B523 Datasheet (pre)

This is a preliminary datasheet and is subject to change

Functional description

The B Series System-on-a-Module (SoM) is a LTE Cat 1 cellular device with support for BLE (Bluetooth LE). It is based on the Nordic nRF52840 micro-controller.

The B Series is designed to be integrated into your circuit board design, plugging a M.2 NGFF connector on your board, allowing the module to be changed or upgraded easily.

FEATURES

- Quectel EG91-E modem
    - LTE category 1 module for EMEA region
    - 3GPP E-UTRA Release 11
    - Cat 1 bands supported: 1, 3, 7, 8, 20, 28A
- Nordic Semiconductor nRF52840 SoC
    - ARM Cortex-M4F 32-bit processor @ 64MHz
    - 1MB flash, 256KB RAM
    - Bluetooth 5: 2 Mbps, 1 Mbps, 500 Kbps, 125 Kbps
    - Supports DSP instructions, HW accelerated Floating Point Unit (FPU) calculations
    - ARM TrustZone CryptoCell-310 Cryptographic and security module
    - Up to +8 dBm TX power (down to -20 dBm in 4 dB steps)
    - NFC-A tag
- On-module additional 8MB SPI flash
- 24 mixed signal GPIO (8 x Analog, 4 x PWM), UART, I2C, SPI
- USB 2.0 full speed (12 Mbps)
- JTAG (SWD) pins
- RGB status pins for LED
- Reset and Mode pins for buttons
- On-module MFF2 Particle SIM
- Two on-module U.FL connectors for external antennas
- M.2 interface
- CE certified
- RoHS compliant (lead-free)

Interfaces

VCC

VCC is used to supply power to the Quectel EG91-E cellular module. The recommended input voltage range on this pin is between 3.6V to 4.3V DC. Make sure that the supply can handle currents of at least 2 A.

Note: The limit on the B402 (u-blox LTE Cat M1) is 4.2V, so you should limit VCC to 4.2V to preserve compatibility with both modules.

3V3

3V3 is used to supply power to nRF52840, logic ICs, memory, etc. and 3.3v is recommended. VCC input voltage range is between 3V to 3.6V DC. Make sure that the supply can handle currents of at least 150mA.

VBus

VBus is connected to the USB detect pin of nRF52840 to enables the USB interface. The recommended input voltage range is between 4.35V to 5.5V DC.

ANTENNA

There are two radios on the B523 module. A BLE radio (nRF52840) and a cellular radio (Quectel). We have provided two u.FL connectors to plug in the cellular and BLE antenna. These are required if you wish to use the cellular and BLE. If you do not need BLE, you do not need to connect the BLE antenna.

- The antenna placement needs to follow some basic rules, as any antenna is sensitive to its environment. Mount the antenna at least 10mm from metal components or surfaces, ideally 20mm for best radiation efficiency, and try to maintain a minimum of three directions free from obstructions to be able to operate effectively.
- Needs tuning with actual product enclosure and all components.
- For the BLE antenna, it is recommended to use a 2.4 GHz single-frequency antenna and not a 2.4 GHz + 5 GHz antenna, so as to avoid large gain at the frequency twice of 2.4 GHz which can cause the second harmonic radiation of 2.4 GHz to exceed standards.

PERIPHERALS AND GPIO

Peripheral Type	Qty	Input(I) / Output(O)
Digital	24 (max)	I/O
Analog (ADC)	8 (max)	I
UART	1	I/O
SPI	2	I/O
I2C	2	I/O
USB	1	I/O
PWM	7 (max)	O
NFC	1	O

There are some optional B523 module specific I/O:

- Quectel USB and VBUS (for modem firmware upgrades)
- Quectel Ring Indicator (RI) output

Note: All GPIOs are only rated at 3.3VDC max.

JTAG AND SWD

The B523 module has 4 pads at the bottom exposing the SWD interface of the nRF52840. This interface can be used to debug your code or reprogram your E402 bootloader, device OS, or the user firmware. We use 4 pogo-pins connecting to these pads during production for firmware flashing.

Memory map

NRF52840 FLASH LAYOUT OVERVIEW

- Bootloader (48KB, @0xF4000)
- User Application (128KB, @0xD4000)
- System (656KB, @0x30000)
- SoftDevice (192KB)

EXTERNAL SPI FLASH LAYOUT OVERVIEW (DFU OFFSET: 0X80000000)

- Reserved (4MB, @0x0040000)
- OTA (1500KB, @0x00289000)
- Reserved (420KB, @0x00220000)
- FAC (128KB, @0x00200000)
- LittleFS (2M, @0x00000000)

Pins and button definitions

PINOUT DIAGRAM

	PARTICLE MESH SOM			
	EG91-E CAT-1 SOM			
		H1	H3	
		H5		
VCC		2	1	GND
VCC		4	3	GND
VCC		6	5	GND
VCC		8	7	GND
3V3		10	9	GND
3V3		12	11	USB D+
RESERVED		14	13	USB D-
VUSB		16	15	GND
		18	17	NFC1
SCL		20	19	NFC2
SDA		22	21	GND
	KEY		23	ADC0
MODE		32	33	ADC1
RESET		34	35	ADC2
TX		36	37	ADC3
RX		38	39	AGND
CTS		40	41	ADC4
RTS		42	43	ADC5
EG91 USB+		44	45	ADC6
EG91 USB-		46	47	ADC7
CS		48	49	AGND
MISO		50	51	RESERVED
MOSI		52	53	RESERVED
SCK		54	55	RESERVED
GND		56	57	RESERVED
RESERVED		58	59	RESERVED
RESERVED		60	61	RED
GPIO0		62	63	GREEN
GPIO1		64	65	BLUE
PWM0		66	67	SIM_VCC
PWM1		68	69	SIM_RST
PWM2		70	71	SIM_CLK
PWM3		72	73	SIM_DATA
EG91 VBUS		74	75	EG91_RI
		H2	H4	

Pins SOM0 to SOM9 will vary across various SoM modules. For example, cellular-specific pins exists in this range.

Additionally there are reserved pins, whose functions vary depending on the SoM. For example, nRF52 MCU-based modules use some of these pins for additional ADC and GPIO.

For maximum cross-module flexibility, you should try to use only the common pins when possible.

PIN DESCRIPTION

#	Pin	Common	Function	nRF52	Description
1	GND	GND	POWER		System ground.
2	VCC	VCC[5]	POWER		System power in, connect to the +LiPo or supply a fixed 3.6-4.3v power.
3	GND	GND	POWER		System ground.
4	VCC	VCC	POWER		System power in, connect to the +LiPo or supply a fixed 3.6-4.3v power.
5	GND	GND	POWER		System ground.
6	VCC	VCC	POWER		System power in, connect to the +LiPo or supply a fixed 3.6-4.3v power.
7	GND	GND	POWER		System ground.
8	VCC	VCC	POWER		System power in, connect to the +LiPo or supply a fixed 3.6-4.3v power.
9	GND	GND	POWER		System ground.
10	3V3	3V3	POWER		System power in, supply a fixed 3.0-3.6v power.
11	USB D+	USB D+	IO		Data+ pin of the NRF52840 USB port.

12	3V3	3V3	POWER		System power in, supply a fixed 3.0-3.6v power.
13	USB D-	USB D-	IO		Data- pin of the NRF52840 USB port.
14	NC	RESERVED[3]	NC		Leave unconnected.
15	GND	GND	POWER		System ground.
16	VUSB	VUSB	POWER		System power in, USB detect pin for nRF52840. 5V on this pin enables the USB interface.
17	NFC1	SOM3[3]	NFC input	P0.9	NFC antenna connection.
18	NC	RESERVED[3]	NC		Leave unconnected.
19	NFC2	SOM4[3]	NFC input	P0.10	NFC antenna connection.
20	D1	SCL	IO	P0.27	I2C SCL, and digital only GPIO.
21	GND	GND	POWER		System ground.
22	D0	SDA	IO	P0.26	I2C SDA, and digital only GPIO.
23	A0	ADC0	IO	P0.3	Analog input ADC0[2], and digital GPIO.
32	MODE	MODE	IO	P0.11	Connected to the MODE button input, and digital only GPIO.
33	A1	ADC1	IO	P0.4	Analog input ADC1[2], and digital GPIO.
34	RESET	RESET	I		Active-low reset input.
35	A2	ADC2	IO	P0.28	Analog input ADC2[2], and digital GPIO.
36	D9	TX	IO	P0.6	Primarily used as UART TX, but can also be used as a digital GPIO.
37	A3	ADC3	IO	P0.29	Analog input ADC3[2], and digital GPIO.
38	D10	RX	IO	P0.08	Primarily used as UART RX, but can also be used as a digital GPIO.
39	AGND	AGND	POWER		System analog ground.
40	D3	RESERVED[3]	IO	P1.1	UART flow control interface CTS, SCL1 (Wire1), SPI1 MOSI, and digital only GPIO.
41	A4	RESERVED[3]	IO	P0.30	Analog input ADC4[2], and digital GPIO.
42	D2	RESERVED[3]	IO	P1.2	UART flow control interface RTS, SDA1 (Wire1), SPI1 SCK, and digital only GPIO.
43	A5	RESERVED[3]	IO	P0.31	Analog input ADC5[2], and digital GPIO.
44	Quectel USB D+	SOM0	IO		Data+ pin of the R410M USB port.
45	A6	RESERVED[3]	IO	P0.5	Analog input ADC6[2], and digital GPIO.
46	Quectel USB D-	SOM1	IO		Data- pin of the R410M USB port.
47	A7	RESERVED[3]	IO	P0.2	Analog input ADC7[2], and digital GPIO.
48	D8	CS	IO	P1.3	SPI interface CS, and digital only GPIO.
49	AGND	AGND	POWER		System analog ground.
50	D11	MISO	IO	P1.14	SPI interface MISO, and digital only GPIO.
51	NC	RESERVED[3]	NC		Leave unconnected.
52	D12	MOSI	IO	P1.13	SPI interface MOSI, and digital only GPIO.
53	NC	RESERVED[3]	NC		Leave unconnected.
54	D13	SCK	IO	P1.15	SPI interface SCK, and digital only GPIO.
55	NC	RESERVED[3]	NC		Leave unconnected.
56	GND	GND	POWER		System analog ground.
57	NC	RESERVED[3]	NC		Leave unconnected.

58	NC	RESERVED[3]	NC		Leave unconnected.
59	NC	RESERVED[3]	NC		Leave unconnected.
60	NC	RESERVED[3]	NC		Leave unconnected.
61	RGBR	RED	IO	P0.13	Red pin of the RGB LED.
62	D22	GPIO0	IO	P0.24	GPIO0, digital only.
63	RGBG	GREEN	IO	P0.14	Green pin of the RGB LED.
64	D23	GPIO1	IO	P1.9	GPIO1, digital only.
65	RGBB	BLUE	IO	P0.15	Blue pin of the RGB LED.
66	D4	PWM0	IO	P1.8	SPI1 MISO, Digital only GPIO, and PWM0.
67	SIM_VCC[1]	SOM5[3]	POWER		Leave unconnected, 1.8V/3V SIM Supply Output from R410M.
68	D5	PWM1	IO	P1.10	Digital only GPIO, and PWM1.
69	SIM_RST[1]	SOM6[3]	IO		Leave unconnected, 1.8V/3V SIM Reset Output from R410M.
70	D6	PWM2	IO	P1.11	Digital only GPIO, and PWM2.
71	SIM_CLK[1]	SOM7[3]	IO		Leave unconnected, 1.8V/3V SIM Clock Output from R410M.
72	D7	PWM3	IO	P1.12	Digital only GPIO, and PWM3.
73	SIM_DATA[1]	SOM8[3]	IO		Leave unconnected, 1.8V/3V SIM Data I/O of R410m with internal 4.7 k pull-up.
74	Quectel VBUS	SOM2[3]	IO		USB detect pin for R410M. 5V on this pin enables the Quectel USB interface.
75	Quectel RI	SOM9[4]	IO		Ring indicator

[1]These pins are connected to the internal MFF2 SIM and should be left open.

[2]A0-A7 are 12-bit Analog-to-Digital (A/D) inputs (0-4095).

[3]SoM-specific and Reserved pins will vary depending on module.

[4]RI is available on the B523 (Quectel) but not on the B402 (u-blox LTE M1)

[5]The VCC maximum is 4.3V on the B523 (Quectel) but is 4.2V on the B402 (u-blox LTE M1). For compatibility across modules, limit this to 4.2V.

LED STATUS

System RGB LED

Unlike the Boron, the B523 module does not have an on-module RGB system status LED. We have provided its individual control pins for you to connect an LED of your liking. This will allow greater flexibility in the end design of your products.

A detailed explanation of different color codes of the RGB system LED can be found here.

Technical specifications

ABSOLUTE MAXIMUM RATINGS [1]

Supply voltages

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltages					
Supply Input Voltage	VCC	-0.3		+4.7	V
Supply Input Voltage	3V3	-0.3		+3.9	V
VBUS USB supply voltage	VUSB	-0.3		+5.8	V
I/O pin voltage					
VI/O, VDD ≤ 3.6 V	IO	-0.3		VDD + 0.3	V
VI/O, VDD > 3.6 V	IO	-0.3		+3.9	V
NFC antenna pin current					
$I_{NFC1/2}$	NFC1/NFC2			80	mA
Radio					
BT RF input level (52840)				10	dBm
Environmental					
Storage temperature		-40		+85	°C

[1] Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under recommended operating conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltages					
Supply Input Voltage	VCC	+3.6	+3.8	+4.3	V
Supply Input Voltage	3V3	+3.0	+3.3	+3.6	V
VBUS USB supply voltage	VUSB	+4.35	+5.0	+5.5	V
Environmental					
Normal operating temperature[1]		-20	+25	+75[3]	°C
Extended operating temperature[2]		-40		+85	°C
Humidity Range Non condensing, relative humidity				95	%

Notes:

[1] Normal operating temperature range (fully functional and meet 3GPP specifications).

[2] Extended operating temperature range (RF performance may be affected outside normal operating range, though module is fully functional)

[3] The maximum operating temperature is 75°C on the B523 (Quectel) but is 65°C on the B402 (u-blox LTE M1). For compatibility across modules, limit this to 65°C.

Boron has two radio modules.

nRF52840

- Bluetooth® 5, 2.4 GHz
  - 95 dBm sensitivity in 1 Mbps Bluetooth® low energy mode
  - 103 dBm sensitivity in 125 kbps Bluetooth® low energy mode (long range)
  - 20 to +8 dBm TX power, configurable in 4 dB steps

4G LTE cellular characteristics for EG91-E

Parameter	Value
Protocol stack	3GPP Release 13
RAT	LTE Cat 1
LTE FDD Bands	Band 28A (700 MHz)
	Band 20 (800 MHz)
	Band 8 (900 MHz)
	Band 3 (1800 MHz)
	Band 1 (2100 MHz)
	Band 7 (2600 MHz)
WCDMA Bands	Band 8 (900 MHz)
	Band 1 (2100)
GSM Bands	EGSM900 (900 MHz)
	DCS1800 (1800 MHz)
Power class	Class 4 (33dBm ± 2dB) for EGSM900
	Class 1 (30dBm ± 2dB) for DCS1800
	Class E2 (27dBm ± 3dB) for EGSM900 8-PSK
	Class E2 (26dBm ± 3dB) for DCS1800 8-PSK
	Class 3 (24dBm ± 3dB) for WCDMA bands
	Class 3 (23dBm ± 2dB) for LTE FDD bands

I/O CHARACTERISTICS

These specifications are based on the nRF52840 datasheet.

Symbol	Parameter	Min	Typ	Max	Unit
VIH	Input high voltage	0.7 xVDD		VDD	V
VIL	Input low voltage	VSS		0.3 xVDD	V
VOH,SD	Output high voltage, standard drive, 0.5 mA, VDD ≥1.7	VDD - 0.4		VDD	V
VOH,HDH	Output high voltage, high drive, 5 mA, VDD >= 2.7 V	VDD - 0.4		VDD	V
VOH,HDL	Output high voltage, high drive, 3 mA, VDD >= 1.7 V	VDD - 0.4		VDD	V
VOL,SD	Output low voltage, standard drive, 0.5 mA, VDD ≥1.7	VSS		VSS + 0.4	V
VOL,HDH	Output low voltage, high drive, 5 mA, VDD >= 2.7 V	VSS		VSS + 0.4	V
VOL,HDL	Output low voltage, high drive,3 mA, VDD >= 1.7 V	VSS		VSS + 0.4	V
IOL,SD	Current at VSS+0.4 V, output set low, standard drive, VDD≥1.7	1	2	4	mA
IOL,HDH	Current at VSS+0.4 V, output set low, high drive, VDD >= 2.7V	6	10	15	mA
IOL,HDL	Current at VSS+0.4 V, output set low, high drive, VDD >= 1.7V	3			mA
IOH,SD	Current at VDD-0.4 V, output set high, standard drive, VDD≥1.7	1	2	4	mA
IOH,HDH	Current at VDD-0.4 V, output set high, high drive, VDD >= 2.7V	6	9	14	mA
IOH,HDL	Current at VDD-0.4 V, output set high, high drive, VDD >= 1.7V	3			mA
tRF,15pF	Rise/fall time, standard drivemode, 10-90%, 15 pF load[1]		9		ns
tRF,25pF	Rise/fall time, standard drive mode, 10-90%, 25 pF load[1]		13		ns
tRF,50pF	Rise/fall time, standard drive mode, 10-90%, 50 pF load[1]		25		ns
tHRF,15pF	Rise/Fall time, high drive mode, 10-90%, 15 pF load[1]		4		ns
tHRF,25pF	Rise/Fall time, high drive mode, 10-90%, 25 pF load[1]		5		ns
tHRF,50pF	Rise/Fall time, high drive mode, 10-90%, 50 pF load[1]		8		ns
RPU	Pull-up resistance	11	13	16	kΩ
RPD	Pull-down resistance	11	13	16	kΩ
CPAD	Pad capacitance		3		pF
CPAD_NFC	Pad capacitance on NFC pads		4		pF
INFC_LEAK	Leakage current between NFC pads when driven to different states		1	10	μA

[1]Rise and fall times based on simulations

Mechanical specifications

DIMENSIONS AND WEIGHT

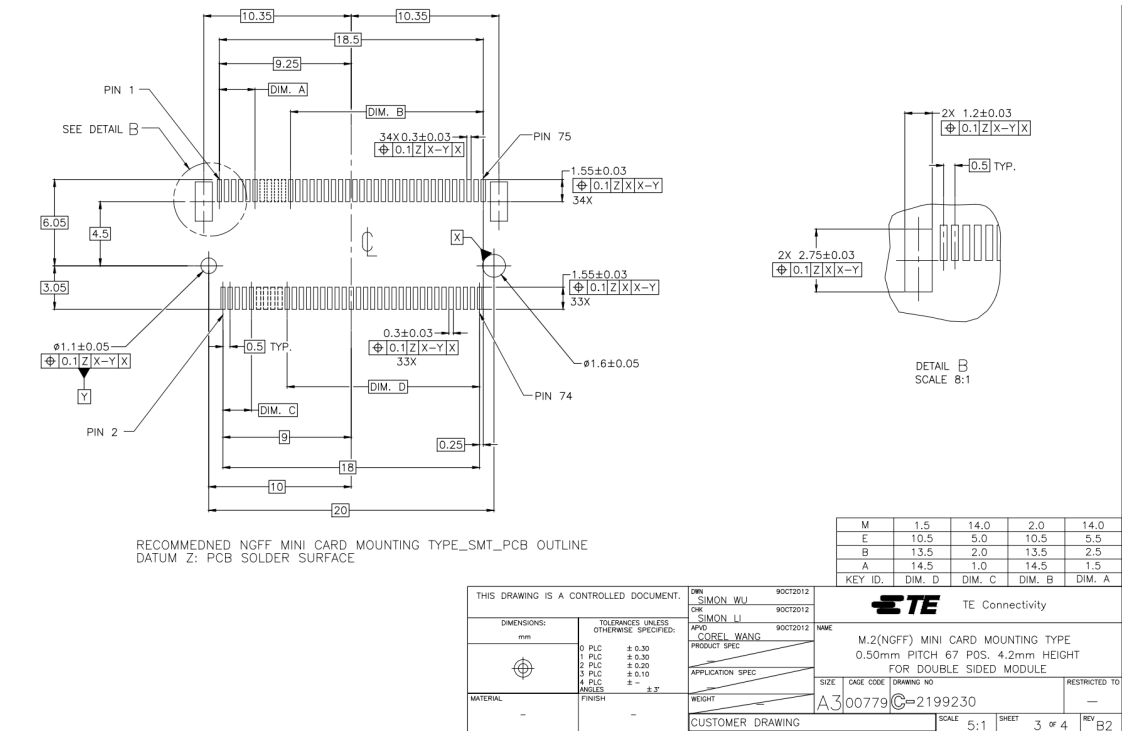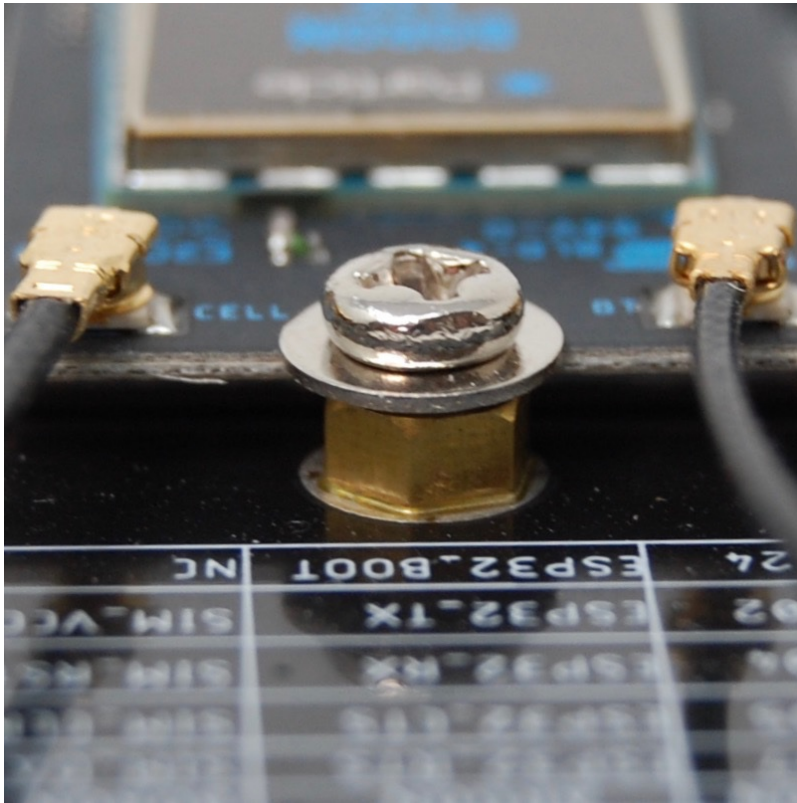| Parameters	Value	Unit
Width	30	mm
Height	42	mm
Thickness	5.5	mm
Weight	6.2	grams

MECHANICAL DRAWING
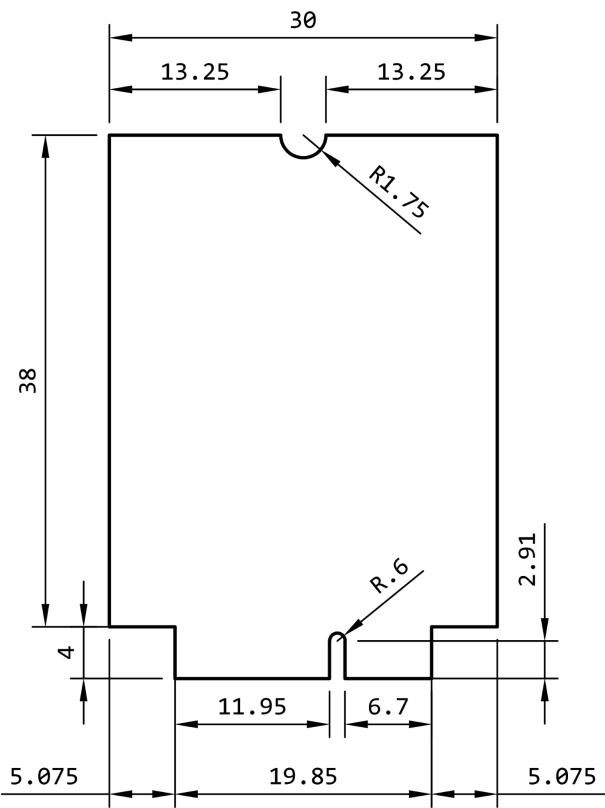
Dimensions are in millimeters.

MATING CONNECTOR AND LAND PATTERN

The mating connector is a an M.2 (NGFF) type 4. Note that there are several different key configurations for the M.2, and type 4 is different than is commonly used on SSDs.

One compatible connector is the TE 2199230-4. It is widely available including at suppliers such as DigiKey.

RECOMMEDNED NGFF MINI CARD MOUNTING TYPE_SMT_PCB OUTLINE
DATUM Z: PCB SOLDER SURFACE

KEY ID.	DIM. D	DIM. C	DIM. B	DIM. A
M	1.5	14.0	2.0	14.0
E	10.5	5.0	10.5	5.5
B	13.5	2.0	13.5	2.5
A	14.5	1.0	14.5	1.5

THIS DRAWING IS A CONTROLLED DOCUMENT.		DWN	SIMON WU	9OCT2012			TE Connectivity			
DIMENSIONS: mm	TOLERANCES UNLESS OTHERWISE SPECIFIED:	CHK	SIMON LI	9OCT2012	NAME	M.2(NGFF) MINI CARD MOUNTING TYPE 0.50mm PITCH 67 POS. 4.2mm HEIGHT FOR DOUBLE SIDED MODULE				
	0 PLC ±0.30	APVD	COREL WANG	9OCT2012						
	1 PLC ±0.30	PRODUCT SPEC								
	2 PLC ±0.20									
	3 PLC ±0.10	APPLICATION SPEC								
	4 PLC ± –			SIZE	CAGE CODE	DRAWING NO			RESTRICTED TO	
	ANGLES ±3°			A3	00779	C=2199230			–	
MATERIAL –	FINISH –	WEIGHT								
		CUSTOMER DRAWING				SCALE 5:1	SHEET 3 OF 4	REV B2		

We recommend this screw assembly to securely affix the B series SoM to your circuit board. From top to bottom:

- M3 screw, 3mm long
- M3 washer
- M3 standoff, 2.45mm
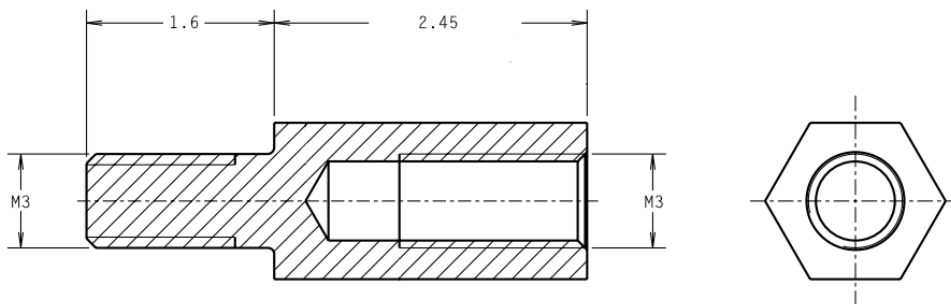
- Mounting hole, 2.6 mm metal hole, 3.1mm metal ring diameter (picture is of the bottom side of the circuit board)

- An alternative design uses a JAE SM3ZS067U410-NUT1-R1200 standoff. It's reflow soldered to your base board and has a threaded hole for a M2*3 screw to hold down the SoM. This may be easier to obtain.

- Note that a hold-down screw is required because the M.2 connector does not have integrated locks and the SoM will pop up if not attached to the base board.

DESIGN CONSIDERATIONS

We strongly recommend against placing components under the SOM board because there is not enough height.

30mm

Ø3mm

42mm

38mm

KEEP OUT
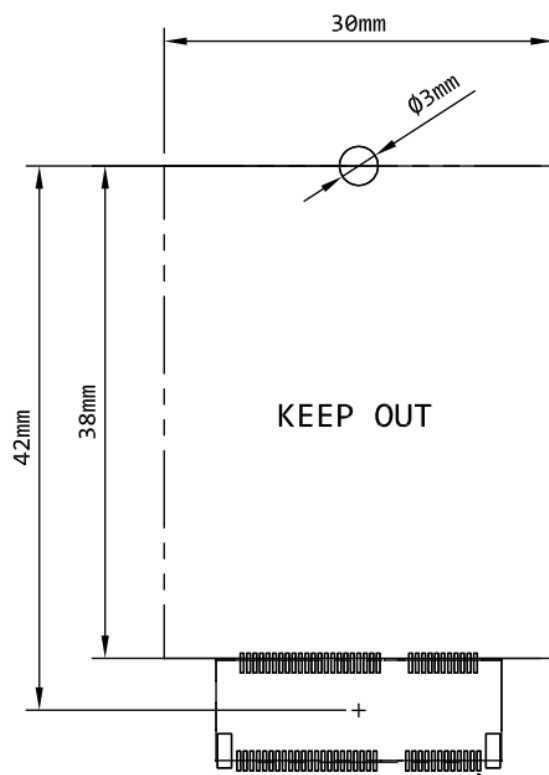
Product Handling

ESD PRECAUTIONS

The B series contains highly sensitive electronic circuitry and is an Electrostatic Sensitive Device (ESD). Handling an B series without proper ESD protection may destroy or damage it permanently. Proper ESD handling and packaging procedures must be applied throughout the processing, handling and operation of any application that incorporates the B series module. ESD precautions should be implemented on the application board where the B series is mounted. Failure to observe these precautions can result in severe damage to the B series!

CONNECTORS

The U.FL antenna connector is not designed to be constantly plugged and unplugged. The antenna pin is static sensitive and you can destroy the radio with improper handling. A tiny dab of glue (epoxy, rubber cement, liquid tape or hot glue) on the connector can be used securely hold the plug in place.
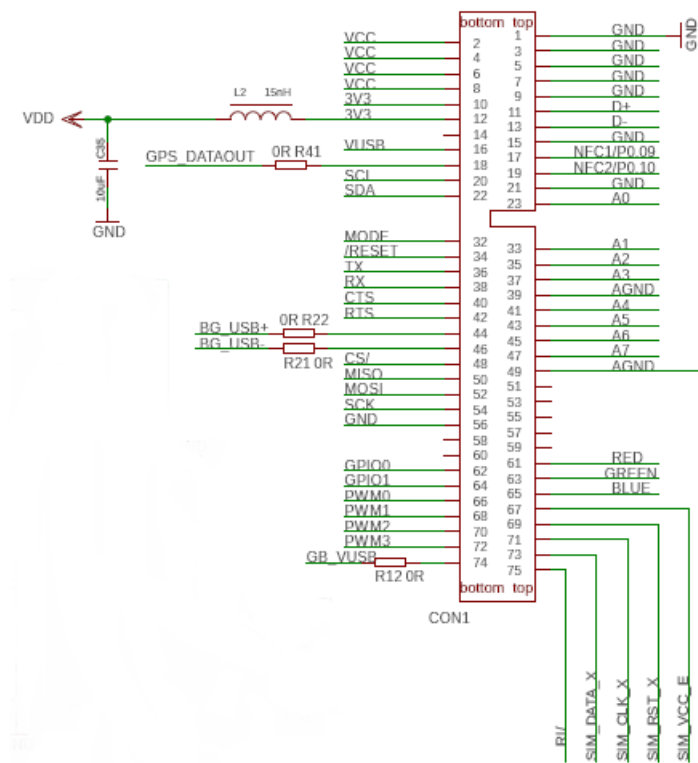
The M.2 edge connector is static sensitive and should be handled carefully. The M.2 connector is not designed for repeated removal and insertion of the module.
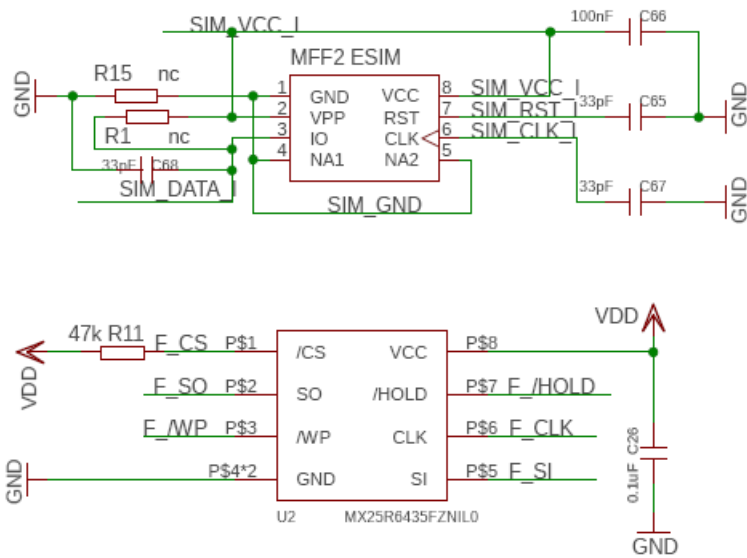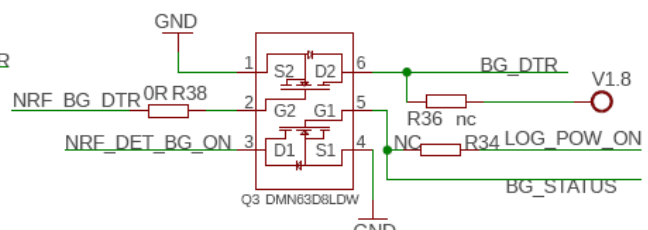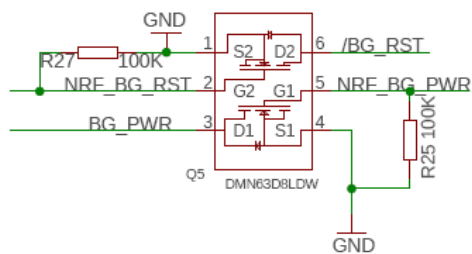
Schematics

MICROCONTROLLER

QUECTEL CELLULAR MODEM

EG91
GSM Module

To page 3 (Logic circuit)

TITLE: B500M-E SOM v0.03

M.2 CONNECTOR

CON1

bottom	top		
VCC	2	1	GND
VCC	4	3	GND
VCC	6	5	GND
VCC	8	7	GND
3V3	10	9	GND
3V3	12	11	D+
	14	13	D-
VUSB	16	15	GND
	18	17	NFC1/P0.09
SCL	20	19	NFC2/P0.10
SDA	22	21	GND
		23	A0
MODE	32	33	A1
/RESET	34	35	A2
TX	36	37	A3
RX	38	39	AGND
CTS	40	41	A4
RTS	42	43	A5
	44	45	A6
	46	47	A7
CS/	48	49	AGND
MISO	50	51	
MOSI	52	53	
SCK	54	55	
GND	56	57	
	58	59	
	60	61	RED
GPIO0	62	63	GREEN
GPIO1	64	65	BLUE
PWM0	66	67	
PWM1	68	69	
PWM2	70	71	
PWM3	72	73	
GB_VUSB	74	75	
bottom		top	

VDD — L2 15nH

GPS_DATAOUT — 0R R41

C35 10uF — GND

BG_USB+ — 0R R22
BG_USB- — R21 0R

GND (pin 1 far right)

R12 0R

SIM_DATA_X
SIM_CLK_X
SIM_RST_X
SIM_VCC_E

SIM AND FLASH

MFF2 ESIM

SIM_VCC_I   100nF C66

GND — R15 nc

1	GND	VCC	8	SIM_VCC_I
2	VPP	RST	7	SIM_RST_I	33pF C65
3	IO	CLK	6	SIM_CLK_I
4	NA1	NA2	5	

R1 nc

33pF C68

SIM_DATA_I

SIM_GND

33pF C67

GND

U2 MX25R6435FZNIL0

47k R11   F_CS P$1

	/CS	VCC	P$8		VDD
F_SO P$2	SO	/HOLD	P$7	F_/HOLD
F_/WP P$3	/WP	CLK	P$6	F_CLK
P$4*2	GND	SI	P$5	F_SI

VDD

0.1uF C26

GND

BUFFERS

VDD

LOG_POW_ON
to BG96

VIN VOUT
CE VSS
XC8102 U3
4
3
1
2*2

3.3V
C71 1uF
GND

GND

V1.8
0R R19

V1.8
C70 0.1uF GND

U4
VCCA VCCB
14
1 A1 B1 12
2 A2 B2 11
3 A3 B3 10
4 A4 B4 9
15 DIR1
16 DIR2
5 DIR3
6 DIR4
7 OE GND 8
SN74AVC4T774

BG_RTS
BG_TXD TP27
BG_CTS
BG_RXD TP31

13
NRF_CTS TP25
NRF_RX TP24
NRF_RTS TP26
NRF_TX TP23

GND

GND

VDD
C47 nc GND

U18 SN74LV1T34 nc
96_GPS_TX nc R2
91_GPS_TX nc R3
TX_GPS
VCC
5
2 A Y 4 GPS_DATAOUT
3 GND
GND

VDD
100K R20
R42 0R
RI/
A6
R5 NC
RI_BG 1
3
2 Q6
2SK3018
GND

GND
R27 100K
1 S2 D2 6 /BG_RST
NRF_BG_RST 2 G2 G1 5 NRF_BG_PWR
BG_PWR 3 D1 S1 4
Q5 DMN63D8LDW
R25 100K
GND

GND
1 S2 D2 6 BG_DTR
NRF_BG_DTR 0R R38
2 G2 G1 5
NRF_DET_BG_ON 3 D1 S1 4
Q3 DMN63D8LDW
R36 nc V1.8
NC R34 LOG_POW_ON
BG_STATUS
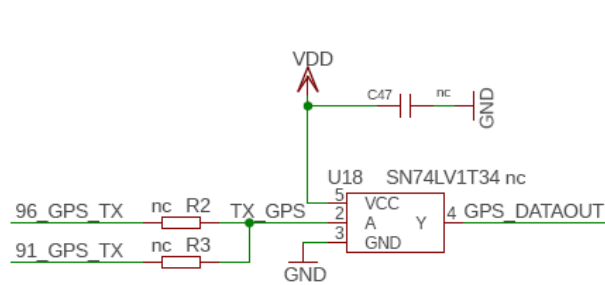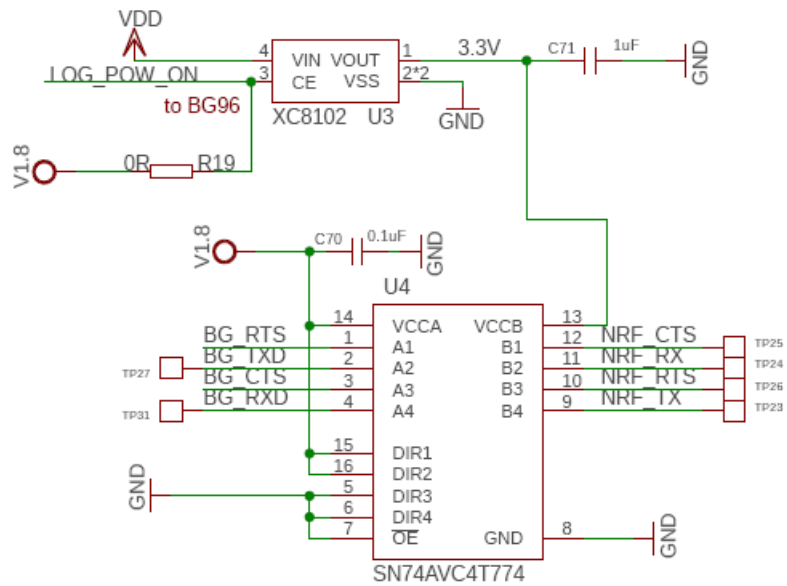GND

Default settings

The B series comes pre-programmed with a bootloader and a user application called Tinker. This application works with an iOS and Android app also named Tinker that allows you to very easily toggle digital pins, take analog and digital readings and drive variable PWM outputs.

The bootloader allows you to easily update the user application via several different methods, USB, OTA, Serial Y-Modem, and also internally via the Factory Reset procedure. All of these methods have multiple tools associated with them as well.

Revision history

Revision	Date	Author	Comments
pre	19 Mar 2020	RK	Preview Release