

B-Series Evaluation board	3
Block diagram	4
Description	5
POWERING THE BOARD	6
JUMPERS J12	6
JUMPERS J13	7
POWER JUMPERS	8
PWM DIFFERENCES	9
Basic setup	10
USING THE PMIC AND FUEL GAUGE (RECOMMENDED)	10
POWER CONSUMPTION	10
USING THE MICROSD CARD	10
USING ETHERNET	12
USING THE GROVE CONNECTORS	12
Expansion header	13
LABELS	13
FULL DETAILS	14
1 GND	14
2 VCC	14
3 GND	14
4 VCC	14
5 GND	14
6 VCC	14
7 GND	15
8 3V3	15
9 GND	15
10 SOM10	15
11 SOM6	15
12 SOM11	15
13 SOM7	16
14 D1	16
15 A0	16
16 D0	16
17 A1	17
18 MODE	17
19 A2	17
20 RST	18
21 A3	18
22 TX	18
23 GND	18
24 RX	18
25 A4	19
26 D3	19
27 A5	19
28 D2	20
29 A6	20
30 SOM0	20

31 A7	21
32 SOM1	21
33 GND	21
34 D8	21
35 SOM14	22
36 MISO	22
37 SOM15	22
38 MOSI	22
39 SOM16	23
40 SCK	23
41 SOM17	23
42 GND	23
43 SOM18	23
44 SOM12	24
45 RGBR	24
46 SOM13	24
47 RGBG	24
48 D22	24
49 RGBB	25
50 D23	25
51 SOM5	25
52 D4	25
53 SOM6	26
54 D5	26
55 SOM7	26
56 D6	26
57 SOM8	27
58 D7	27
59 GND	27
60 SOM9	27
Evaluation board schematics	28
PAGE 1	28
PAGE 2	28
PAGE 3	28
Mechanical specifications	30
DIMENSIONS AND WEIGHT	30
Revision history	31

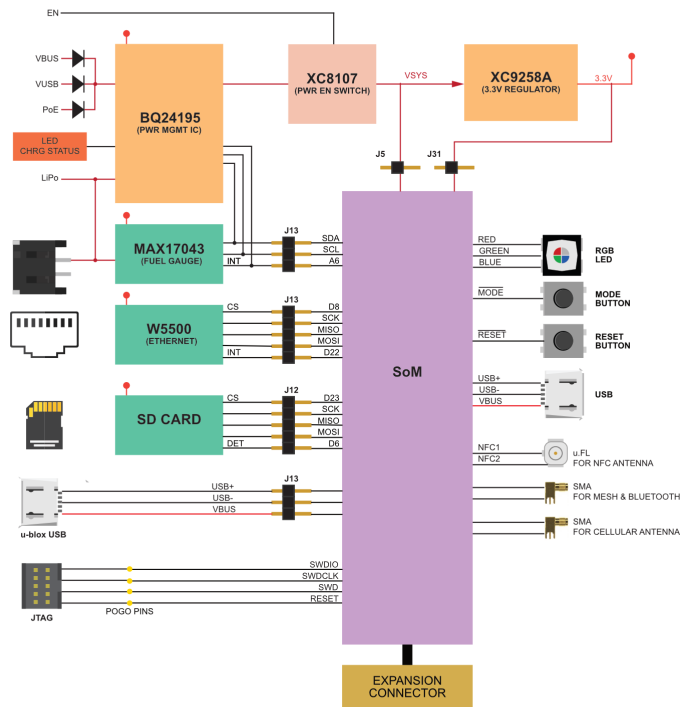
# B-Series Evaluation board

This is a simple breakout board for Particle's B series of cellular IoT modules. It breaks out all of its pins via easy to use headers. The board features a redundant USB port, connector for the LiPo battery, a barrel jack power connector, buttons, RGB LED, and charge status LED.

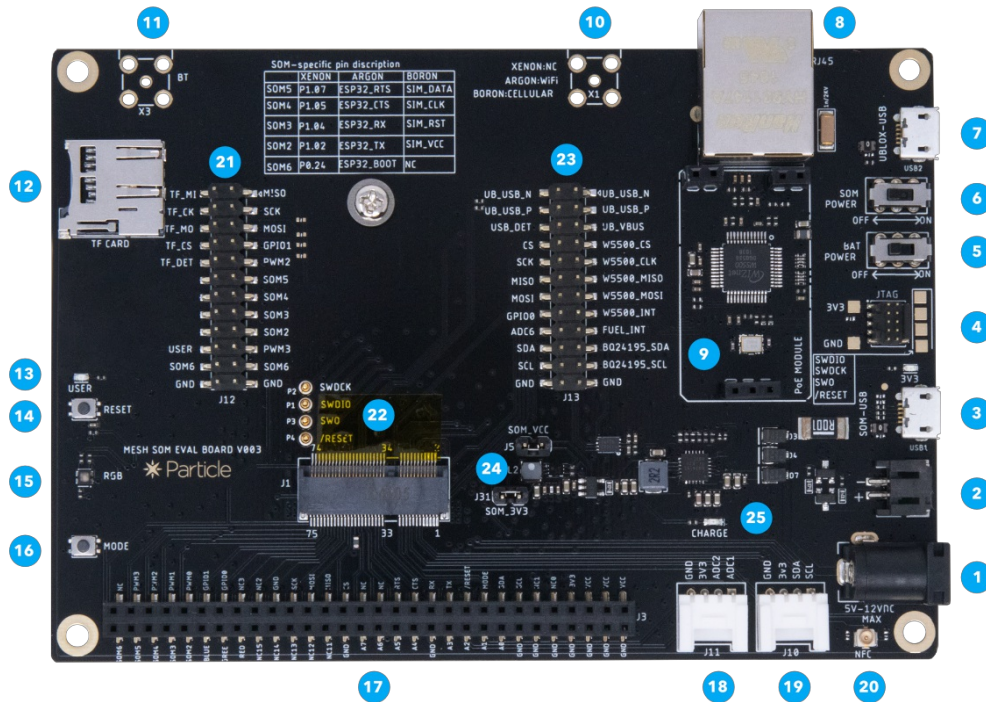
The Eagle CAD design files, Gerber files, and bill of materials can be found in the [SoM eval board GitHub repository](#).

**This evaluation board is intended to be used with the B-SoM** (B404X, B404, B402, B524, B523) not the M-SoM (M404, M524, M635) and a new M.2 breakout board will be available in the future for the M SoM.

# Block diagram



# Description



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

19	<b>Grove I2C Port</b>	Connects to Seeed Studio Grove I2C boards.
20	<b>NFC Antenna</b>	U.FL connector for an NFC antenna (optional).
21	<b>Jumpers J12</b>	Enable or disable various features on the evaluation board.
22	<b>SoM connector</b>	M.2 connector for the B-Series SoM.
23	<b>Jumpers J13</b>	Enable or disable various features on the evaluation board.
24	<b>Power Jumpers</b>	Enable or disable power from the evaluation board.
25	<b>Charge LED</b>	Indicate LiPo is charging.

Particle devices are certified for use only with specific cellular antennas that connect to the U.FL connector on the module. Using an alternate antenna via the SMA connector (11) will require a lengthy and expensive recertification process.

## POWERING THE BOARD

The B-Series Eval Board can be powered by:

Num	Description
1	VIN barrel connector 5-12 VDC (5.5mm x 2.1mm, center positive)
2	LiPo battery (3.7V LiPo with JST-PH connector)
3	USB Micro B ("SOM USB")

- There are two USB Micro B connectors on the eval board, be sure to use connector 3 "SOM USB".
- The B524/B523 require a LiPo battery when powering by USB due to the higher current requirements of 2G/3G. The B404X/B404/B402 (LTE Cat M1) can be powered by USB without a battery.
- When powering by VIN (barrel connector), 5-12 VDC is recommended, but up to 17 VDC can be supplied.
- Minimum power requirements are 5VDC @500mA (when using the LiPo battery) or 5VDC @2000mA (without LiPo battery).
- If purchasing a LiPo battery from a 3rd-party supplier, beware as the polarity of the JST-PH connector is not standardized and may be reversed. Permanent damage to the eval board can occur if powered by reverse polarity on the JST connector. See the [battery guide](#) for additional information.
- This board is not recommended for use with the M-SoM, however it can be used if you power it using the VIN barrel connector with a 12 watt power supply, 6V minimum.

## JUMPERS J12

These pins are intended to be connected across using removable two-pin jumpers to connect features on the board to standard ports.

Feature	Feature Pin	SoM Pin	B-Series Pin
MicroSD	SD_MI	MISO	MISO
	SD_CK	SCK	SCK
	SD_MO	MOSI	MOSI
	SD_CS1	PWM1	D5
	SD_DECT	PWM2	D6
D7 LED	USER	PWM3	D7
	GND	GND	GND

These pins are intended to be connected across using removable two-pin jumpers to connect features on the board to standard ports.

B-Series Pin	SoM Pin	Feature Pin	Feature
	UB_USB_N	UB_USB_N	u-blox USB
	UB_USB_P	UB_USB_N	
	USB_DET	UB_VBUS	
D8	CS	ETH_CS	Ethernet
SCK	SCK	ETH_CLK	
MISO	MISO	ETH_MISO	
MOSI	MOSI	ETH_MOSI	
D22	GPIO0	ETH_INT	
A6	ADC6	PM_INT	Fuel Gauge & PMIC
D0	SDA	PM_SDA	PMIC
D1	SCL	PM_SCL	PMIC

For more information about Ethernet, see the application note [AN037 Ethernet](#).

POWER JUMPERS

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Jumper	Name
J5	SOM_VCC
J31	SOM_3V3



## PWM DIFFERENCES

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On the B-Series SoM, pins D4, D5, D7, A0, A1, A6, and A7 can be used for PWM. Pins are assigned a PWM group. Each group must share the same frequency and resolution, but individual pins in the group can have a different duty cycle.

- Group 2: Pins A0, A1, A6, and A7.
- Group 1: Pins D4, D5, and D6.
- Group 0: Pin D7 and the RGB LED. This must use the default resolution of 8 bits (0-255) and frequency of 500 Hz.

On Gen 3 Feather devices (Argon, Boron, Xenon), pins A0, A1, A2, A3, D2, D3, D4, D5, D6, D7, and D8 can be used for PWM. Pins are assigned a PWM group. Each group must share the same frequency and resolution, but individual pins in the group can have a different duty cycle.

- Group 3: Pins D2, D3, A4, and A5.
- Group 2: Pins A0, A1, A2, and A3.
- Group 1: Pins D4, D5, D6, and D8.
- Group 0: Pin D7 and the RGB LED. This must use the default resolution of 8 bits (0-255) and frequency of 500 Hz.

These rules also apply to `tone()` (square wave with 50% duty cycle), however since each group must share the same frequency you can only generate two different simultaneous tones of different frequencies on the B-Series SoM. You cannot generate tone on group 0.

# Basic setup

The basic setup for the B series to be operational is shown below:

- Plug the cellular antenna into the U.FL connector labeled **CELL** on the SoM. Remember never to power up this board without the antenna being connected. There is potential to damage the transmitter of the u-blox module if no antenna is connected.
- If you are going to use mobile app setup or BLE, connect the 2.4 GHz antenna (the smaller one) to the **BT** U.FL connector on the SoM.
- Connect power the USB (3) or a LiPo battery (4).
- Turn on the appropriate power switches (5).

## USING THE PMIC AND FUEL GAUGE (RECOMMENDED)

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There is support for bq24195 PMIC and MAX17043 fuel gauge in Device OS so you don't need to add any additional configuration.

PMIC	nRF52 Pin	SoM Pin	SoM Pin Number
PM_INT	P0.05	A6	45
PM_SDA	P1.13	D0	22
PM_SCL	P1.15	D1	20

It requires these jumpers, which should be installed at the factory:

- ADC6 to PM\_INT
- SDA to PM\_SDA
- SCL to PM\_SCL

If you are not using the PMIC be sure to remove the jumper if you need use pin A6 as an analog input or GPIO.

## POWER CONSUMPTION

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We do not recommend using the B-Series eval board for power consumption measurements. It's impossible to completely disconnect the Wiznet W5500 Ethernet interface without removing the chip from the board. This will result in significantly higher power consumption measurements than you would have in most applications.

## USING THE MICROSD CARD

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To use the MicroSD card, you must add the jumpers for the SD\_ pins.

You will normally use this with the [SdFat](#) library.

With the jumpers installed, it will use the secondary SPI (SPI1) and pin D5 as the chip select. You cannot use D2, D3, D4, D5, and D6 as GPIO for your own (non-SD card) use.

Micro SD	nRF52 Pin	SoM Pin	SoM Pin Number
SD_MISO	P1.08	D4 / PWM0 / SPI1 MISO	66
SD_SCK	P1.02	D2 / RTS / SPI1 SCK	42
SD_MOSI	P1.01	D3 / CTS / SPI1 MOSI	40

SD_CS	P1.10	D5 / PWM1	68
SD_DET	P1.11	D6 / PWM2	70

Note that SD\_DET (D6 / PWM2) is an output. It's pulled high with a 47K resistor and driven low by a mechanical switch when a SD card is inserted. Be sure to remove the jumper if you are using D6 as regular GPIO.

## USING ETHERNET

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To use Ethernet, you must add the jumpers:

- CS to ETH\_CS
- SCK to ETH\_SCK
- MISO to ETH\_MISO
- MOSI to ETH\_MOSI
- GPIO0 to ETH\_INT

With the jumpers installed, it will use the primary SPI and pins D8 as the chip select and D22 as the interrupt pin. You cannot use pins D8, D20, D22, or primary SPI (MISO, MOSI, SCK) as GPIO for your own (non-Ethernet) use. You can share SPI with other SPI peripherals that have libraries that correctly implement SPI transactions.

W5500	nRF52 Pin	SoM Pin	SoM Pin Number
ETH_CS	P1.03	D8	48
ETH_MISO	P1.14	D11 / SPI MISO	50
ETH_SCK	P1.15	D13 / SPI SCK	54
ETH_MOSI	P1.13	D12 / SPI MOSI	52
RST_N	P0.02	A7 (D20)	47
ETH_INT	P0.24	D22	62

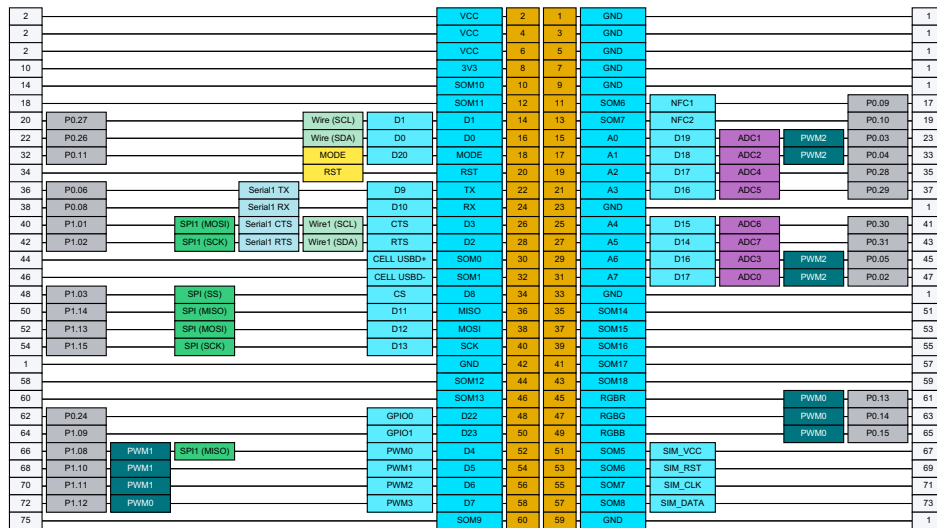
## USING THE GROVE CONNECTORS

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J11	nRF52 Pin	SoM Pin	SoM Pin Number
GND			
3V3			
ADC2	P0.28	A2	35
ADC1	P0.04	A1	33

J10	nRF52 Pin	SoM Pin	SoM Pin Number
GND			
3V3			
SDA	P1.13	D0	22
SCL	P1.15	D1	20

# Expansion header



## LABELS

Note that some of the SOM labels on the M.2 eval board do not match the schematic net names. These are mostly NC pins or a trivial difference, so the difference should not be noticeable.

Pin	Name	Description	Label	Net
10	SOM10	Not currently used, leave unconnected.	SOM0	SOM10
12	SOM11	Not currently used, leave unconnected.	SOM1	SOM11
15	A0	A0 Analog in, GPIO, PWM	A0	ADC0
17	A1	A1 Analog in, GPIO, PWM	A1	ADC1
19	A2	A2 Analog in, GPIO	A2	ADC2
21	A3	A3 Analog in, GPIO	A3	ADC3
25	A4	A4 Analog in, GPIO	A4	ADC4
27	A5	A5 Analog in, GPIO	A5	ADC5
29	A6	A6 Analog in, PWM, GPIO	A6	ADC6
30	SOM0	Cellular Modem USB Data+.	SOM2	SOM0
31	A7	A7 Analog in, GPIO	A7	ADC7
32	SOM1	Cellular Modem USB Data-.	SOM3	SOM1
36	MISO	SPI MISO, GPIO	MISO	MISO
44	SOM12	M.2 pin 58. Not currently used, leave unconnected.	SOM4	SOM12
45	RGBR	RGB LED Red	R	RED
46	SOM13	M.2 pin 60. Not currently used, leave unconnected.	SOM5	SOM13
47	RGBG	RGB LED Green	G	GREEN
49	RGBB	RGB LED Blue	B	BLUE
51	SOM5	Leave unconnected. External SIM support is not available on B-SoM.	SOM13	SOM5
53	SOM6	Leave unconnected. External SIM support is not available on B-SoM.	SOM14	SOM6
55	SOM7	Leave unconnected, 1.8V/3V SIM Clock Output from R410M.	SOM15	SOM7
57	SOM8	Leave unconnected. External SIM support is not available on B-SoM.	SOM16	SOM8
60	SOM9	M.2 pin 75. Not currently used, leave unconnected.	SOM17	SOM9

- **Pin:** Pin number

- **Name:** Short name, often the name used in Device OS for MCU GPIO pins
- **Label:** The label on the M.2 eval board
- **Net:** The net name on the schematic

FULL DETAILS

1 GND

Details	
Pin Number	1
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

2 VCC

Details	
Pin Number	2
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V
M.2 connector pin number	2

3 GND

Details	
Pin Number	3
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

4 VCC

Details	
Pin Number	4
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V
M.2 connector pin number	2

5 GND

Details	
Pin Number	5
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

6 VCC

Details	
Pin Number	6
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V

**7 GND**

Details	
Pin Number	7
Pin Name	GND
Description	Ground.
M.2 connector pin number 1	

**8 3V3**

Details	
Pin Number	8
Pin Name	3V3
Description	3.3V used to power MCU
M.2 connector pin number 10	

**9 GND**

Details	
Pin Number	9
Pin Name	GND
Description	Ground.
M.2 connector pin number 1	

**10 SOM10**

Details	
Pin Number	10
Pin Name	SOM10
Description	Not currently used, leave unconnected.
M.2 connector pin number 14	

**11 SOM6**

Details	
Pin Number	11
Pin Name	SOM6
Pin Alternate Name	NFC1
Description	NFC Antenna 1.
MCU Pin	P0.09
M.2 connector pin number 17	

**12 SOM11**

Details	
Pin Number	12
Pin Name	SOM11
Description	Not currently used, leave unconnected.
M.2 connector pin number 18	

### 13 SOM7

#### Details

Pin Number	13
Pin Name	SOM7
Pin Alternate Name	NFC2
Description	NFC Antenna 2. NFC2 is the center pin.
MCU Pin	P0.10
M.2 connector pin number	19

### 14 D1

#### Details

Pin Number	14
Pin Name	D1
Pin Alternate Name	D1
Description	I2C SCL. Cannot be used as GPIO.
Supports digitalRead	Yes
Supports digitalWrite	Yes
I2C interface	SCL. Use Wire object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.27
M.2 connector pin number	20

### 15 A0

#### Details

Pin Number	15
Pin Name	A0
Pin Alternate Name	D19
Description	A0 Analog in, GPIO, PWM
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.
Internal pull resistance	13K
MCU Pin	P0.03
M.2 connector pin number	23

### 16 D0

#### Details

Pin Number	16
Pin Name	D0
Pin Alternate Name	D0
Description	I2C SDA. Cannot be used as GPIO.



Supports digitalRead	Yes
Supports digitalWrite	Yes
I2C interface	SDA. Use Wire object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.26
M.2 connector pin number	22

## 17 A1

### Details

Pin Number	17
Pin Name	A1
Pin Alternate Name	D18
Description	A1 Analog in, GPIO, PWM
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.
Internal pull resistance	13K
MCU Pin	P0.04
M.2 connector pin number	33

## 18 MODE

### Details

Pin Number	18
Pin Name	MODE
Pin Alternate Name	D20
Description	MODE button, has internal pull-up
MCU Pin	P0.11
M.2 connector pin number	32

## 19 A2

### Details

Pin Number	19
Pin Name	A2
Pin Alternate Name	D17
Description	A2 Analog in, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.28

M.2 connector pin number 35

## 20 RST

### Details

Pin Number	20
Pin Name	RST
Description	Hardware reset, active low.

M.2 connector pin number 34

## 21 A3

### Details

Pin Number	21
Pin Name	A3
Pin Alternate Name	D16
Description	A3 Analog in, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.29

M.2 connector pin number 37

## 22 TX

### Details

Pin Number	22
Pin Name	TX
Pin Alternate Name	D9
Description	Serial TX, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	TX. Use Serial1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.06

M.2 connector pin number 36

## 23 GND

### Details

Pin Number	23
Pin Name	GND
Description	Ground.

M.2 connector pin number 1

## 24 RX

**Details**

Pin Number	24
Pin Name	RX
Pin Alternate Name	D10
Description	Serial RX, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	RX. Use Serial1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.08
M.2 connector pin number	38

**25 A4****Details**

Pin Number	25
Pin Name	A4
Pin Alternate Name	D15
Description	A4 Analog in, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.30
M.2 connector pin number	41

**26 D3****Details**

Pin Number	26
Pin Name	D3
Pin Alternate Name	CTS
Description	SPI1 MOSI, Serial1 CTS, GPIO, Wire1 SCL
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	CTS. Use Serial1 object.
SPI interface	MOSI. Use SPI1 object.
I2C interface	SCL. Use Wire1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.01
M.2 connector pin number	40

**27 A5****Details**

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Pin Number	27
Pin Name	A5
Pin Alternate Name	D14
Description	A5 Analog in, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.31
M.2 connector pin number	43

## 28 D2

### Details

Pin Number	28
Pin Name	D2
Pin Alternate Name	RTS
Description	SPI1 SCK, Serial11 RTS, PWM, GPIO, Wire1 SDA
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	RTS. Use Serial11 object.
SPI interface	SCK. Use SPI1 object.
I2C interface	SDA. Use Wire1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.02
M.2 connector pin number	42

## 29 A6

### Details

Pin Number	29
Pin Name	A6
Pin Alternate Name	D16
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.
Internal pull resistance	13K
MCU Pin	P0.05
M.2 connector pin number	45

## 30 SOM0

**Details**

Pin Number	30
Pin Name	SOM0
Pin Alternate Name	CELL USBD+
Description	Cellular Modem USB Data+.
Input is 5V Tolerant	Yes
M.2 connector pin number	44

**31 A7****Details**

Pin Number	31
Pin Name	A7
Pin Alternate Name	D17
Description	A7 Analog in, 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.
Internal pull resistance	13K
MCU Pin	P0.02
M.2 connector pin number	47

**32 SOM1****Details**

Pin Number	32
Pin Name	SOM1
Pin Alternate Name	CELL USBD-
Description	Cellular Modem USB Data-.
Input is 5V Tolerant	Yes
M.2 connector pin number	46

**33 GND****Details**

Pin Number	33
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

**34 D8****Details**

Pin Number	34
Pin Name	D8
Pin Alternate Name	CS

Description	GPIO, SPI SS
Supports digitalRead	Yes
Supports digitalWrite	Yes
SPI interface	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.
Internal pull resistance	13K
MCU Pin	P1.03
M.2 connector pin number	48

### 35 SOM14

#### Details

Pin Number	35
Pin Name	SOM14
Description	M.2 pin 51. Not currently used, leave unconnected.
M.2 connector pin number	51

### 36 MISO

#### Details

Pin Number	36
Pin Name	MISO
Pin Alternate Name	D11
Description	SPI MISO, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
SPI interface	MISO. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.14
M.2 connector pin number	50

### 37 SOM15

#### Details

Pin Number	37
Pin Name	SOM15
Description	M.2 pin 53. Not currently used, leave unconnected.
M.2 connector pin number	53

### 38 MOSI

#### Details

Pin Number	38
Pin Name	MOSI
Pin Alternate Name	D12
Description	SPI MOSI, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes

SPI interface	MOSI. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.13
M.2 connector pin number	52

### 39 SOM16

#### Details

Pin Number	39
Pin Name	SOM16
Description	M.2 pin 55. Not currently used, leave unconnected.
M.2 connector pin number	55

### 40 SCK

#### Details

Pin Number	40
Pin Name	SCK
Pin Alternate Name	D13
Description	SPI SCK, GPIO
Supports digitalRead	Yes
Supports digitalWrite	Yes
SPI interface	SCK. Use SPI object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.15
M.2 connector pin number	54

### 41 SOM17

#### Details

Pin Number	41
Pin Name	SOM17
Description	M.2 pin 57. Not currently used, leave unconnected.
M.2 connector pin number	57

### 42 GND

#### Details

Pin Number	42
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

### 43 SOM18

#### Details

Pin Number	43
Pin Name	SOM18

Description	M.2 pin 59. Not currently used, leave unconnected.
M.2 connector pin number	59

#### 44 SOM12

Details	
Pin Number	44
Pin Name	SOM12
Description	M.2 pin 58. Not currently used, leave unconnected.
M.2 connector pin number	58

#### 45 RGBR

Details	
Pin Number	45
Pin Name	RGBR
Description	RGB LED Red
MCU Pin	P0.13
M.2 connector pin number	61

#### 46 SOM13

Details	
Pin Number	46
Pin Name	SOM13
Description	M.2 pin 60. Not currently used, leave unconnected.
M.2 connector pin number	60

#### 47 RGBG

Details	
Pin Number	47
Pin Name	RGBG
Description	RGB LED Green
MCU Pin	P0.14
M.2 connector pin number	63

#### 48 D22

Details	
Pin Number	48
Pin Name	D22
Pin Alternate Name	GPIO0
Description	GPIO D22
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P0.24
M.2 connector pin number	62



## 49 RGBB

Details	
Pin Number	49
Pin Name	RGBB
Description	RGB LED Blue
MCU Pin	P0.15
M.2 connector pin number	65

## 50 D23

Details	
Pin Number	50
Pin Name	D23
Pin Alternate Name	GPIO1
Description	GPIO D23
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.09
M.2 connector pin number	64

## 51 SOM5

Details	
Pin Number	51
Pin Name	SOM5
Pin Alternate Name	SIM_VCC
Description	Leave unconnected. External SIM support is not available on B-SoM.
M.2 connector pin number	67

## 52 D4

Details	
Pin Number	52
Pin Name	D4
Pin Alternate Name	PWM0
Description	SPI1 MISO, PWM, GPIO D4
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogWrite (PWM)	Yes
Supports tone	D4, D5, and D6 must have the same frequency.
SPI interface	MISO. Use SPI1 object.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.08
M.2 connector pin number	66

## 53 SOM6

### Details

Pin Number	53
Pin Name	SOM6
Pin Alternate Name	SIM_RST
Description	Leave unconnected. External SIM support is not available on B-SoM.
M.2 connector pin number	69

## 54 D5

### Details

Pin Number	54
Pin Name	D5
Pin Alternate Name	PWM1
Description	PWM, GPIO D5
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogWrite (PWM)	Yes
Supports tone	D4, D5, and D6 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.10
M.2 connector pin number	68

## 55 SOM7

### Details

Pin Number	55
Pin Name	SOM7
Pin Alternate Name	SIM_CLK
Description	Leave unconnected, 1.8V/3V SIM Clock Output from R410M.
M.2 connector pin number	71

## 56 D6

### Details

Pin Number	56
Pin Name	D6
Pin Alternate Name	PWM2
Description	PWM, GPIO D6
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogWrite (PWM)	Yes
Supports tone	D4, D5, and D6 must have the same frequency.
Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Internal pull resistance	13K
MCU Pin	P1.11
M.2 connector pin number	70

57 SOM8

Details	
Pin Number	57
Pin Name	SOM8
Pin Alternate Name	SIM_DATA
Description	Leave unconnected. External SIM support is not available on B-SoM.
M.2 connector pin number	73

58 D7

Details	
Pin Number	58
Pin Name	D7
Pin Alternate Name	PWM3
Description	PWM, GPIO D7, Blue LED
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogWrite (PWM)	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.
Internal pull resistance	13K
MCU Pin	P1.12
M.2 connector pin number	72

59 GND

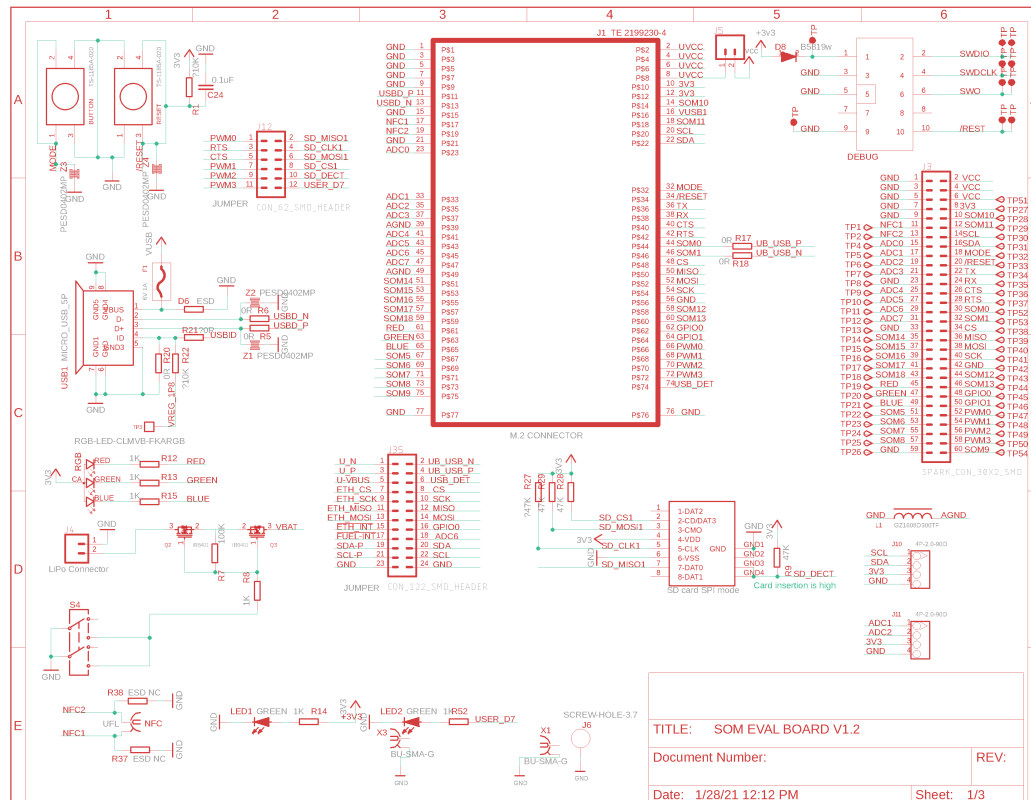
Details	
Pin Number	59
Pin Name	GND
Description	Ground.
M.2 connector pin number	1

60 SOM9

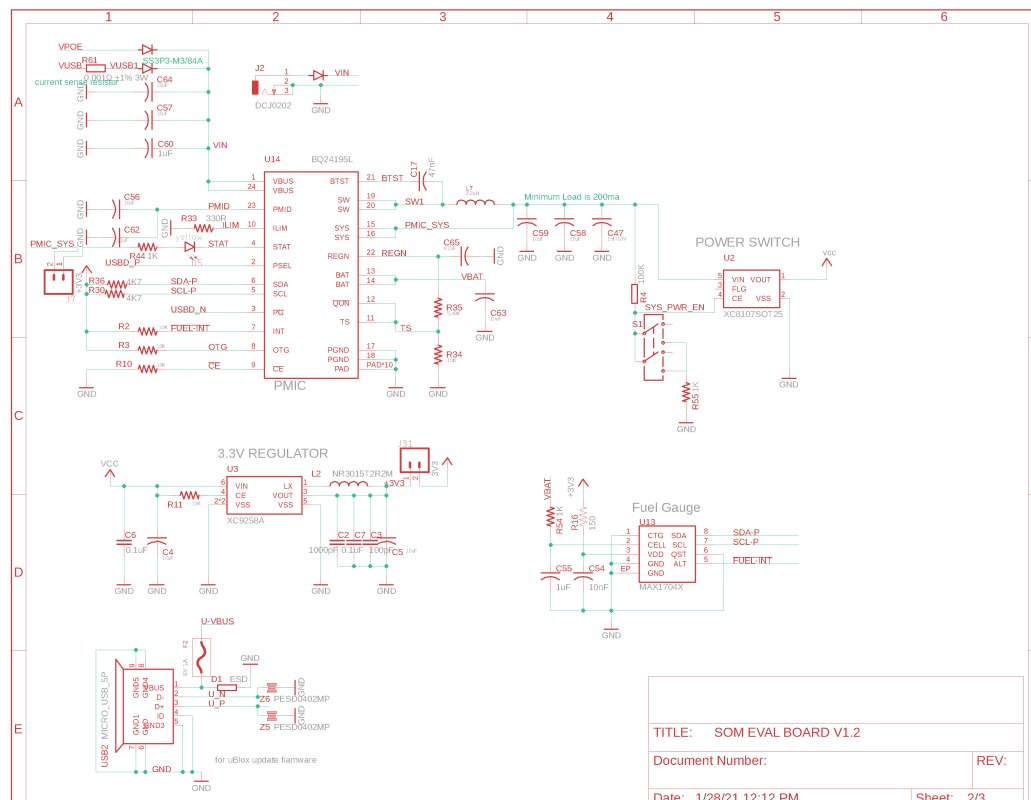
Details	
Pin Number	60
Pin Name	SOM9
Description	M.2 pin 75. Not currently used, leave unconnected.
M.2 connector pin number	75

# Evaluation board schematics

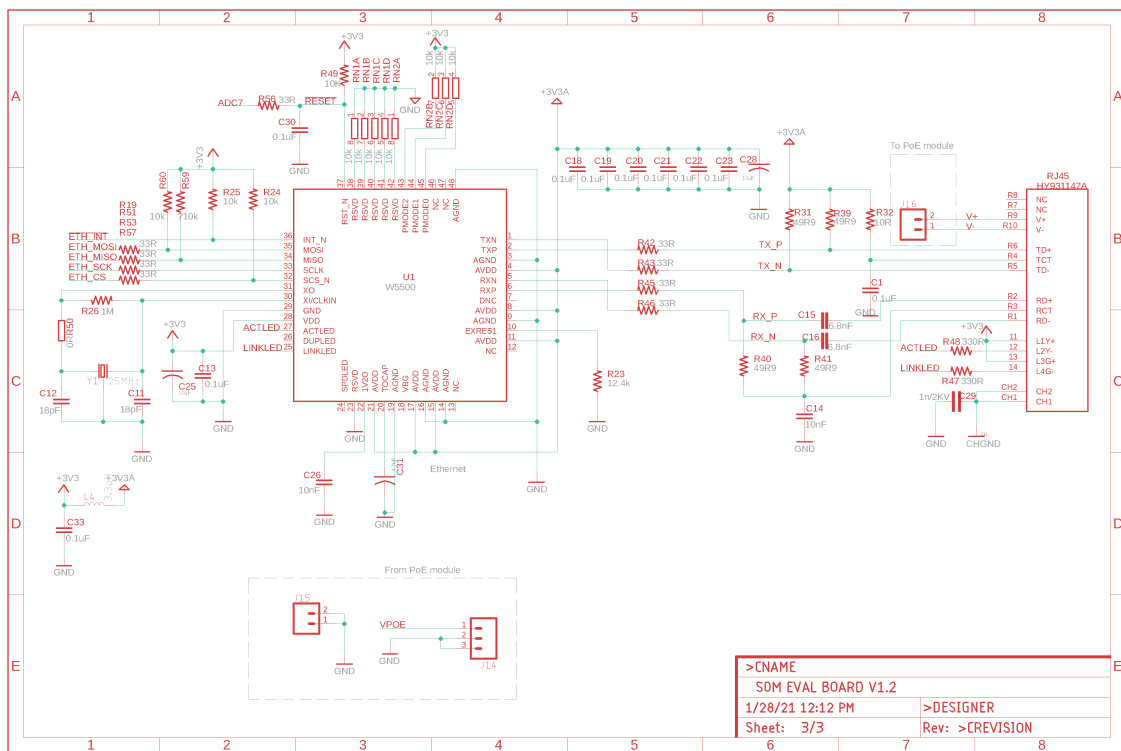
## PAGE 1



## PAGE 2



## PAGE 3



# Mechanical specifications

## DIMENSIONS AND WEIGHT

Parameter		Value
Width		91 mm
Length		142.5 mm
Thickness		15.5 mm
Weight		71.8 grams (including PoE module)

## Revision history

Revision	Date	Author	Comments
001	29 Apr 2019	RK	Initial Release
002	21 Jan 2020	RK	Remove mesh
003	3 Feb 2020	RK	Correct pins for SD card
004	20 Jul 2022	RK	Correct pins for SD and Ethernet SPI, which are SPI not SPII
005	9 Sep 2022	RK	Correct length
006	19 Jan 2023	RK	Correct pins for SD card for version 1.2 board
007	26 Oct 2023	RK	Updated pin diagrams
008	04 Apr 2024	RK	Added M-SoM note