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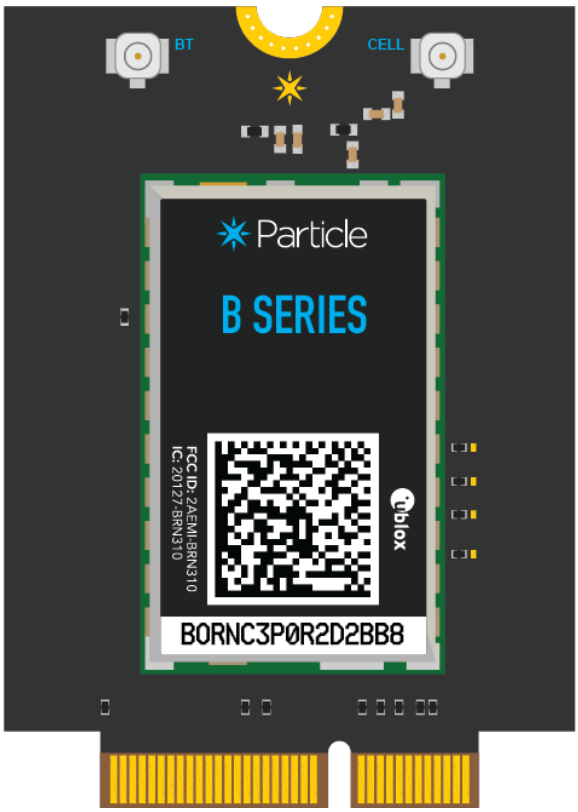


The B Series SoM (system-on-a-module) is similar to the Boron in that it is a 3rd-generation cellular device. It plugs into an M.2 NGFF connector on your custom circuit board and is intended for mass production use.

Many of the extra features on the Boron have been omitted from the SoM, so you can implement a custom solution as necessary. For example, rather than duplicating the buttons and status LED on the SoM, you can put them on an external control panel for your product, or omit them entirely.

Additionally, the extra width vs. the Boron (Adafruit Feather) form-factor makes it possible to include a LTE Cat 1 with 2G/3G fallback cellular modem, such as the Quectel EG91-E on the B524. This modem is too wide to fit on a Boron.

Feature	Boron	B Series SoM	SoM Base Board	Tracker SoM
U.FL Antenna Connector	✓	✓	Optional	✓
MFF2 SMD Particle SIM[2]	✓	✓		✓
Nano 4FF SIM card connector	✓			
USB Connector	✓		Optional	Optional
Status LED	✓		Optional	Optional
Reset and Mode Buttons	✓		Optional	Optional
Battery Connector	✓		Optional	Optional
PMIC and Fuel Gauge[1]	✓		Optional	✓

[1]The PMIC (power management IC) and fuel gauge are used with battery-powered applications. They're omitted from the SoM as they are not needed for externally powered solutions (grid or automotive power, for example). Additionally, you may want to use different models if you are making a solar-powered device, or using a different battery technology or multiple battery pack.

[2]The built-in Particle SIM card is free for use up to certain limits, no credit card required.

The available models include:

Model	Region	EtherSIM	Bands	Lifecycle	Replacement
B404X	United States, Canada, Mexico	✓	LTE Cat M1	Coming soon	
B524	Europe, Australia, New Zealand	✓	LTE Cat M1	GA	
B404	United States, Canada, Mexico	✓	LTE Cat M1	Last buy	Use B404X instead
B402	United States, Canada, Mexico		LTE Cat 1, 2G, 3G	Deprecated	Use B404X instead
B523	Europe		LTE Cat 1, 2G, 3G	Deprecated	Use B524 instead

- The B404X, B404, and B402 cannot be used in Central or South America.
- The B524 is only recommended for use in Europe, Australia, and New Zealand.
- The B524 and B523 do not work out of the EMEAA region.
- See the Carrier List for compatibility in specific countries

DATASHEETS

- B404X/B4404/B402 datasheet
- B524/B523 datasheet
- B Series evaluation board

If you want to migrate from the Electron or E Series to the B Series SoM, see Gen 2 cellular migration.

COUNTRIES - B404X, B404

Country	Model	Technologies	Carriers
Canada	B404	M1	Bell Mobility, Rogers Wireless, Telus
Mexico	B404	M1	AT&T
United States	B404	M1	AT&T

COUNTRIES - B524

Country	Model	Technologies	Carriers
Albania	B524	2G, 3G, Cat1	ALBtelecom, Telekom, Vodafone
Australia	B524	3G, Cat1	Optus, Telstra, Vodafone
Austria	B524	2G, 3G, Cat1	3 (Drei), A1, T-Mobile
Belarus	B524	2G, 3G, Cat1	A1
Belgium	B524	2G, 3G, Cat1	Base, Orange, Proximus
Bosnia and Herzegovina	B524	2G, 3G	BH Telecom, HT Eronet
Bulgaria	B524	2G, 3G	A1, Telenor, Vivacom
Croatia	B524	2G, 3G, Cat1	Hrvatski Telekom, Tele2
Czechia	B524	2G, 3G, Cat1	O2, T-Mobile, Vodafone
Denmark	B524	2G, 3G, Cat1	3 (Tre), TDC, Telenor, Telia
Estonia	B524	2G, 3G, Cat1	Elisa, Tele2, Telia
Faroe Islands	B524	2G, 3G	Faroese Telecom, Vodafone
Finland	B524	2G, 3G, Cat1	DNA, Elisa, Telia
France	B524	2G, 3G, Cat1	Bouygues, Free Mobile, Orange, SFR
Germany	B524	2G, 3G, Cat1	O2, Telekom, Vodafone

Gibraltar	B524	2G, 3G, Cat1	Gibtel
Greece	B524	2G, 3G, Cat1	Cosmote, Vodafone, Wind
Hungary	B524	2G, 3G, Cat1	Magyar Telekom, Telenor, Vodafone
Iceland	B524	2G, 3G, Cat1	Nova, Siminn, Vodafone
Ireland	B524	2G, 3G, Cat1	3 (Tre), Meteor, O2, Vodafone
Italy	B524	2G, 3G, Cat1	TIM, Vodafone, Wind
Latvia	B524	2G, 3G, Cat1	Bite, LMT, Tele2
Liechtenstein	B524	2G, 3G, Cat1	Mobilkom, Orange
Lithuania	B524	2G, 3G, Cat1	Bite, Omnitel, Tele2
Luxembourg	B524	2G, 3G, Cat1	Orange, POST, Tango
Malta	B524	2G, 3G, Cat1	Go Mobile, Vodafone
Moldova	B524	2G, 3G, Cat1	Moldcell, Orange
Montenegro	B524	2G, 3G, Cat1	Mtel, T-Mobile, Telenor
Netherlands	B524	2G, 3G, Cat1	KPN, T-Mobile, Vodafone
New Zealand	B524	2G, 3G, Cat1	2degrees, Spark, Vodafone
Norway	B524	2G, 3G, Cat1	TDC, Telenor, Telia
Poland	B524	2G, 3G, Cat1	Orange, Play, Plus, T-Mobile
Portugal	B524	2G, 3G, Cat1	NOS, TMN, Vodafone
Romania	B524	2G, 3G, Cat1	DigiMobil, Orange, Telekom Romania, Vodafone
Serbia	B524	2G, 3G, Cat1	Telenor, VIP
Slovakia	B524	2G, 3G, Cat1	O2, Orange, Telekom
Slovenia	B524	2G, 3G, Cat1	A1, Mobitel
Spain	B524	2G, 3G, Cat1	Orange, Telefonica, Vodafone, Yoigo
Sweden	B524	2G, 3G, Cat1	3 (Tre), Tele2, Telenor, Telia
Switzerland	B524	3G, Cat1	Salt, Sunrise, Swisscom
United Kingdom	B524	2G, 3G, Cat1	3, EE, Manx, O2, Sure, Vodafone

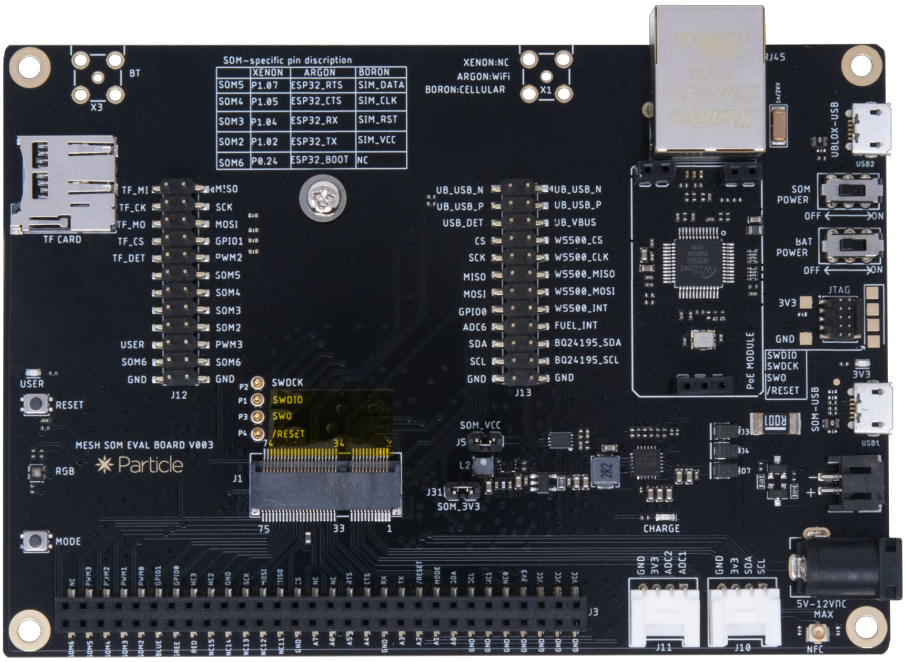
SKUS

SKU	Description	Region	Lifecycle
B404MEA	B Series LTE CAT-M1 (NorAm), [x1]	NORAM	GA
B404XMEA	B Series LTE CAT-M1 (NorAm), [x1]	NORAM	GA
B404XMTY	B Series LTE CAT-M1 (NorAm), Tray [x50]	NORAM	GA
B524MEA	B Series LTE CAT-1/3G/2G (Europe) [x1]	EMEAA	GA
B524MTY	B Series LTE CAT-1/3G/2G (Europe), Tray [x50]	EMEAA	GA
M2EVAL	Particle M.2 SoM Evaluation Board [x1]	Global	GA

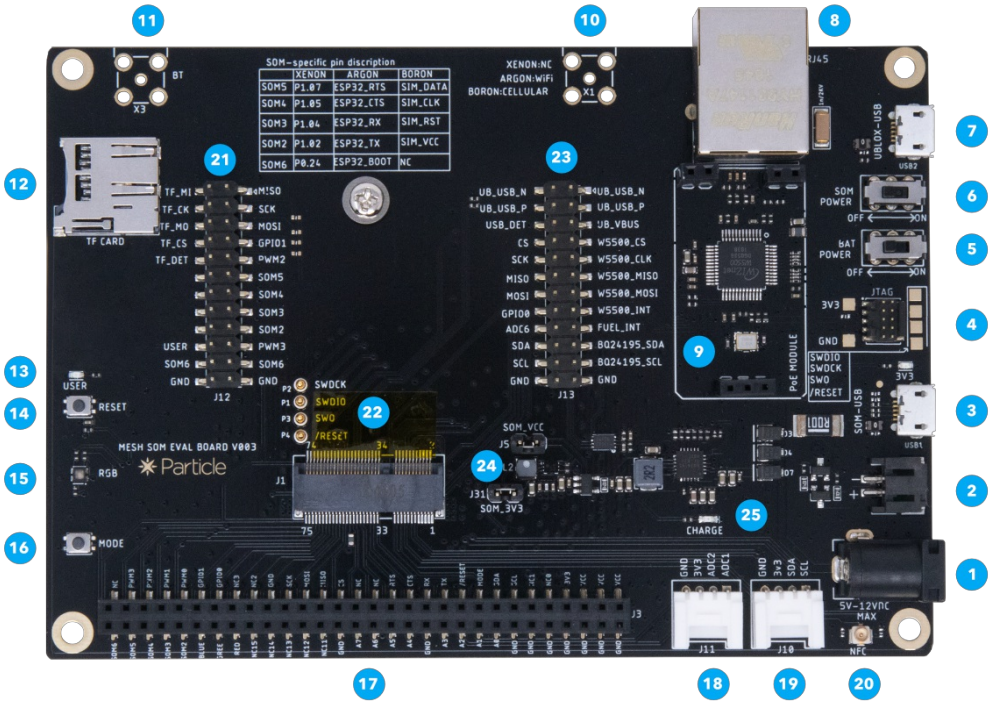
Prototyping

The B Series SoM cannot be used without a base board. Typically you will create your own board, however there are two off-the-shelf options available:

B SERIES EVAL BOARD

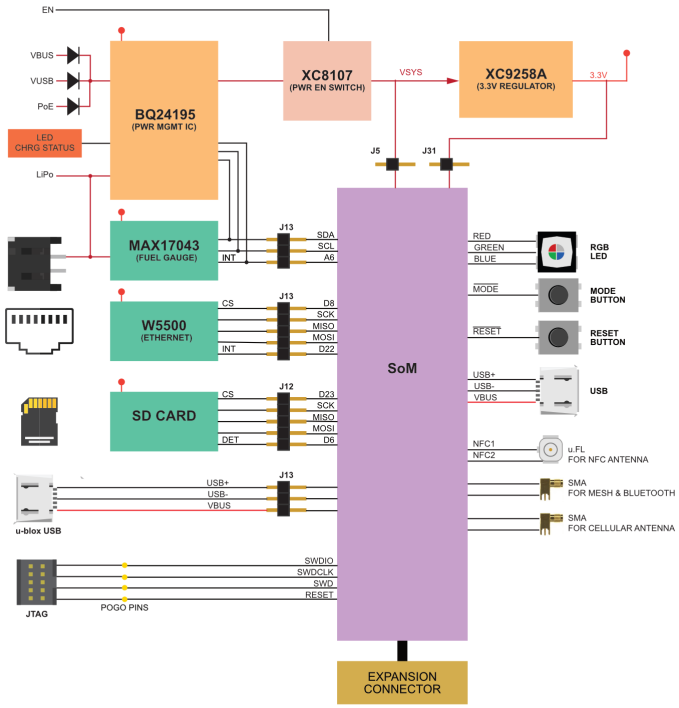


The B Series evaluation board provides a variety of interfaces and access to all ports and pins on the B Series SoM. You can use the expansion connector to connect the evaluation board to a breadboard for prototyping. You can also add sensors and accessories using the Grove expansion connectors.

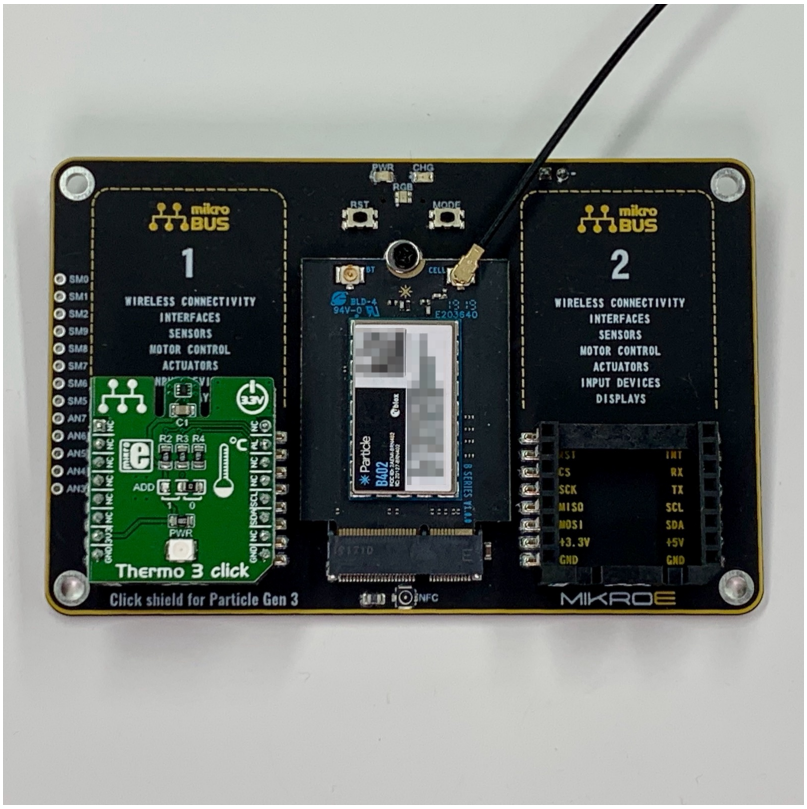


Num	ID	Description
1	**External Power**	5-12 VDC. Minimum power requirements are 5VDC @500mA (when the LiPo battery) or 5VDC @2000mA (without LiPo battery).
2	**LiPo Battery connector**	Plug in the LiPo battery here.
3	**SoM USB port**	This is the module's main USB port that connects to the microcontroller.
4	**JTAG connector**	This can plug directly into the Particle debugger ribbon cable.
5	**Battery switch**	Controls power between the LiPo connector and the charge controller.
6	**SoM power switch**	Controls 3V3 power to the SoM
7	**u-blox USB port**	This USB port connects directly to the u-blox module for firmware updates.
8	**Ethernet connector**	RJ45 connector for twisted pair Ethernet, 10 or 100 Mbit/sec.
9	**PoE connector**	Connect for the Particle PoE adapter for power-over-Ethernet.
10	**Cellular antenna**	Connector for an external SMA connected cellular antenna.
11	**Bluetooth antenna**	Connector for an external SMA connected antenna for Bluetooth networking.
12	**TF/SD Card**	MicroSD card slot.
13	**User LED**	Blue LED connected to pin D7.
14	**Reset Button**	This is same as the RESET button on the Boron.
15	**RGB LED**	System status indicator RGB LED.
16	**Mode Button**	This is the same as the MODE button on the Boron.
17	**Expansion Connector**	Allows easy access to SoM IO pins.
18	**Grove Analog Port**	Connects to Seeed Studio Grove analog and digital boards.
19	**Grove I2C Port**	Connects to Seeed Studio Grove I2C boards.
20	**NFC Antenna**	U.FL connector for an NFC antenna (optional).

21	**Jumpers J12**	Enable or disable various features on the evaluation board.
22	**SoM connector**	M.2 connector for the Boron SoM.
23	**Jumpers J13**	Enable or disable various features on the evaluation board.
24	**Power Jumpers**	Enable or disable power from the evaluation board.
25	**Charge LED**	Indicate LiPo is charging.



MIKROE GEN 3 SOM SHIELD



The Gen 3 SoM shield connects a B Series SoM to mikroBUS Click boards:

M.2 Pin	Generic SoM	Gen 3	mikroBUS #1	mikroBUS #2
20	SCL	D1	SCL	SCL
22	SDA	D0	SDA	SDA
23	ADC0	A0		RST2
33	ADC1	A1	AN1	
35	ADC2	A2		AN2
36	TX	TX/D9	TX	TX
37	ADC3	A3		
38	RX	TX/D10	RX	RX
41	ADC4	A4		
43	ADC5	A5		
45	ADC6	A6		
47	ADC7	A7		
48	CS	D8	CS1	
50	MISO	MISO/D11	MISO	MISO
52	MOSI	MOSI/D12	MOSI	MOSI
54	SCK	SCK/D13	SCK	SCK
62	GPIO0	D22	INT1	
64	GPIO1	D23		INT2
66	PWM0	D4		CS2
68	PWM1	D5	PWM1	
70	PWM2	D6		PWM2
72	PWM3	D7	RST1	

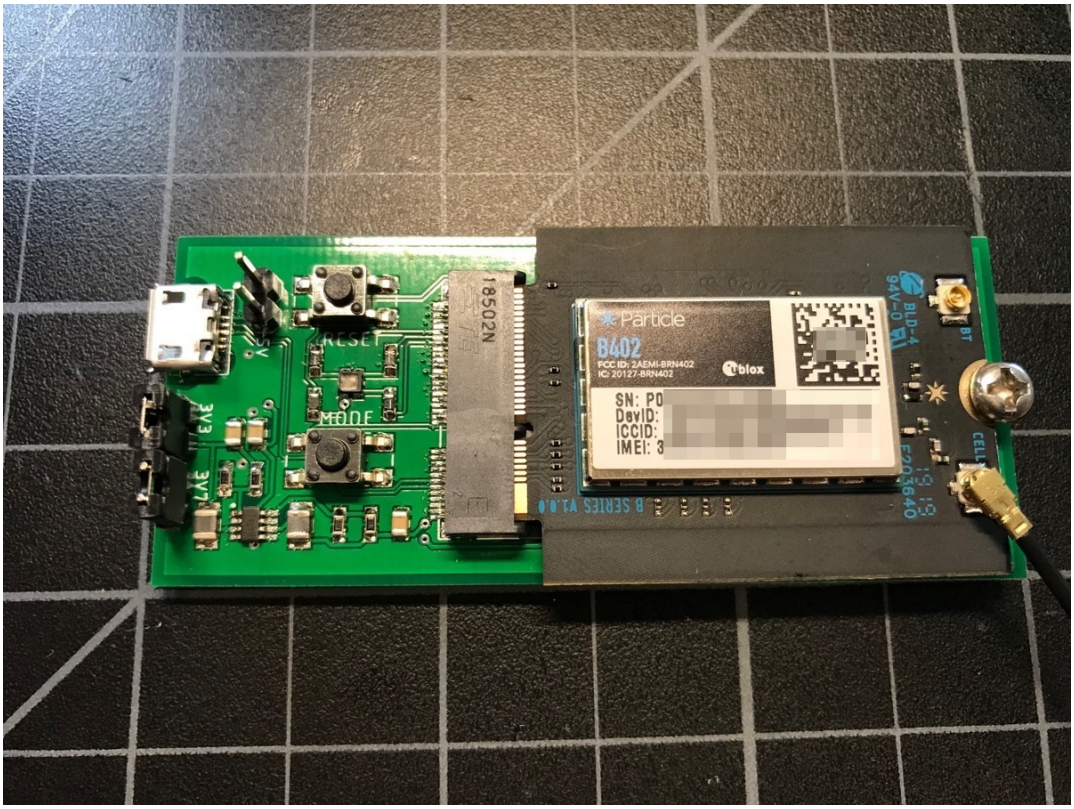
There is a huge library of mikroBUS Click expansion boards, however the caveat is that most of them do not already have a Particle software library. If the board is for a common sensor or chip, however, existing Particle libraries for the chip will typically work, even if not designed work with the Click.

For more information, see the Mikroe community page.

Creating a board

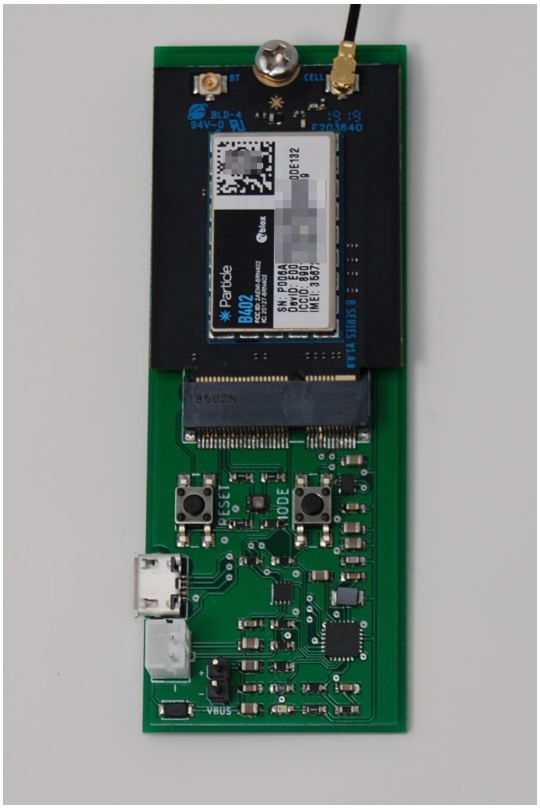
FIRST SOM BOARD TUTORIAL

The SoM first board tutorial shows how to get started with the M.2 SoM boards by making the simplest possible design. It's an introduction to working with surface mount components you will need in order to make your own SoM base board.



BASIC SOM DESIGN

This design is a bit more complicated, and includes the PMIC and Fuel Gauge chips that are present on the Boron:



- RGB LED
- bq24195 PMIC
- MAX17043 Fuel Gauge
- USB Connector
- LiPo Connector (JST-PH)
- M.2 SoM Connector

This is the basic set of features you'll probably want to include in a LiPo battery-powered design. The Evaluation Board is also a good reference to use. This design, however, is simple enough that it can be hand-assembled, though you still need a reflow oven and some of the parts (in particular the fuel gauge and PMIC) are tiny and there are a lot of them.

This board a two-layer circuit board so it can be manufactured inexpensively and edited using the free version of Eagle CAD.

As this board doesn't really do much, you'll unlikely use it as-is, but you can use it as a tutorial for how to hook up the PMIC and fuel gauge.

Hardware differences

ANTENNAS

The Boron has a built-in BLE chip antenna, antenna switch, and U.FL antenna connector. The B Series SoM only has a U.FL connector for BLE and does not have a built-in antenna.

Both require an external cellular antenna.

Both require an external antenna for NFC tag.

SPI

SPI is mostly unchanged between the Boron and B Series SoM. The only difference is the default SS pin, however you can choose any GPIO for your SPI chip select, you do not need to use the default.

Boron Pin Name	Boron SPI	B Series SoM Pin Name	B Series SoM SPI
A5 / D14	SPI (SS)	A5 / D14	
D2	SPI1 (SCK)	D2	SPI1 (SCK)
D3	SPI1 (MOSI)	D3	SPI1 (MOSI)
D4	SPI1 (MISO)	D4	SPI1 (MISO)
D8 / WKP		D8	SPI (SS)
MISO / D11	SPI (MISO)	MISO / D11	SPI (MISO)
MOSI / D12	SPI (MOSI)	MOSI / D12	SPI (MOSI)
SCK / D13	SPI (SCK)	SCK / D13	SPI (SCK)

SERIAL (UART)

Hardware serial (UART) ports are unchanged between the Boron and B Series SoM.

Boron Pin Name	Boron Serial	B Series SoM Pin Name	B Series SoM Serial
D2	Serial1 RTS	D2	Serial1 RTS
D3	Serial1 CTS	D3	Serial1 CTS
RX / D10	Serial1 RX	RX / D10	Serial1 RX
TX / D09	Serial1 TX	TX / D9	Serial1 TX

ANALOG INPUT (ADC)

There are two additional ADC inputs on the B Series SoM. These can also be used as digital GPIO.

Boron Pin Name	Boron ADC	B Series SoM Pin Name	B Series SoM ADC
A0 / D19	✓	A0 / D19	✓
A1 / D18	✓	A1 / D18	✓
A2 / D17	✓	A2 / D17	✓
A3 / D16	✓	A3 / D16	✓
A4 / D15	✓	A4 / D15	✓
A5 / D14	✓	A5 / D14	✓
		A6	✓
		A7	✓

PWM (PULSE-WIDTH MODULATION)

These are differences in pins that support PWM between the Boron and B Series SoM.

Boron Pin Name	Boron PWM	B Series SoM Pin Name	B Series SoM PWM
A0 / D19	✓	A0 / D19	✓
A1 / D18	✓	A1 / D18	✓
A2 / D17	✓	A2 / D17	
A3 / D16	✓	A3 / D16	
A4 / D15	✓	A4 / D15	
A5 / D14	✓	A5 / D14	
		A6	✓
		A7	✓
D2	✓	D2	
D3	✓	D3	
D4	✓	D4	✓
D5	✓	D5	✓
D6	✓	D6	✓
D7	✓	D7	✓
D8 / WKP	✓	D8	

INTERRUPTS

All pins can be used for interrupts on Gen 3 devices, however only 8 pins can be used for interrupts at the same time.

RETAINED MEMORY

Retained memory, also referred to as Backup RAM or SRAM, that is preserved across device reset.

On both the Boron and B Series SoM, retained memory is 3068 bytes.

The flash file system on Gen 3 devices can also be used for data storage, however care must be taken to avoid excessive wear of the flash for frequently changing data.

USB

The Boron has a Micro USB B connector.

The B Series SoM does not have a USB connector. It is recommended that you add one to your base board for programming and troubleshooting/

NFC TAG

The Boron and B Series SoM have NFC Tag support.

The Boron has a U.FL connector on the bottom of the board; you must supply your own NFC antenna connector or integrated antenna on your base board.

FULL MODULE PIN COMPARISON

3V3

	Boron	B Series SoM
Pin Number	2	10
Pin Name	3V3	3V3
Description	Regulated 3.3V DC output, maximum load 1000 mA	System power in, supply a fixed 3.0-3.6v power.

A0

	Boron	B Series SoM
Pin Number	5	23
Pin Name	A0	A0
Pin Alternate Name	D19	D19
Description	A0 Analog in, GPIO, PWM	A0 Analog in, GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	A0, A1, A2, and A3 must have the same frequency.	A0, A1, A6, and A7 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A1

	Boron	B Series SoM
Pin Number	6	33
Pin Name	A1	A1
Pin Alternate Name	D18	D18
Description	A1 Analog in, GPIO, PWM	A1 Analog in, GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	A0, A1, A2, and A3 must have the same frequency.	A0, A1, A6, and A7 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A2

	Boron	B Series SoM
Pin Number	7	35
Pin Name	A2	A2
Pin Alternate Name	D17	D17
Description	A2 Analog in, GPIO, PWM	A2 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes

Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	A0, A1, A2, and A3 must have the same frequency.	No
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A3

	Boron	B Series SoM
Pin Number	8	37
Pin Name	A3	A3
Pin Alternate Name	D16	D16
Description	A3 Analog in, GPIO, PWM	A3 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	A0, A1, A2, and A3 must have the same frequency.	No
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A4

	Boron	B Series SoM
Pin Number	9	41
Pin Name	A4	A4
Pin Alternate Name	D15	D15
Description	A4 Analog in, GPIO, PWM	A4 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	A4, A5, D2, and D3 must have the same frequency.	No
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A5

	Boron	B Series SoM
Pin Number	10	43
Pin Name	A5	A5
Pin Alternate Name	D14	D14
Description	A5 Analog in, GPIO, PWM, SPI SS	A5 Analog in, GPIO
Supports digitalRead	Yes	Yes

Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	A4, A5, D2, and D3 must have the same frequency.	No
SPI interface	SS. Use SPI object. This is only the default SS/CS pin, you can use any GPIO instead.	n/a
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

A6

	Added to B Series SoM
Pin Number	45
Pin Name	A6
Description	A6 Analog in, PWM, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports analogWrite (PWM)	Yes
Supports tone	A0, A1, A6, and A7 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.

A7

	Added to B Series SoM
Pin Number	47
Pin Name	A7
Description	A7 Analog in, GPIO, Ethernet Reset
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports analogWrite (PWM)	Yes
Supports tone	A0, A1, A6, and A7 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.

AGND

	Added to B Series SoM
Pin Number	39
Pin Name	AGND
Description	Analog Ground.

Cellular Modem USBD-

	Added to B Series SoM
Pin Number	46
Pin Name	Cellular Modem USBD-
Description	Cellular Modem USB Data-

Input is 5V Tolerant	Yes

Cellular Modem USBD+

	Added to B Series SoM
Pin Number	44
Pin Name	Cellular Modem USBD+
Description	Cellular Modem USB Data+
Input is 5V Tolerant	Yes

Cellular Modem VBUS

	Added to B Series SoM
Pin Number	74
Pin Name	Cellular Modem VBUS
Description	USB detect pin for R410M. 5V on this pin enables the Cellular Modem USB interface.
Input is 5V Tolerant	Yes

D0

	Boron	B Series SoM
Pin Number	16	22
Pin Name	D0	D0
Description	I2C SDA, GPIO	I2C SDA, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
I2C interface	SDA. Use Wire object.	SDA. Use Wire object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D1

	Boron	B Series SoM
Pin Number	17	20
Pin Name	D1	D1
Description	I2C SCL, GPIO	I2C SCL, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
I2C interface	SCL. Use Wire object.	SCL. Use Wire object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D2

	Boron	B Series SoM
Pin Number	18	42
Pin Name	D2	D2
Description	SPI1 SCK, Serial1 RTS, GPIO, PWM	SPI1 SCK, Serial1 RTS, PWM, GPIO, Wire1 SDA
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes

Supports analogWrite (PWM)	Yes	No
Supports tone	A4, A5, D2, and D3 must have the same frequency.	No
UART serial	Optional RTS hardware flow control for Serial1	Optional RTS hardware flow control for Serial1
SPI interface	SCK. Use SPI1 object.	SCK. Use SPI1 object.
I2C interface	n/a	SDA. Use Wire1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D22

	Added to B Series SoM
Pin Number	62
Pin Name	D22
Description	GPIO, Ethernet INT
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.

D23

	Added to B Series SoM
Pin Number	64
Pin Name	D23
Description	GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.

D3

	Boron	**B Series SoM**
Pin Number	19	40
Pin Name	D3	D3
Description	SPI1 MOSI, Serial1 CTS, PWM, GPIO	SPI1 MOSI, Serial1 CTS, GPIO, Wire1 SCL
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	A4, A5, D2, and D3 must have the same frequency.	No
UART serial	Optional CTS hardware flow control for Serial1	Optional CTS hardware flow control for Serial1
SPI interface	MOSI. Use SPI1 object.	MOSI. Use SPI1 object.
I2C interface	n/a	SCL. Use Wire1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D4

	Boron	B Series SoM
Pin Number	20	66
Pin Name	D4	D4
Description	SPI1 MISO, PWM, GPIO	SPI1 MISO, PWM, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	D4, D5, D6, and D7 must have the same frequency.	D4, D5, and D6 must have the same frequency.
SPI interface	MISO. Use SPI1 object.	MISO. Use SPI1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D5

	Boron	B Series SoM
Pin Number	21	68
Pin Name	D5	D5
Description	PWM, GPIO	PWM, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	D4, D5, D6, and D7 must have the same frequency.	D4, D5, and D6 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D6

	Boron	B Series SoM
Pin Number	22	70
Pin Name	D6	D6
Description	PWM, GPIO	PWM, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	D4, D5, D6, and D7 must have the same frequency.	D4, D5, and D6 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D7

	Boron	B Series SoM
Pin Number	23	72
Pin Name	D7	D7
Description	PWM, GPIO	PWM, GPIO
Supports digitalRead	Yes	Yes

Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	PWM is shared with the RGB LED, you can specify a different duty cycle but should not change the frequency.	PWM is shared with the RGB LED, you can specify a different duty cycle but should not change the frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

D8

	Boron	B Series SoM
Pin Number	24	48
Pin Name	D8	D8
Pin Alternate Name	WKP	n/a
Description	GPIO, PWM	GPIO, SPI SS, Ethernet CS
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	D4, D5, D6, and D7 must have the same frequency.	No
SPI interface	n/a	SS. Use SPI object. This is only the default SS/CS pin, you can use any GPIO instead.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

EN

	Removed from Boron
Pin Number	26
Pin Name	EN
Description	Power supply enable. Connect to GND to power down. Has internal weak (100K) pull-up.

GND

	Boron	B Series SoM
Pin Number	4	1
Pin Name	GND	GND
Description	Ground.	Ground.

LI+

	Removed from Boron
Pin Number	27
Pin Name	LI+
Description	Connected to JST PH LiPo battery connector. 3.7V in or out.

MISO

Boron	B Series SoM

Pin Number	13	50
Pin Name	MISO	MISO
Pin Alternate Name	D11	D11
Description	SPI MISO, GPIO	SPI MISO, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
SPI interface	MISO. Use SPI object.	MISO. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

MODE

	Boron	B Series SoM
Pin Number	3	32
Pin Name	MODE	MODE
Pin Alternate Name	D20	D20
Description	MODE button, has internal pull-up	MODE button, has internal pull-up

MOSI

	Boron	B Series SoM
Pin Number	12	52
Pin Name	MOSI	MOSI
Pin Alternate Name	D12	D12
Description	SPI MOSI, GPIO	SPI MOSI, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
SPI interface	MOSI. Use SPI object.	MOSI. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

NC

	Added to B Series SoM
Pin Number	14
Pin Name	NC
Description	n/a

NC

	Added to B Series SoM
Pin Number	75
Pin Name	NC
Description	n/a

NFC1

	Added to B Series SoM
Pin Number	17
Pin Name	NFC1
Description	NFC Antenna 1

NFC2

	Added to B Series SoM
Pin Number	19
Pin Name	NFC2
Description	NFC Antenna 2

RGBB

	Added to B Series SoM
Pin Number	65
Pin Name	RGBB
Description	RGB LED Blue

RGBG

	Added to B Series SoM
Pin Number	63
Pin Name	RGBG
Description	RGB LED Green

RGBR

	Added to B Series SoM
Pin Number	61
Pin Name	RGBR
Description	RGB LED Red

RST

	Boron	B Series SoM
Pin Number	1	34
Pin Name	RST	RST
Description	Hardware reset. Pull low to reset; can leave unconnected in normal operation.	Hardware reset, active low. External pull-up required.

RX

	Boron	B Series SoM
Pin Number	14	38
Pin Name	RX	RX
Pin Alternate Name	D10	D10
Description	Serial RX, GPIO	Serial RX, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
UART serial	RX Use Serial1 object.	RX Use Serial1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

SCK

	Boron	B Series SoM

Pin Number	11	54
Pin Name	SCK	SCK
Pin Alternate Name	D13	D13
Description	SPI SCK, GPIO	SPI SCK, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
SPI interface	SCK. Use SPI object.	SCK. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

SIM_CLK

	Added to B Series SoM
Pin Number	71
Pin Name	SIM_CLK
Description	Leave unconnected, 1.8V/3V SIM Clock Output from R410M.

SIM_DATA

	Added to B Series SoM
Pin Number	73
Pin Name	SIM_DATA
Description	Leave unconnected, 1.8V/3V SIM Data I/O of R410m with internal 4.7 k pull-up.

SIM_RST

	Added to B Series SoM
Pin Number	69
Pin Name	SIM_RST
Description	Leave unconnected, 1.8V/3V SIM Reset Output from R410M.

SIM_VCC

	Added to B Series SoM
Pin Number	67
Pin Name	SIM_VCC
Description	Leave unconnected, 1.8V/3V SIM Supply Output from R410M.

TX

	Boron	B Series SoM
Pin Number	15	36
Pin Name	TX	TX
Pin Alternate Name	D09	D9
Description	Serial TX, GPIO	Serial TX, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
UART serial	TX Use Serial1 object.	TX Use Serial1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes. You can only have 8 active interrupt pins.

USBDATA-

	Added to B Series SoM
Pin Number	13
Pin Name	USBDATA-
Description	USB Data-
Input is 5V Tolerant	Yes

USBDATA+

	Added to B Series SoM
Pin Number	11
Pin Name	USBDATA+
Description	USB Data+
Input is 5V Tolerant	Yes

VCC

	Added to B Series SoM
Pin Number	2
Pin Name	VCC
Description	System power in, connect to the +LiPo or supply a fixed 3.6-4.3v power.

VUSB

	Boron	B Series SoM
Pin Number	25	16
Pin Name	VUSB	VUSB
Description	Power out (when powered by USB) 5 VDC at 1A maximum. Power in with limitations.	USB VUSB power pin
Input is 5V Tolerant	Yes	Yes

Software

PLATFORM ID

Platform ID	Name	Description
13	boron	Boron (all models)
23	bsom	B404X, B404, and B402 B Series SoM
25	b5som	B524, B523 B Series SoM

The platforms IDs of the B Series SoM models vary from the Boron.

If you have a product based on the Boron, you will need to create a separate product (or two) for devices using the B Series SoM. While you may be able to use the same source code to build your application, the firmware binaries uploaded to the console will be different, so they need to be separate products. This generally does not affect billing as only the number of devices, not the number of products, is counted toward your plan limits.

The reason there are separate platforms for the B4xx and B5xx SoM is that they have different cellular modem manufacturers, u-blox and Quectel, respectively. All Boron models have u-blox cellular modems and thus can share a single platform.

THIRD-PARTY LIBRARIES

Most third-party libraries are believed to be compatible between the Boron and B Series SoM.

Version History

Revision	Date	Author	Comments
1	2022-03-17	RK	Initial version