	GND

RF Characteristics

Operating Frequencies

The RAK3244 Breakout Board supports the following LoRa bands:

Region	Frequency (MHz)
Europe	EU868
North America	US915
Australia	AU915
Asia	AS923

Sensitivity Level

The following charts show the receiving sensitivity of RAK3244 BastWAN at 866 Mhz operating frequency.

Receive Power @iPEX	-40	-50	-60	-70	-80	-90	-100	-110	-120	-121	-122	-123	-124	-125	-126	-127	-128	-129	-130
PER (%) @SF7	0	0	0	0	0	0	0	0	0	0	0	0	0	3	20	78	100	100	100

Receive Power @iPEX	-50	-60	-70	-80	-90	-100	-110	-120	-130	-131	-132	-133	-134	-135	-136	-137	-138	-139	-140
PER (%) @SF12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	80	100

Figure 6: RAK3244 BastWAN Breakout Board Sensitivity Levels
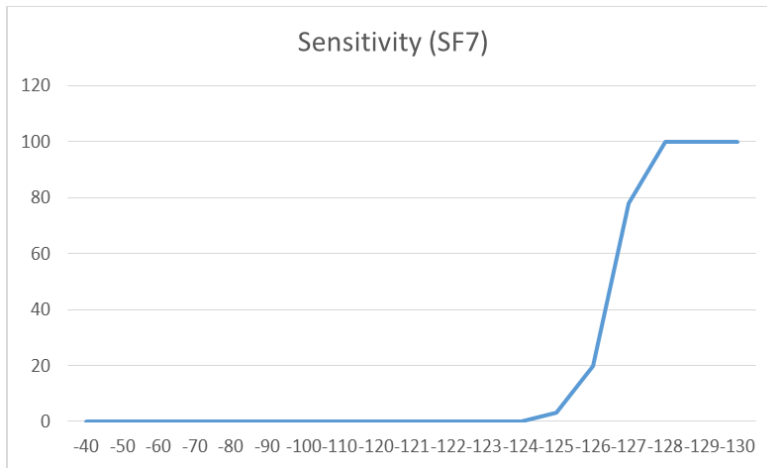

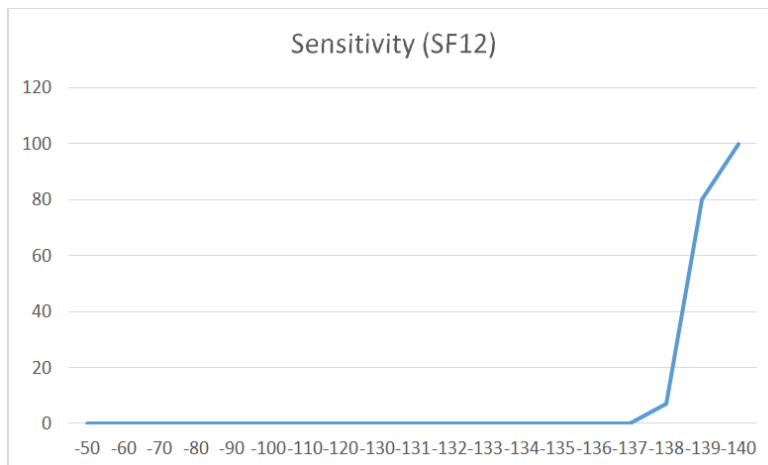**Figure 7:** RAK3244 BastWAN Breakout Board Sensitivity Plot @ SF7

Figure 8: RAK3244 BastWAN Breakout Board Sensitivity Plot @ SF12

Mechanical Characteristics

Board Dimensions

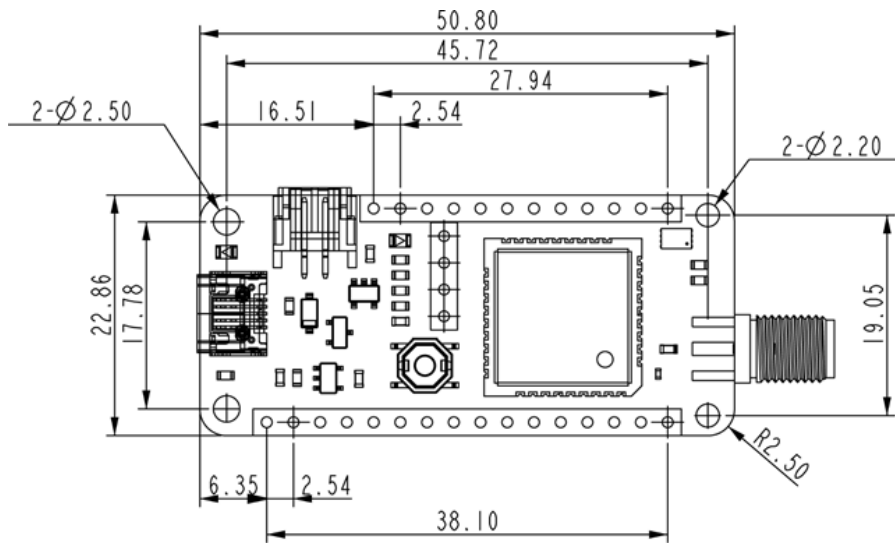Figure 9 shows the actual dimensions of the RAK3244 BastWAN Breakout Board measured in millimeters (mm).

Figure 9: RAK3244 BastWAN Breakout Board Board Dimension

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