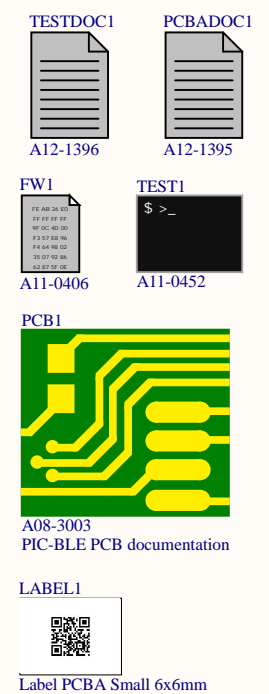
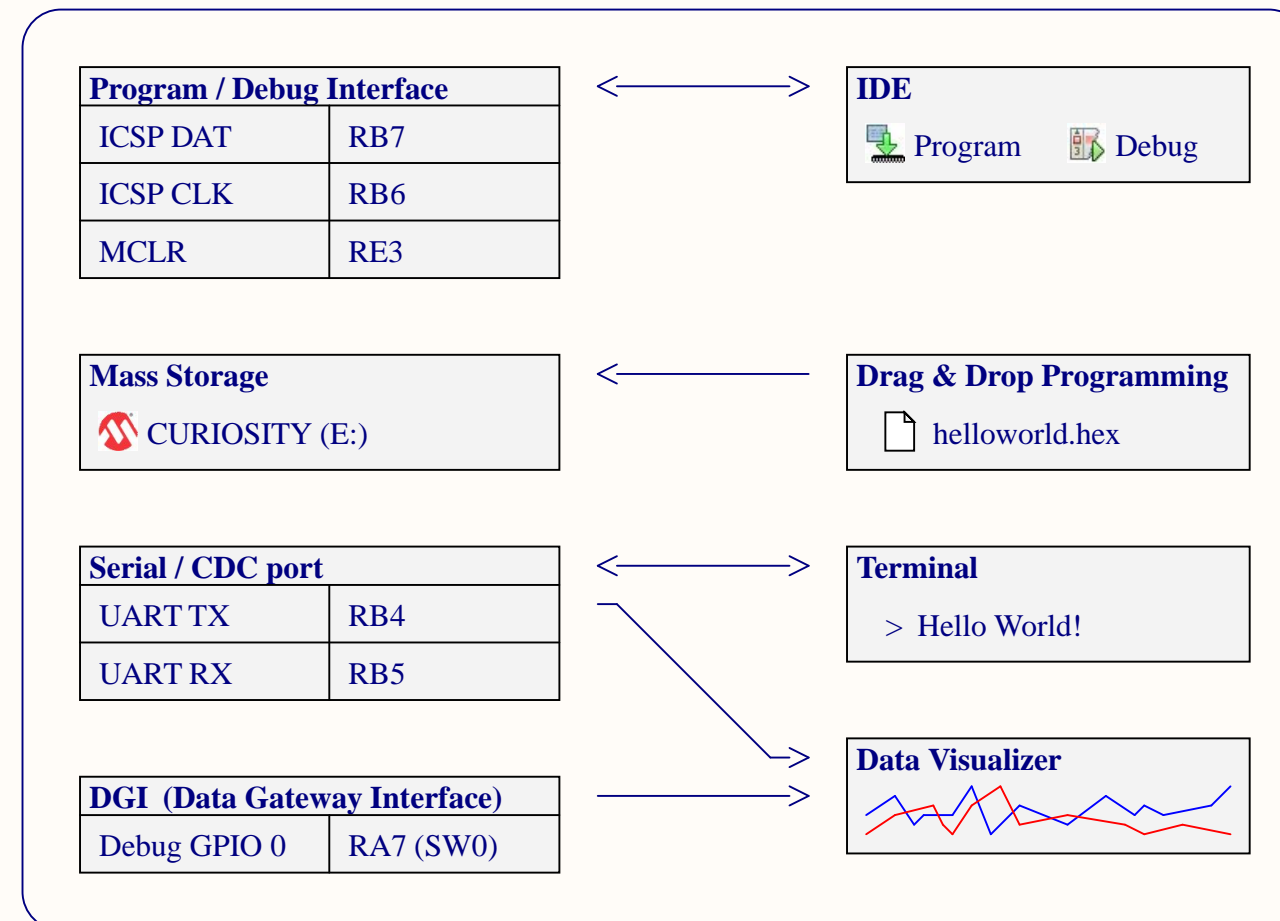
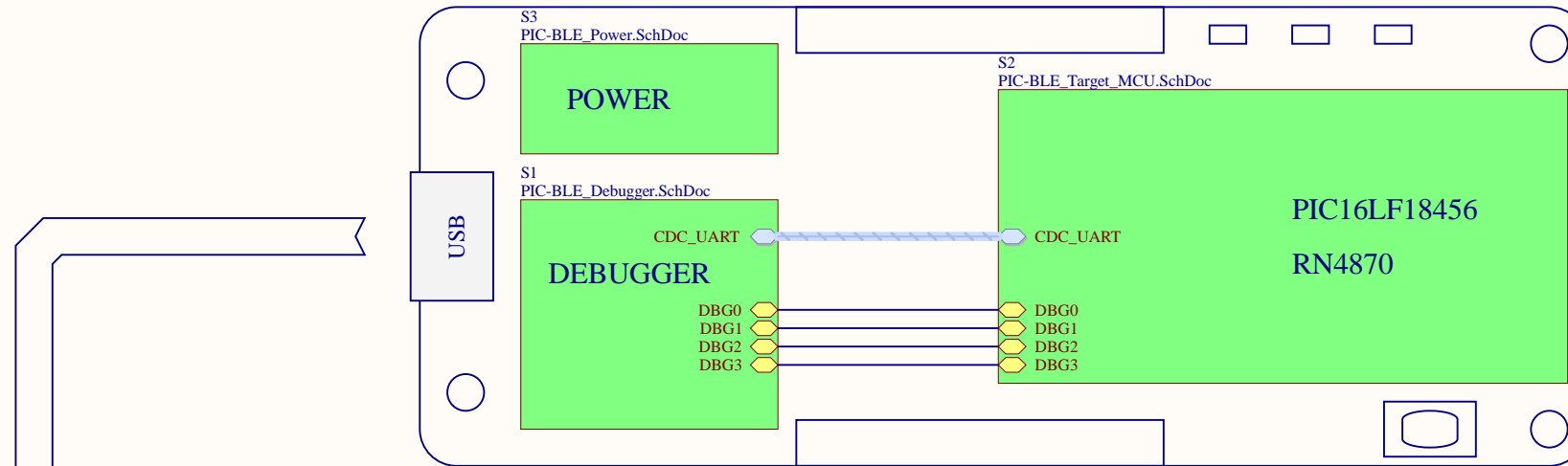
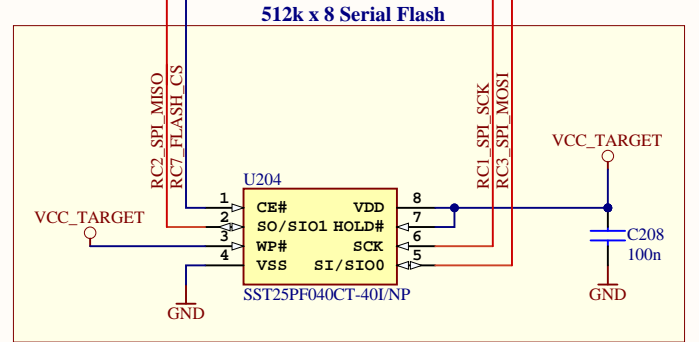
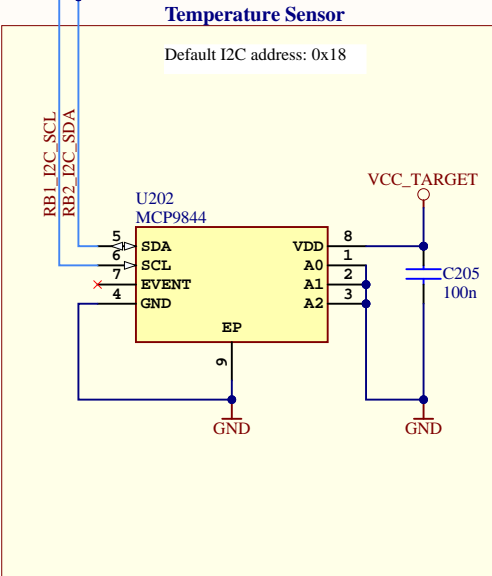
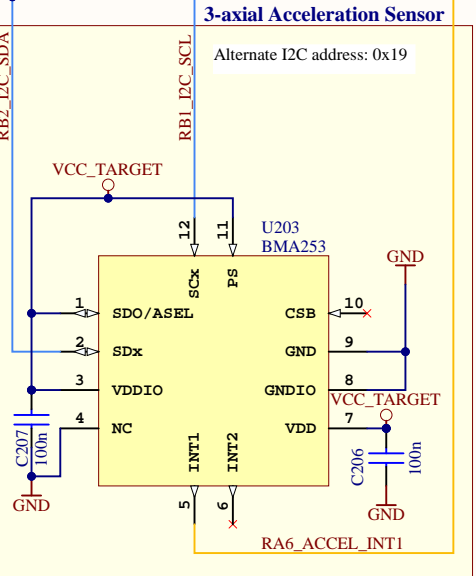
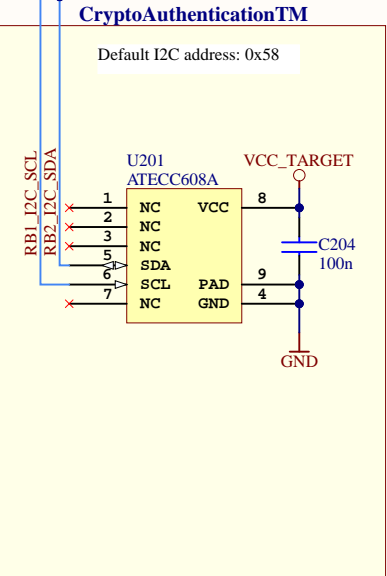
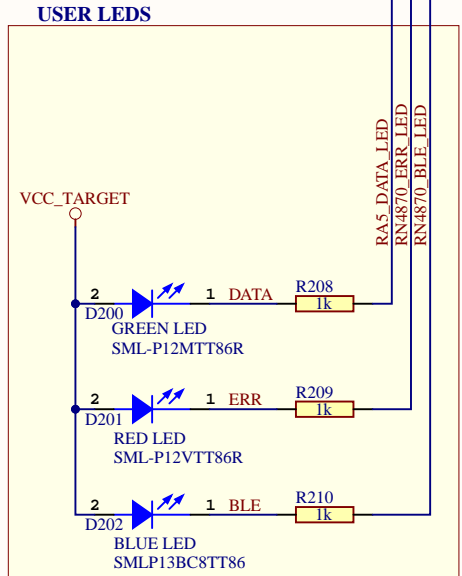
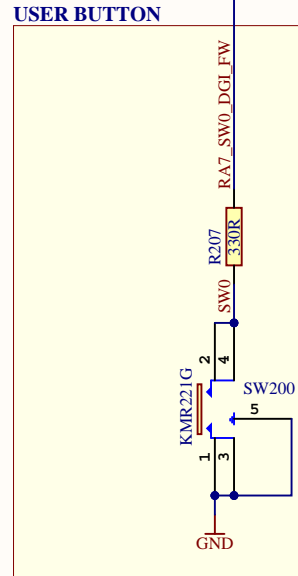
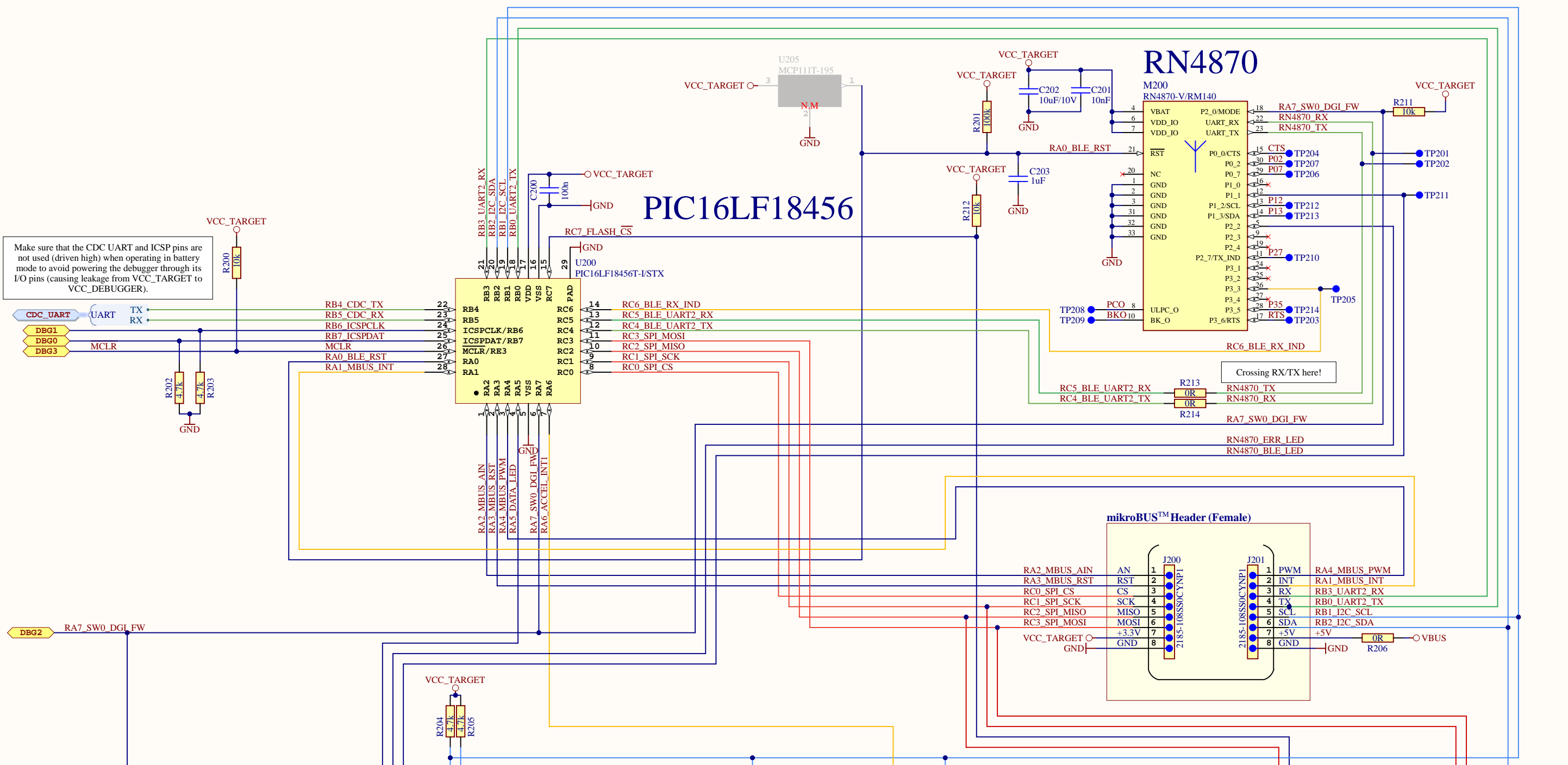


PIC-BLE



Drawn By: Microchip Norway		
Engineer: TF/PB		
Project Title PIC-BLE		
Sheet Title Top Level		
Size A3	PCB Assembly Number: A09-3283	PCBA Revision: 4
	PCB Number: A08-3003	PCB Revision: 3
File: PIC-BLE_TopLevel.SchDoc		Date: 1/14/2020
		Page: 1 of 5

Designed with
Altium
Altium.com



Drawn By: Microchip Norway
 Engineer: TF

Project Title: **PIC-BLE**
 Sheet Title: Target MCU

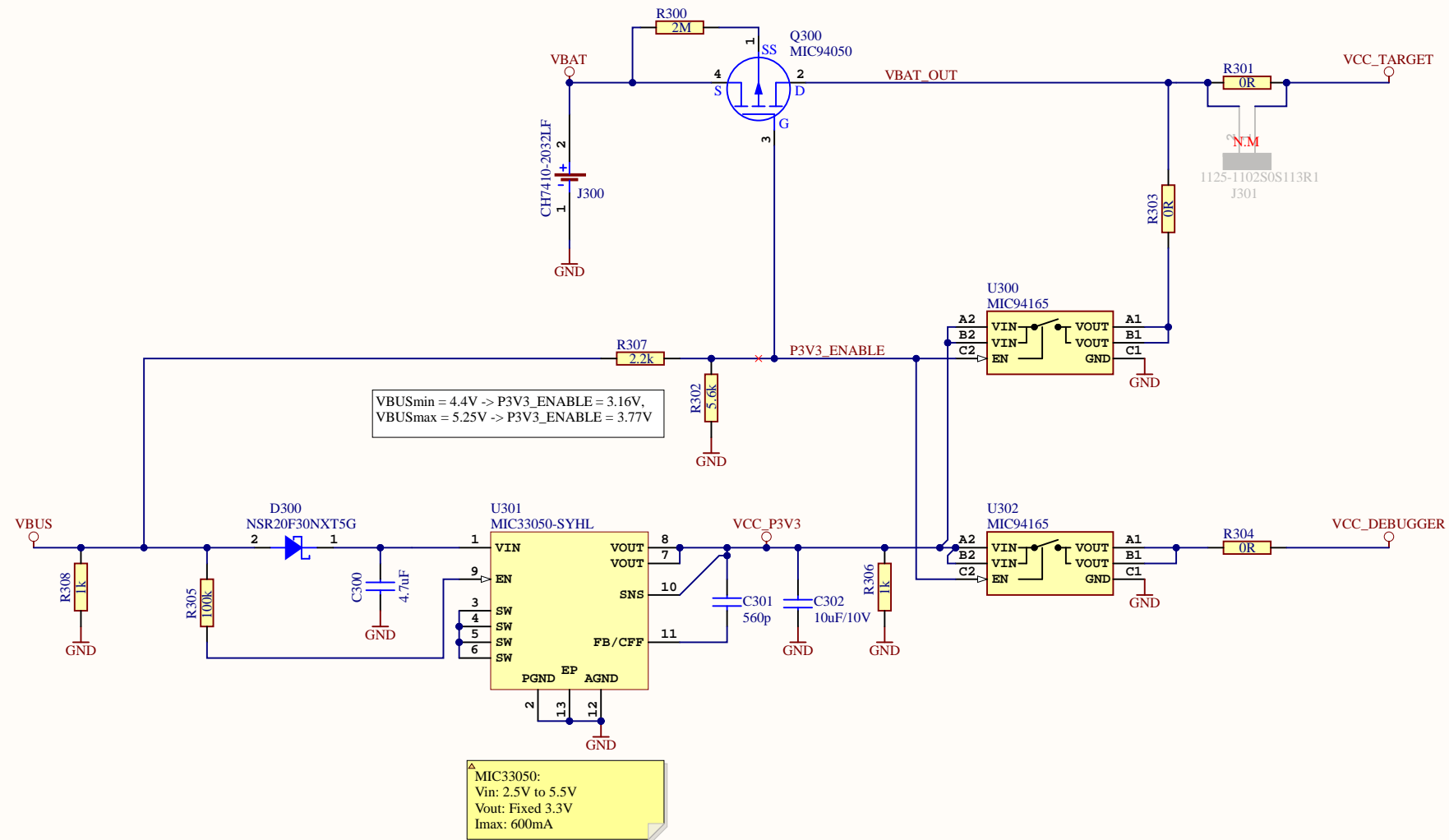
Size: A3
 PCB Assembly Number: A09-3283
 PCB Number: A08-3003


PCBA Revision: 4
 PCB Revision: 3

Date: 1/14/2020
 Page: 2 of 5

Designed with **Altium**
 Altium.com

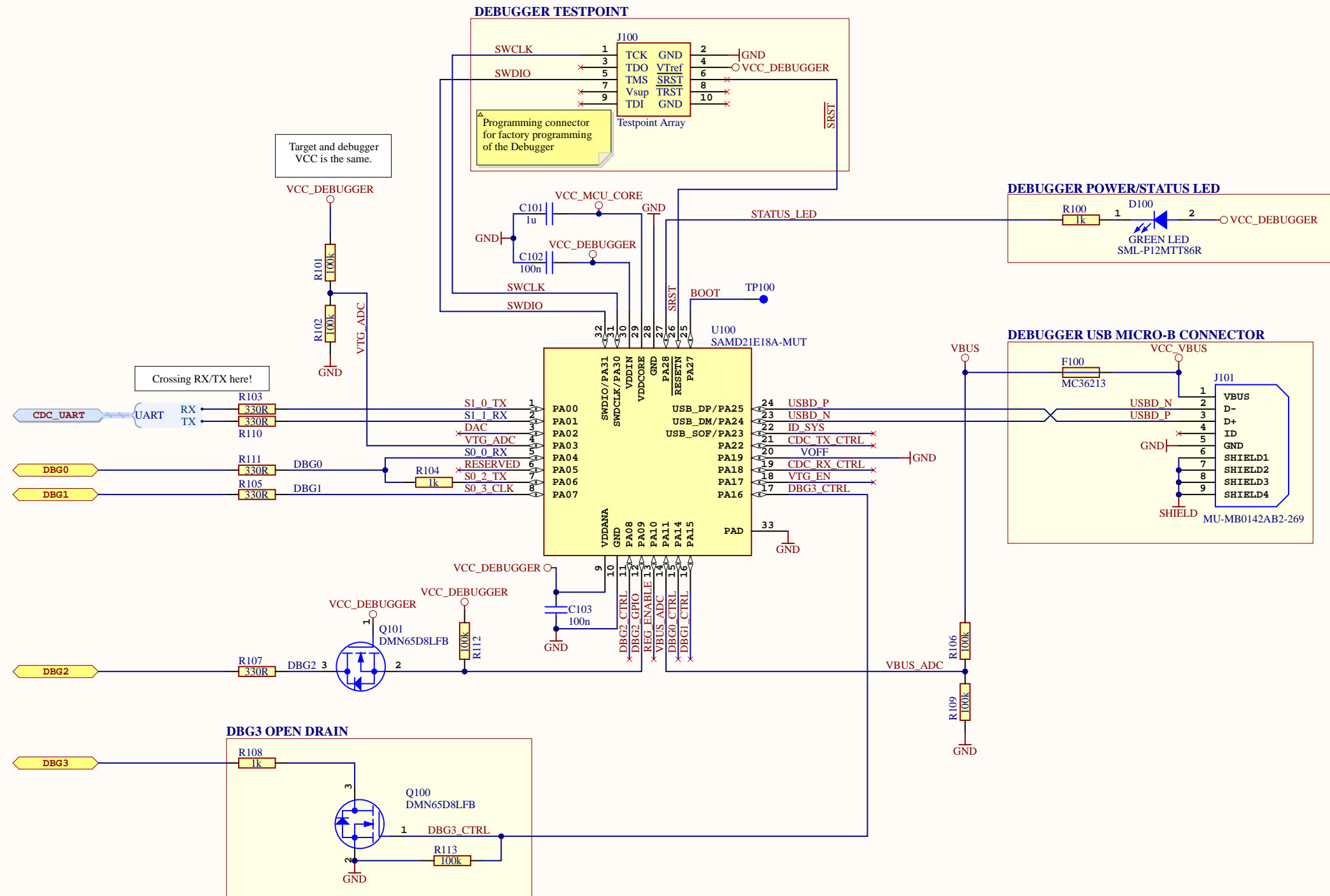
POWER



Drawn By: Microchip Norway		
Engineer: TF		
Project Title PIC-BLE	<i>Designed with</i> Altium Altium.com	
Sheet Title Power		
Size A3	PCB Assembly Number: A09-3283	PCBA Revision: 4
File: PIC-BLE_Power.SchDoc	PCB Number: A08-3003	PCB Revision: 3
	Date: 1/14/2020	Page: 3 of 5

DEBUGGER

Interface	ICSP TARGET
Signal	
CDC TX	UART RX
CDC RX	UART TX
DBG0	DAT
DBG1	CLK
DBG2	GPIO
DBG3	MCLR
VCC	-



Drawn By: Microchip Norway		
Engineer: TF		
Project Title PIC-BLE	Altium Altium.com	
Sheet Title Debugger		
Size A3	PCB Assembly Number: A09-3283	PCBA Revision: 4
	PCB Number: A08-3003	PCB Revision: 3
File: PIC-BLE_Debugger.SchDoc		Date: 1/14/2020
		Page: 4 of 5

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:

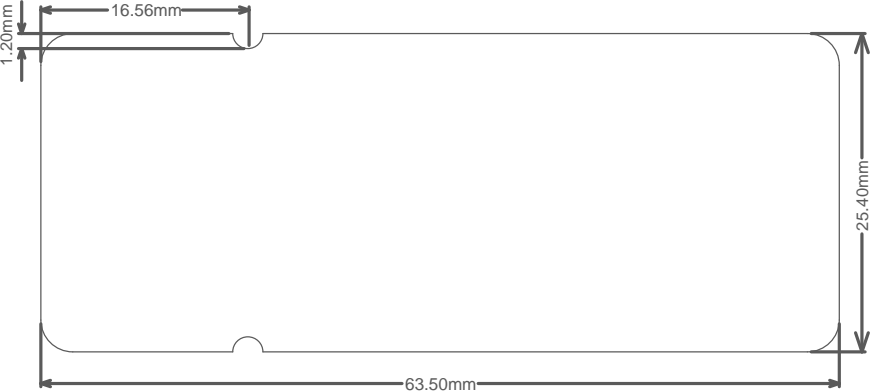
Design Changes:

- Changed RN4870 to rev 1.40

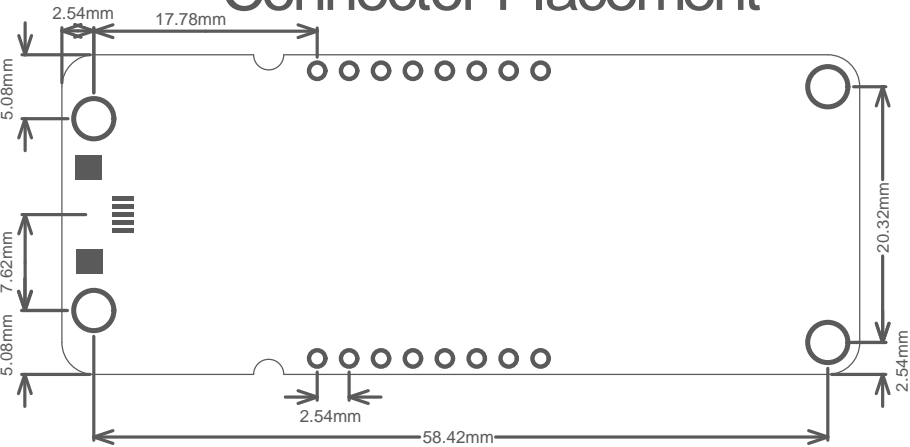
PCB:

PCB revision 2

Drawn By: Microchip Norway			
Engineer: TF			
Project Title PIC-BLE	Designed with  Altium.com		
Sheet Title Revision History			
Size A3	PCB Assembly Number: A09-3283	PCBA Revision: 4	Date: 1/14/2020
	PCB Number: A08-3003	PCB Revision: 3	Page: 5 of 5
File: PIC-BLE_Revision_History.SchDoc			



Connector Placement



GND

J101

GND

D300
R305
C300

U301

R308
R302
R307

F100

U302

R304

Q300

R300

R113

Q100

R108

D100

R100

C101

C102

U100

R200

R106

R109

Q101

R112

C103

R105

R202

R110

R102

R101

R111

R104

R203

R107

ISNS

J301

C301

C302

R306

R301

U300

R303

U205

MCP9844 BMA253 ECC608

U201

U203

U202

C207

C205

C206

J201

PWM

INT

RX

TX

SCL

SDA

5V

GND

RA4

RA1

RB3

RB0

RB1

RB2

R206

R204

R205

U200

C200

U204

C208

R212

PIC16LF18456

mikro

BUS

R201

C203

D200

R208

DATA

D201

R209

ERR

D202

R210

BLE

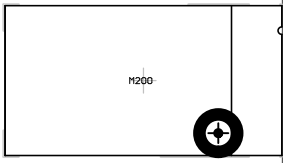
C202

C201

GND

PIC-BLE

SST25P040C



SECURE SMART CONNECTED

RA2

RA3

RC0

RC1

RC2

RC3

AN

RST

CS

SCK

SDO

SDI

3V3

GND

TX R214

RX R213

RN4870 BLUETOOTH LE

R211

R207

SW200

SWO

GND

J200

GND

BOOT
TP100

GND

PCBA
LABEL

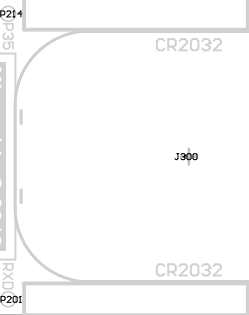


J100

CR2032

J300

CR2032



TP208 TP209 TP210 TP211 TP212 TP213 TP214
P35 P13 P12 P11 P27 BK0 PC0 GND

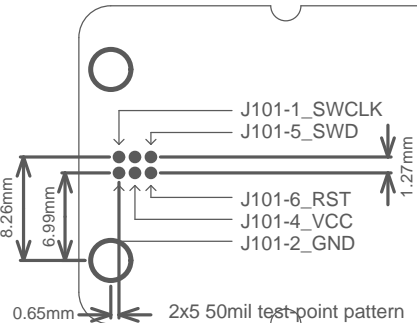
TP207 TP206 TP205 TP204 TP203 TP202 TP201
RXD TXD RTS CTS P33 P07 P02 GND

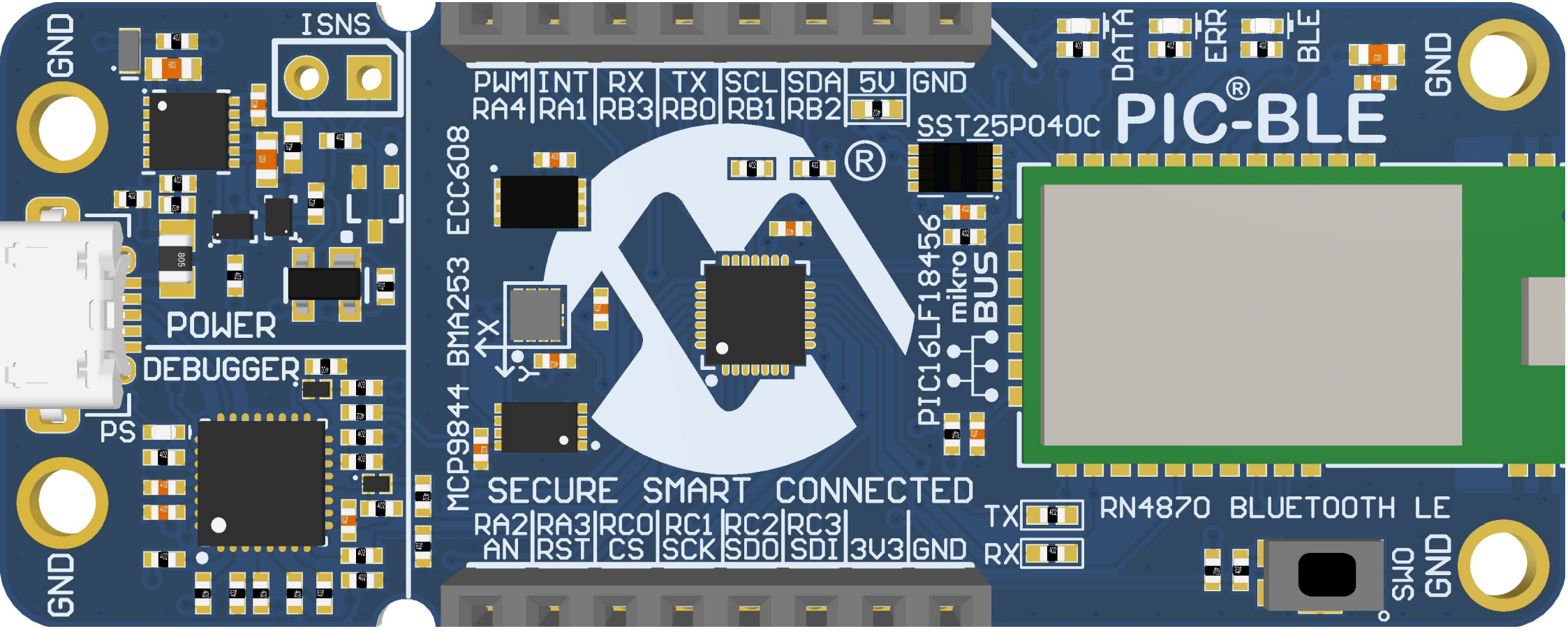
Microchip © 2019
A08-3003 Rev3



®

Test Point Placement





GND

I2S

PWMINT | RX | TX | SCL | SDA | 5V | GND
RA4 | RA1 | RB3 | RB0 | RB1 | RB2

DATA | ERR | BLE

GND

SST25P040C

PIC[®]-BLE

POWER

DEBUGGER

PS

MCP9844 BMA253 ECC608

PIC16LF18456 mikroBUS

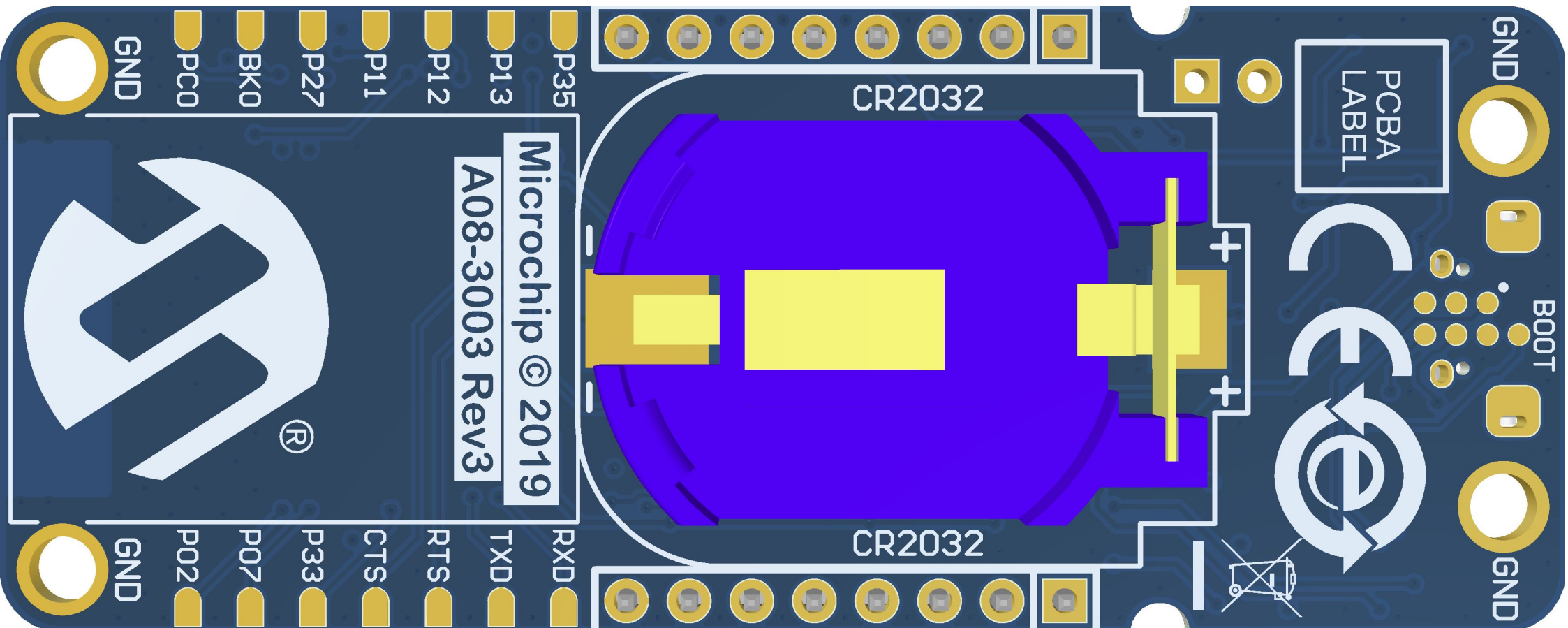
SECURE SMART CONNECTED

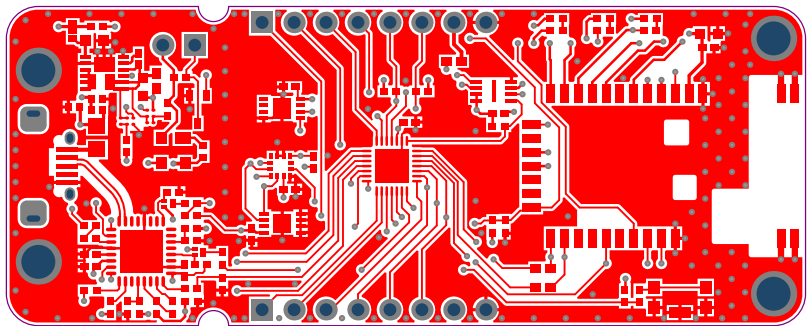
RA2 | RA3 | RC0 | RC1 | RC2 | RC3 |
AN | RST | CS | SCK | SDO | SDI | 3V3 | GND

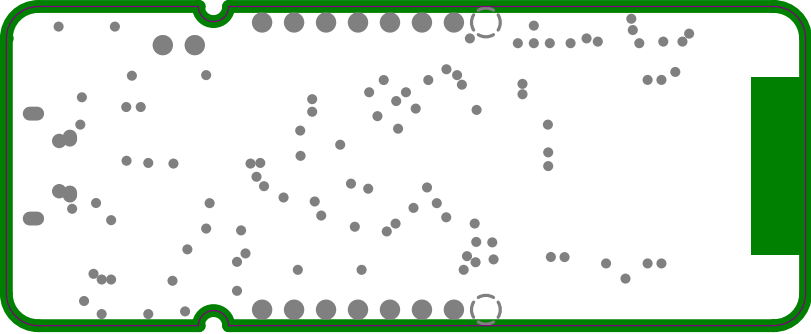
TX | RN4870 BLUETOOTH LE
RX

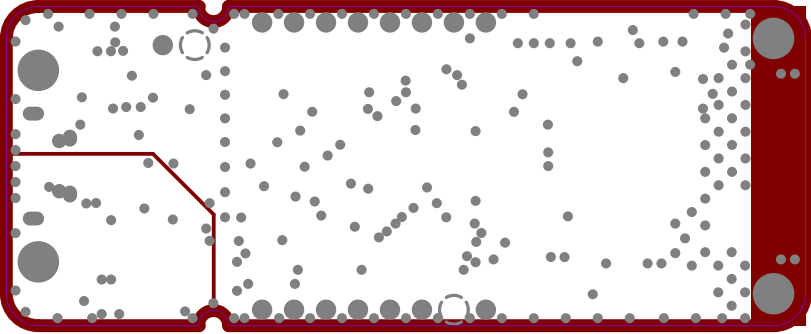
SMD
GND

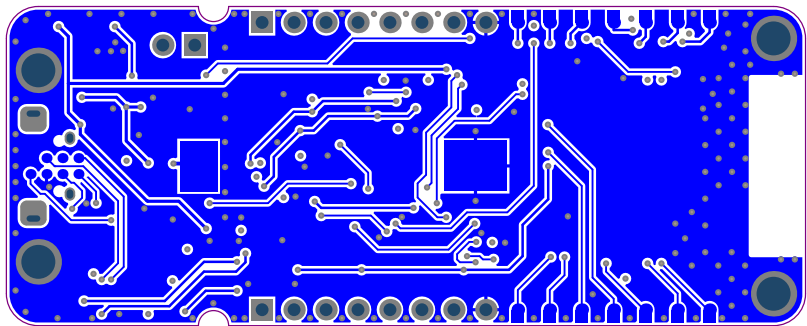
GND











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	0603ZD106MA.T2A	Ceramic capacitor, SMD 0603, X5R, 10V, 10UF A± 20%
Fitted	C203	1	1uF	AVX	0402ZD105KA.T2A	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-P12MTT86R	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	SMLP13BC8T186	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	Mullicomp	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-MB0142A B2-269	Allen Creations Corp.	MJ-MB0142A B2-269	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	Mullicomp	CH7410-2032LF	Battery Holder, SMT, 20 mm
Fitted	LABEL1	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	PCBADOC1	1	A09-3283 PIC-BLE PCBA documentatio			PIC-BLE PCBA documentation
Fitted	Q100, Q101	2	DMN65D8LFB	Diodes Incorporated	DMN65D8LFB-7	N-channel MOSFET, DFN1006-3 (SOT883), 60V, 330mA, 4Ohm
Fitted	Q300	1	MC94050	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-I/STX	Microchip	PIC16LF18456T-I/STX	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-BEMNY	±1A°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, LGA 12 2x2x1.0mm
Fitted	U204	1	SST25PF040CT-40/NP	Microchip	SST25PF040CT-40/NP	4mB 512K X 8 SPI Serial Flash 2.3-3.6V USON-8 2X3mm
Fitted	U300, U302	2	MC94165	Microchip	MIC94165YCS-TR	Loadswitch, Rds(on) = 14.5mohm, 1.0mm x 1.5mm WLCSP, reverse blocking, 2.7ms Soft Start
Fitted	U301	1	MC33050-SYHL	Microchip	MC33050-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

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