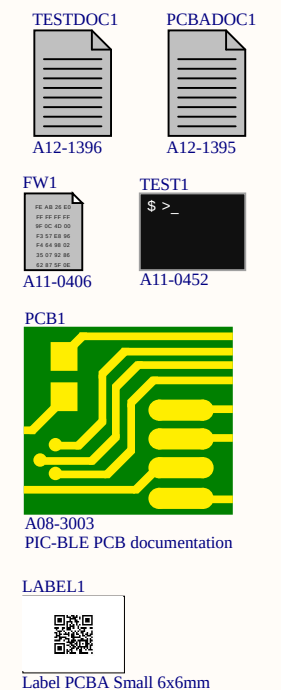
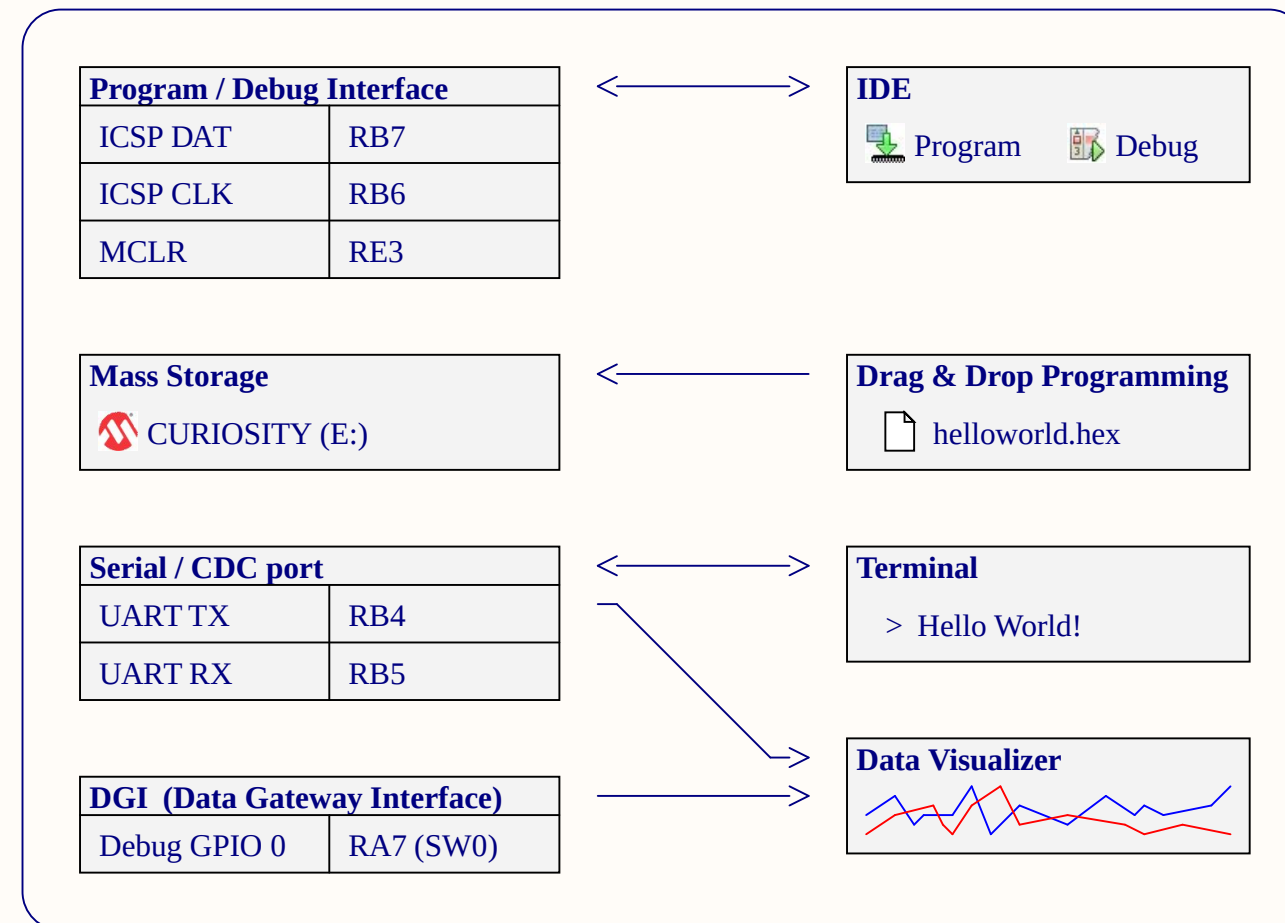
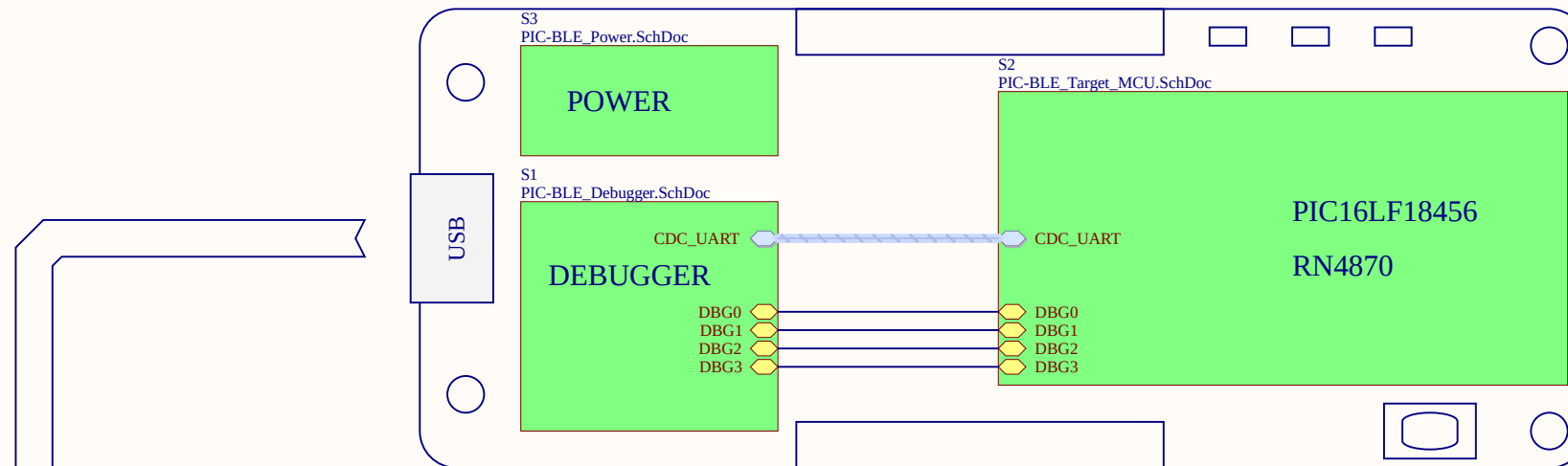
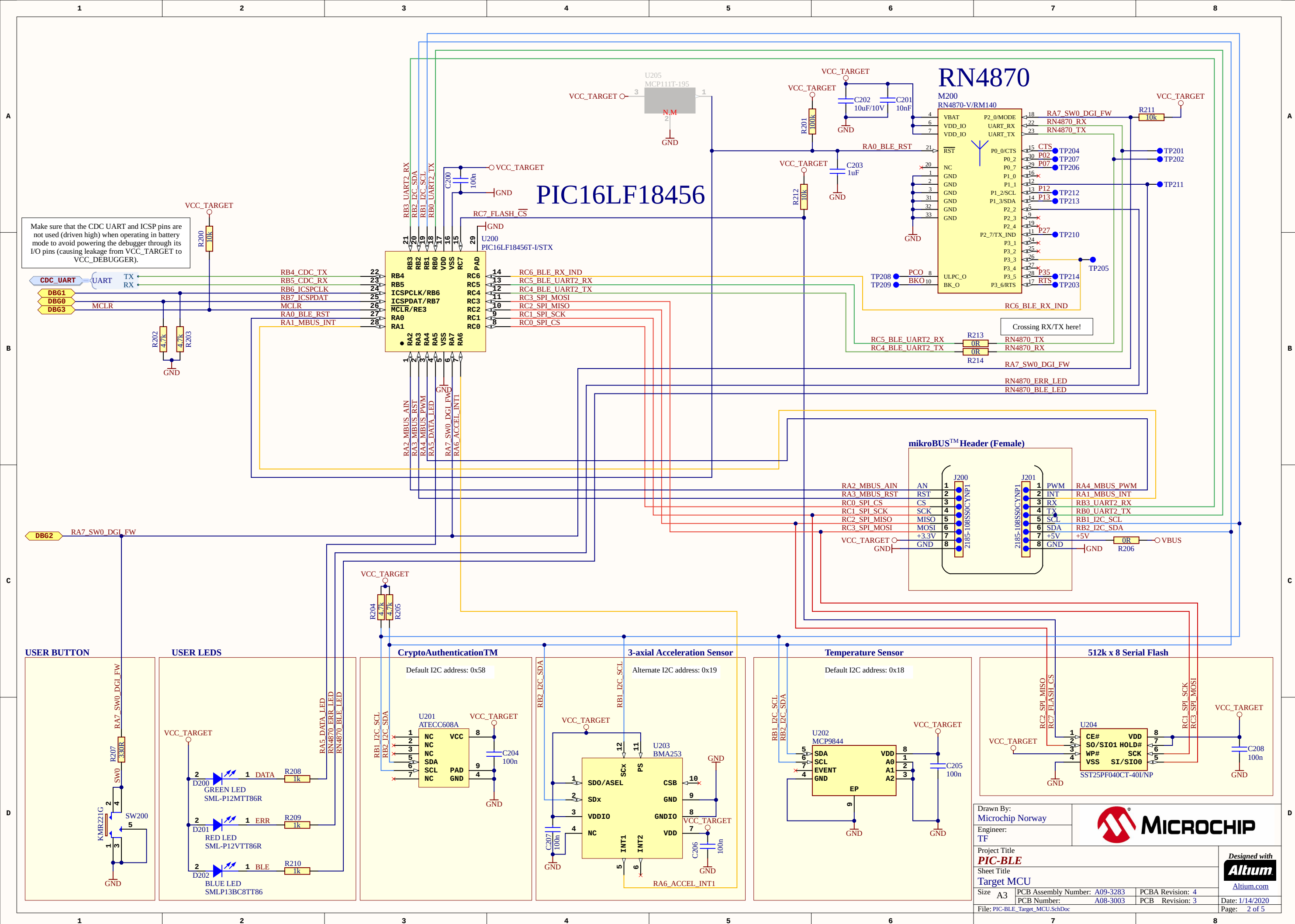
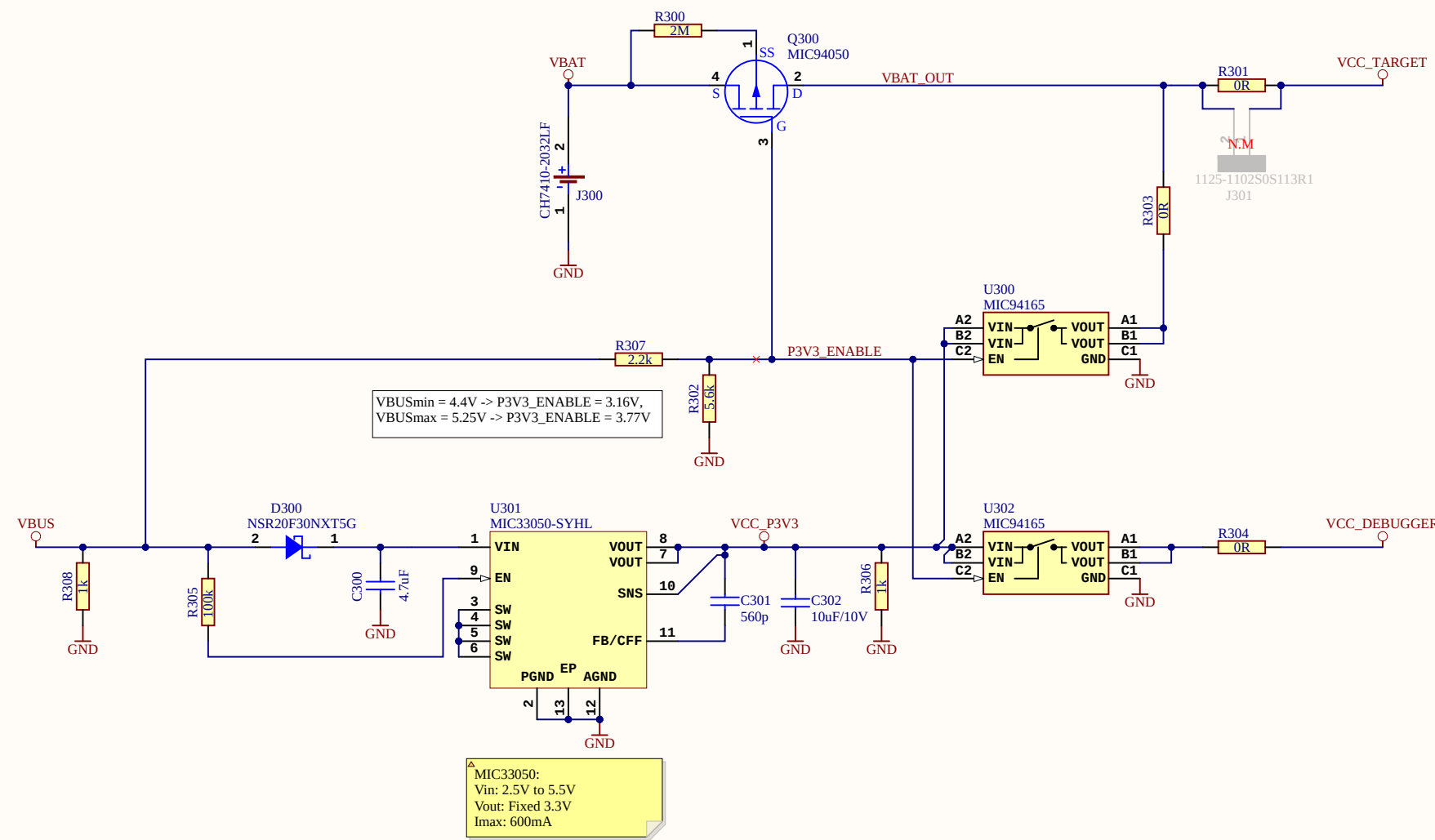


PIC-BLE

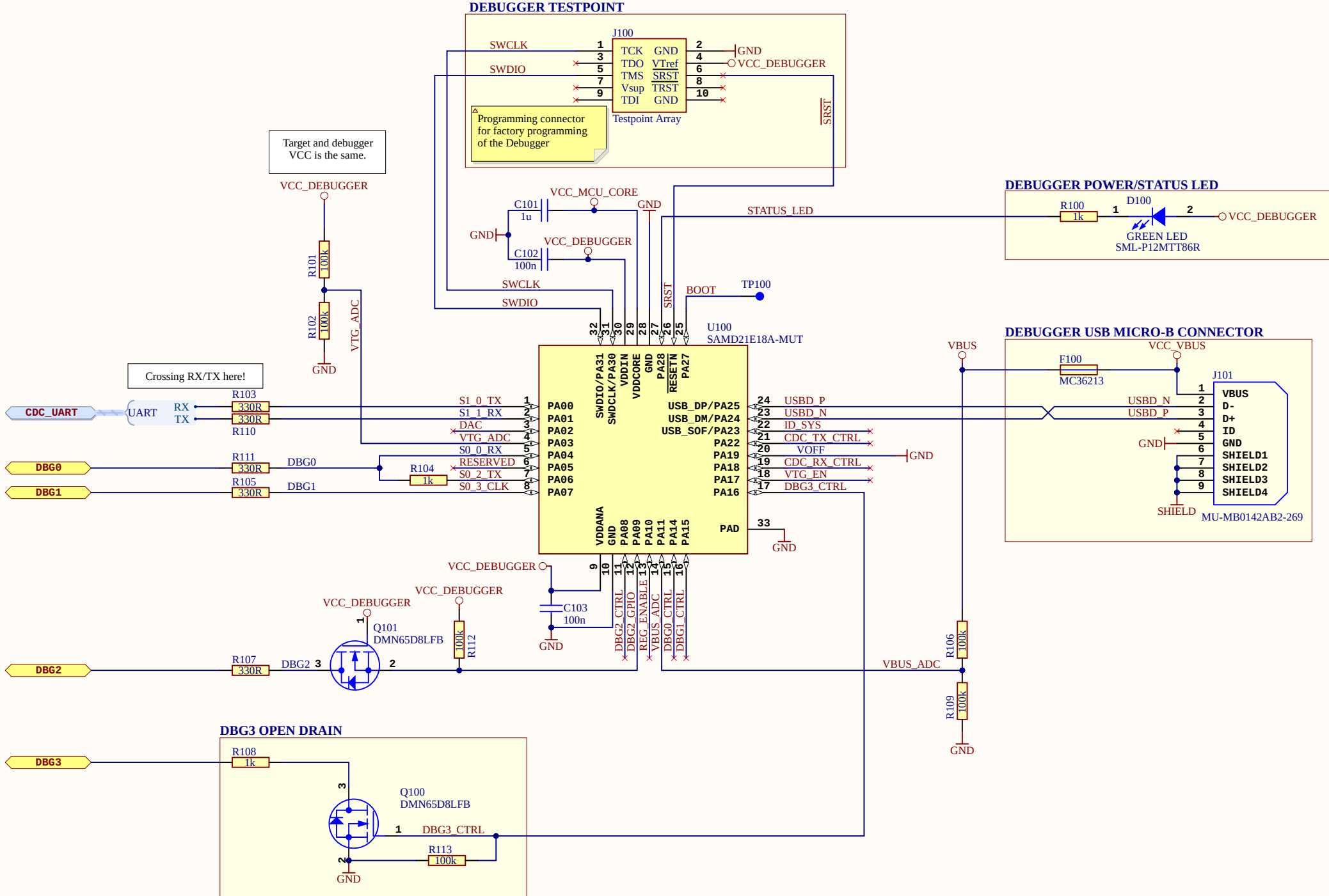




POWER



DEBUGGER



<i>Interface</i> <i>Signal</i>	ICSP TARGET
CDC TX	UART RX
CDC RX	UART TX
DBG0	DAT
DBG1	CLK
DBG2	GPIO
DBG3	$\overline{\text{MCLR}}$
VCC	-

Revision History

PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

PCB Assembly Rev 2:

Design Changes:

- Changed RN4871 to a RN4870

- Changed name of product to PIC-BLE

- Added diode and voltage divider for switch enable and MOSFET gate control

PCB:

PCB revision 2

PCB Assembly Rev 3:

Design Changes:

- Removed 100nF cap on RESET for U100: SAMD21

- Added 100k pull-down on gate on Q100

- Added Level-shifter on DBG2 to prevent leakage from VCC_TARGET

- Added 0-ohm resistors on UART lines to RN4870 module

- Added footprint for MCP111T-195 on reset line to RN4870 module

- Changed ERR and BLE LED psotions to match standard.

PCB:

PCB revision 3

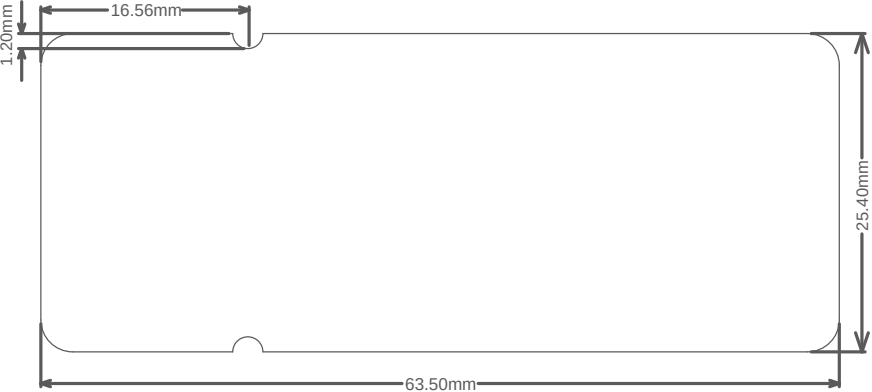
PCB Assembly Rev 4:

Design Changes:

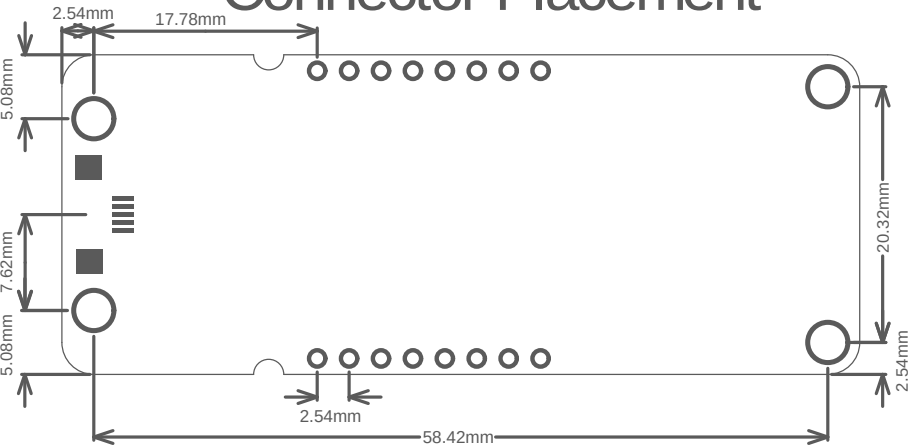
- Changed RN4870 to rev 1.40

PCB:

PCB revision 2



Connector Placement



GND

D300
R305
C300

I SNS

J301

U301

C301
C302
R306
R301

R303

U205

R308
R302
R307

F100

R304

Q300

R300

J101

POWER

DEBUGGER

R113

Q100

R108

R200

R106

R109

Q101

R112

C103

R105

R202

D100

R100

C101

C102

U100

R103

R110

R102

R101

R111

R104

R203
R107

GND

J201

PWM
RA4INT
RA1RX
RB3TX
RB0SCL
RB1SDA
RB2

5V

GND

R206

C204

U201

R204

R205

C200

U200

U203

C207

U202

C205

C206

U204

C208

R212

PIC16LF18456

R201

C203

mikro BUS

RA2

RA3

RC0

RC1

RC2

RC3

AN

RST

CS

SCK

SD0

SDI

3V3

GND

J200

TX R214

RX R213

RN4870 BLUETOOTH LE

R211

R207

SW200

SWO
GNDD200
R208D201
R209

ERR

D202
R210

BLE

C202
C201

GND

SST25P040C

PIC-BLE[®]

M200

GND

BOOT

GND

PCB A
LABEL



J100

TP100

CR2032

J300

CR2032

Microchip © 2019

A08-3003 Rev3

®

GND

TP208 TP209 TP210 TP211 TP212 TP213 TP214

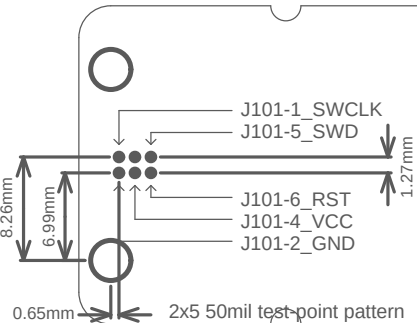
PC0 BK0 P27 P11 P12 P13 P35

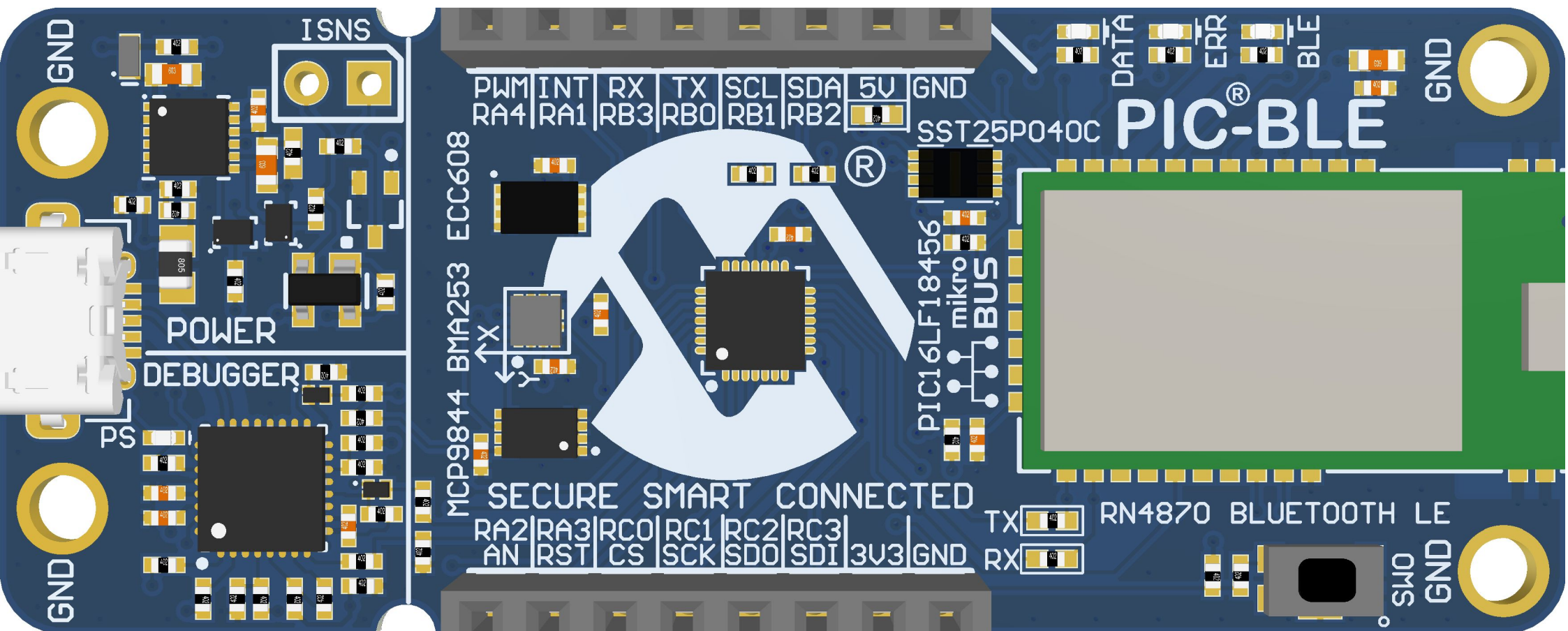
GND

TP207 TP206 TP205 TP204 TP203 TP202 TP201

RXD TXD RTS CTS P33 P07 P02

Test Point Placement





GND

I2S

PWM INT RX TX SCL SDA 5V GND
RA4 RA1 RB3 RB0 RB1 RB2

SST25P040C

DATA

ERR

BLE

GND

PIC-BLE®

POWER

DEBUGGER

PS

GND

MCP9844 BMA253 ECC608

SECURE SMART CONNECTED

RA2 RA3 RCO RC1 RC2 RC3
AN RST CS SCK SDO SDI 3V3 GND

PIC16LF18456

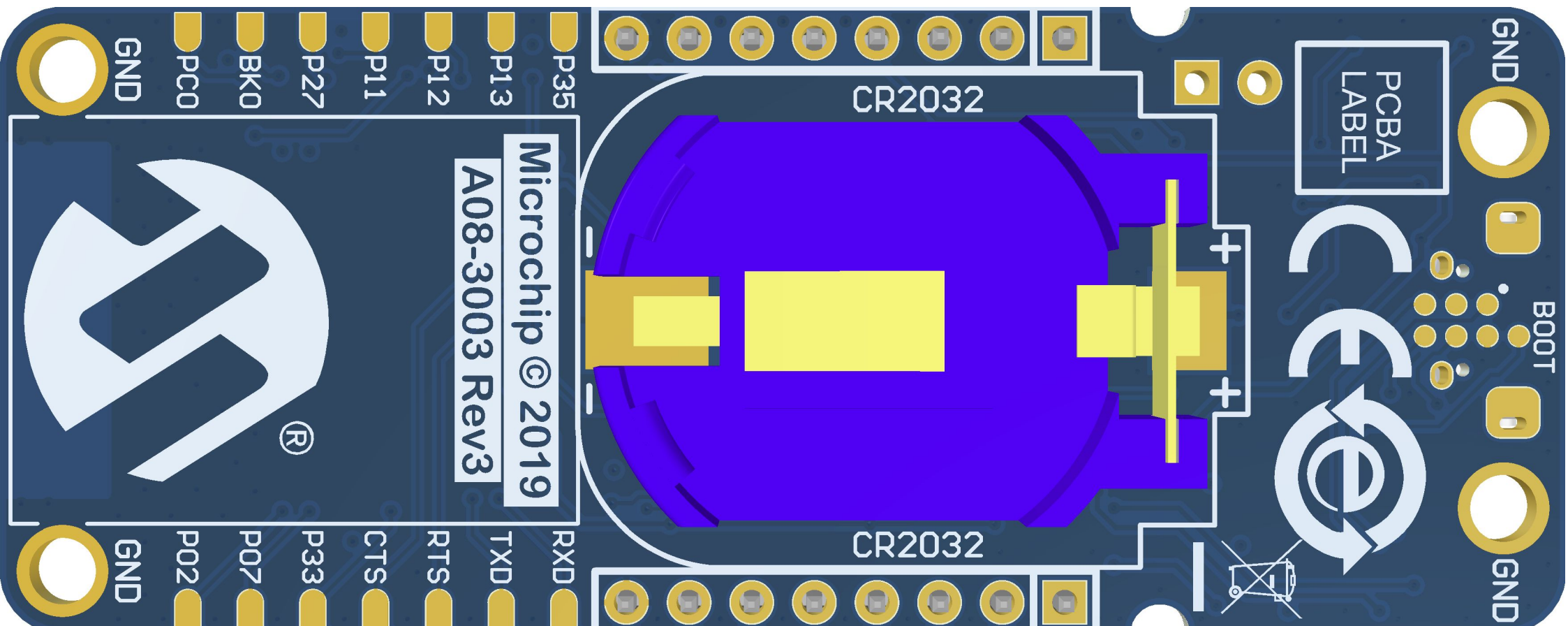
mikro
BUS

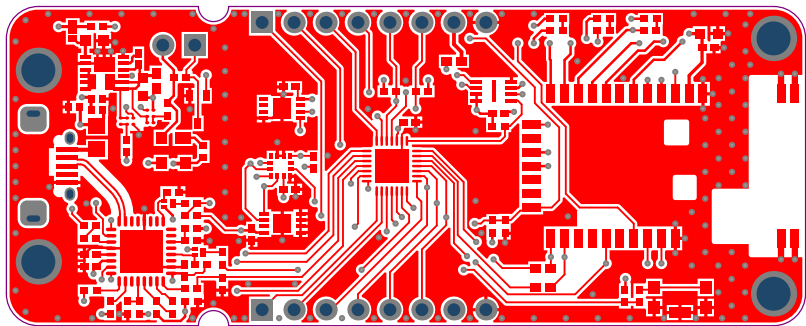
TX
RX

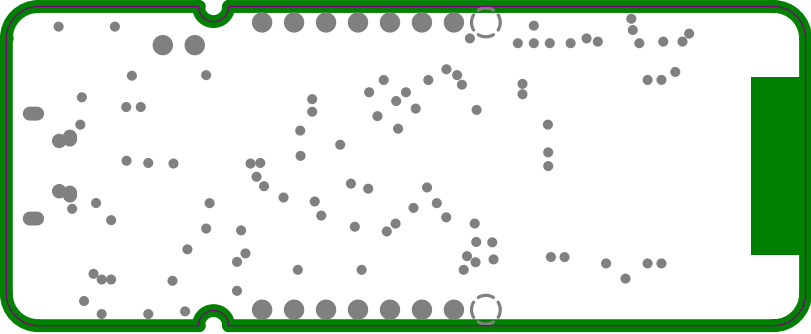
RN4870 BLUETOOTH LE

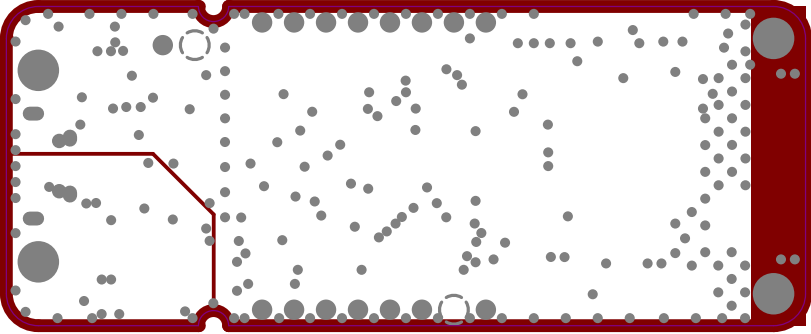
SMD

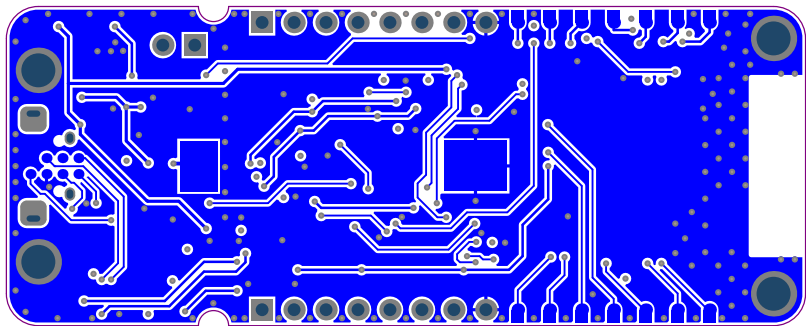
GND











Component list

Bill of Materials Fitted for Variant [Default Assembly] of Project [PIC-BLE.PrjPcb] (No PCB Document Selected)

Source Data From:

PIC-BLE.PrjPcb

Project:

PIC-BLE.PrjPcb

Variant:

Default Assembly

Report Date:

1/14/2020

1:36 PM

Print Date:



Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C101	1	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	C102, C103, C200, C204, C205, C206, C207, C208	8	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C201	1	10nF	Murata	GRM155R71E103KA01D	Ceramic capacitor, SMD 0402, X7R, 25V, 10%
Fitted	C202, C302	2	10uF10V	AVX	0603ZD106MA12A	Ceramic capacitor, SMD 0603, X5R, 10V, 10UF A± 20%
Fitted	C203	1	1uF	AVX	0402ZD105KA12A	Ceramic capacitor, SMD 0402, X5R, 10V, ±10 %
Fitted	C300	1	4.7uF	WALSIN Technology Corporation	0603X475K100CT	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
Fitted	C301	1	560p			Ceramic capacitor, SMD 0402, X7R, 50V, +/-10%
Fitted	D100, D200	2	GREEN LED	ROHM	SML-P12MITT86R	LED, SMD 0402, Green, Wave length=569nm, 2.1mcd @ (1mA, 1.9Vf)rohm
Fitted	D201	1	RED LED	ROHM	SML-P12VTT86R	LED, SMD 0402, Red, Wave length=630nm, 2.1mcd @ (1mA, 1.7Vf)rohm
Fitted	D202	1	BLUE LED	ROHM	SMLP13BC8T1B6	LED, SMD 0402, Blue, Wave length=470nm, 25mcd @ (5mA, 2.9Vf)rohm
Fitted	D300	1	NSR20F30NXT5G	ON Semiconductor	NSR20F30NXT5G	NSR20F30NXT5G Schottky Diode, Icontinuous = 2.0A, Vdrop = 0.48V @ 2A, 0603 package
Fitted	F100	1	MC36213	Multicomp	MC36213	Resetable PTC fuse, Ih = 0.5A, It = 1.0A, 0805 package
Fitted	FW1	1	nEDBG firmw are			nEDBG firmw are
Fitted	J101	1	MJ-MB0142AB2-269	Allen Creations Corp.	MJ-MB0142AB2-269	USB micro AB, Surface mount signals and DIP shield
Fitted	J200, J201	2	2185-108SS0CYNP1	WCON	2185-108SS0CYNP1	1x8 receptacle pin header, 2.54mm pitch THM, PIP
Fitted	J300	1	CH7410-2032LF	Multicomp	CH7410-2032LF	Battery Holder, SMT, 20 mm
Fitted	LABEL.1	1	Label PCBA Small 6x6mm	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	M200	1	RN4870-V/RM140	Microchip	RN4870-V/RM140	Bluetooth LE Module
Fitted	PCB1	1	PIC-BLE PCB documentation			PIC-BLE PCB documentation
Fitted	PCBADOCL	1	A09-3283 PIC-BLE PCBA documentatio			PIC-BLEPCBA documentation
Fitted	Q100, Q101	2	DMN65D8LFB	Diodes Incorporated	DMN65D8LFB-7	N-channel MOSFET, DFN1006-3 (SOT883), 60V, 330mA, 4Ohm
Fitted	Q300	1	MIC94050	Microchip	MIC94050YM4-TR	MIC94050 4-terminal P-channel MOSFET with separate substrate pin
Fitted	R100, R104, R108, R208, R209, R210, R306, R308	8	1k	ASJ Holdings	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R101, R102, R106, R109, R112, R113, R201, R305	8	100k	ASJ Holdings	CR10-1003-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R103, R105, R107, R110, R111, R207	6	330R	Yageo	RC0402FR-07330RL	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R200, R211, R212	3	10k	Yageo	RC0402FR-0710KL	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R202, R203, R204, R205	4	4.7k	Yageo	RC0402FR-074K7L	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R206, R213, R214, R301, R303, R304	6	0R	(n/a)	RMCF0402ZT0R00	RES 0.0 OHM 1/16W 0402 SMD
Fitted	R300	1	2M	Yageo	RC0402FR-072ML	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R302	1	5.6k	Yageo	RC0402FR-075K6L	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R307	1	2.2k	ASJ Holdings	CR10-2201-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	SW200	1	KMR221G	ITT Corporation	KMR221G	Microminiature Tact Switch for SMT
Fitted	TEST1	1	PIC-BLE Test			Fixture test for PIC-BLE
Fitted	TESTDOC1	1	PIC-BLE Test Instructions			PIC-BLE Test Instructions
Fitted	U100	1	SAMD21E18A-MJT	Microchip	ATSAMD21E18A-MJT	32-bit RISC MCU 32pin
Fitted	U200	1	PIC16LF18456T-VSTX	Microchip	PIC16LF18456T-VSTX	PIC16LF18456 microcontroller, 28-pin VQFN
Fitted	U201	1	ATECC608A I2C (Google Cloud)	Microchip	ATECC608A-MAH1H-S	ATECC608A with an I2C Interface and a 8 Pin UDFN
Fitted	U202	1	MCP9844	Microchip	MCP9844T-BE/MNY	±1°C Maximum Accuracy Digital Temperature Sensor, I2C/SMBus, 1.7V - 3.6V, 8TDFN 2x3mm
Fitted	U203	1	BMA253	Bosch Sensortec	BMA253	Digital, triaxial acceleration sensor, LGA12 2x2x1.0mm
Fitted	U204	1	SST25PF040CT-40INP	Microchip	SST25PF040CT-40INP	4mB 512K X 8 SPI Serial Flash 2.3-3.6V USON-8 2X3mm
Fitted	U300, U302	2	MIC94165	Microchip	MIC94165CS-TR	Loadswitch, Rds(on) = 14.5mohm, 1.0mm x 1.5mm WLCSP, reverse blocking, 2.7ms Soft Start
Fitted	U301	1	MIC33050-SYHL	Microchip	MIC33050-SYHL-TR	3.3V Fixed, 4MHz, 600mA, Buck regulator with internal inductor with HyperLight Load
Not Fitted	J301	0	1125-1102S0S113R1	WCON	1125-1102S0S113R1	1x2 pin header, 2.54mm pitch, Pin-in-Paste THM
Not Fitted	U205	0	MCP111T-195	Microchip	MCP111T-195VLB	Micropower Voltage Detector/Supervisor, SC-70, 3-pin, Vtrip=1.90V

Approved

Notes