



LEGAL NOTICE:
SILICON LABORATORIES INC. ("SILICON LABS") AND/OR ITS LICENSORS DO NOT WARRANT THE ACCURACY OR COMPLETENESS OF THIS SCHEMATIC OR ANY INFORMATION CONTAINED WITHIN THIS SCHEMATIC. IT IS PROVIDED "AS-IS" FOR REFERENCE ONLY. SILICON LABS DOES NOT WARRANT THAT THIS DESIGN WILL MEET THE SPECIFICATIONS, BE SUITABLE FOR YOUR APPLICATION OR FIT FOR ANY PARTICULAR PURPOSE, OR WILL OPERATE IN YOUR IMPLEMENTATION. SILICON LABS AND ITS LICENSORS DO NOT WARRANT THAT THE DESIGN IMPLIED IN THIS SCHEMATIC IS PRODUCTION-WORTHY. YOU SHOULD COMPLETELY VALIDATE AND TEST YOUR DESIGN IMPLEMENTATION TO CONFIRM SYSTEM FUNCTIONALITY FOR YOUR APPLICATION.



Wireless Pro Kit Mainboard	
Board Function	Page
Title Page	1
Radio Board Interface	2
User Interface	3
EXP Header & Breakout Signals	4
Advanced Energy Monitor	5,6
Voltage Regulators	7
Debug Interface	8
Simplicity Interface	9
Logic Analyzer Front End	10
Board Controller I/O	11
Board Controller Power & Misc.	12
Board Controller USB & Ethernet	13

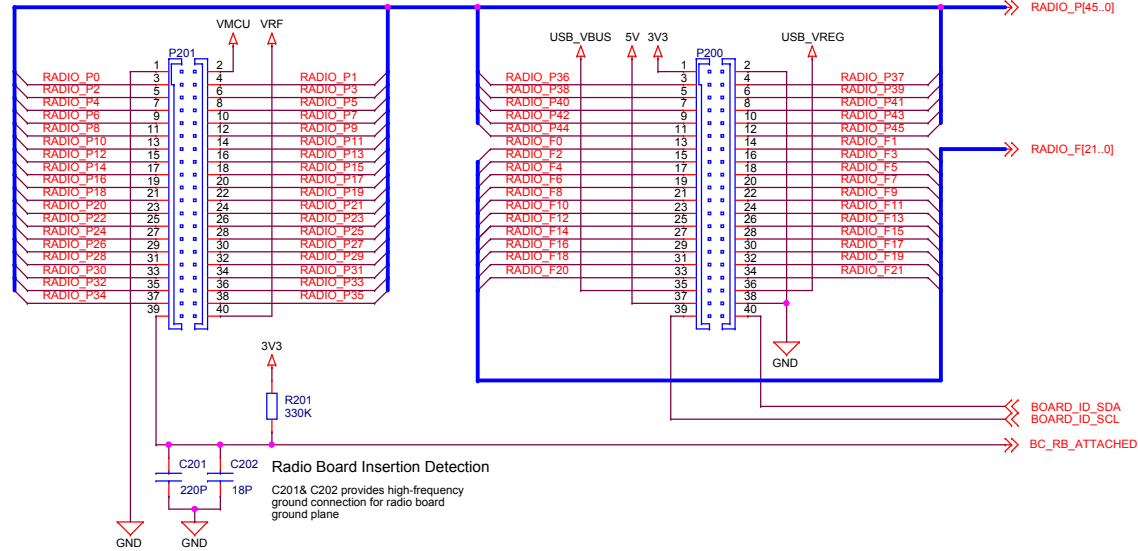
Revision History	
Rev.	Description
A05	Initial release.
A06	Changes to SW102, R746 & R784.

		Board Name	
SILICON LABS		Wireless Pro Kit Mainboard	
Designed HEL		Page Title Title Page	
Approved RGU		Board Number BRD4002A	
Size A3	Sheet Modified Date Monday, January 17, 2022	Revision A06	
COPYRIGHT SILICON LABORATORIES INC. 2022		CONFIDENTIAL – SUBJECT TO TERMS OF USE	
		Sheet 1 of 14	

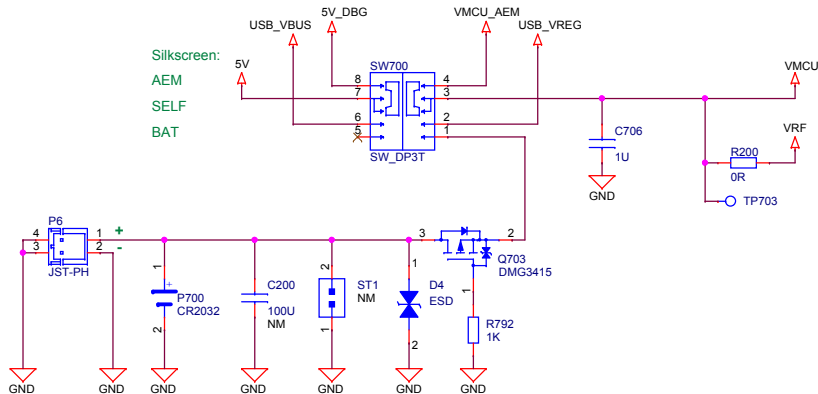
Radio Board Socket

Lower connector

Upper connector

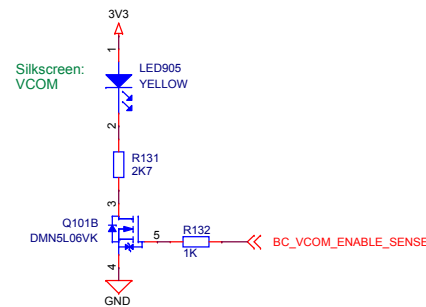


Radio Board Power Selection Switch



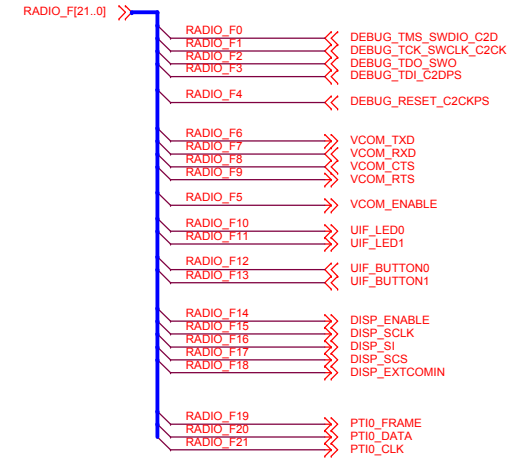
Switch Pos.	VMCU Source	5V Source
AEM	AEM output	5V_DBG from debug USB
SELF	USB_VREG pin on radio board	USB_VBUS pin on radio board
BAT	Coin cell battery, P6 or ST1	Not connected

VCOM Enable Indicator LED

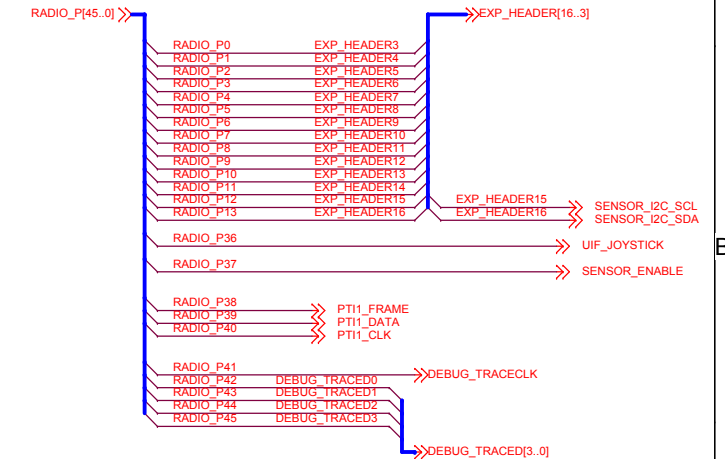


Radio Board Signal Assignments

Dedicated Mainboard Functions

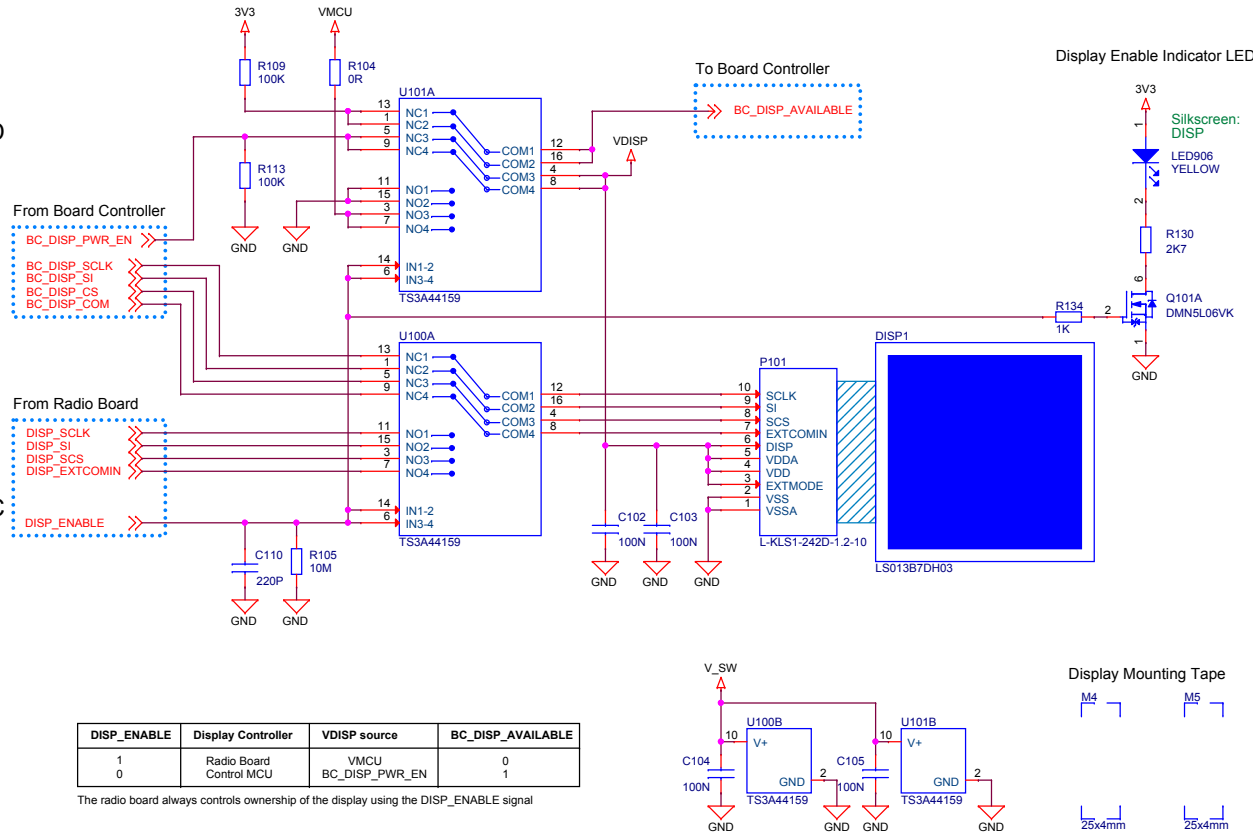


Shared Connections

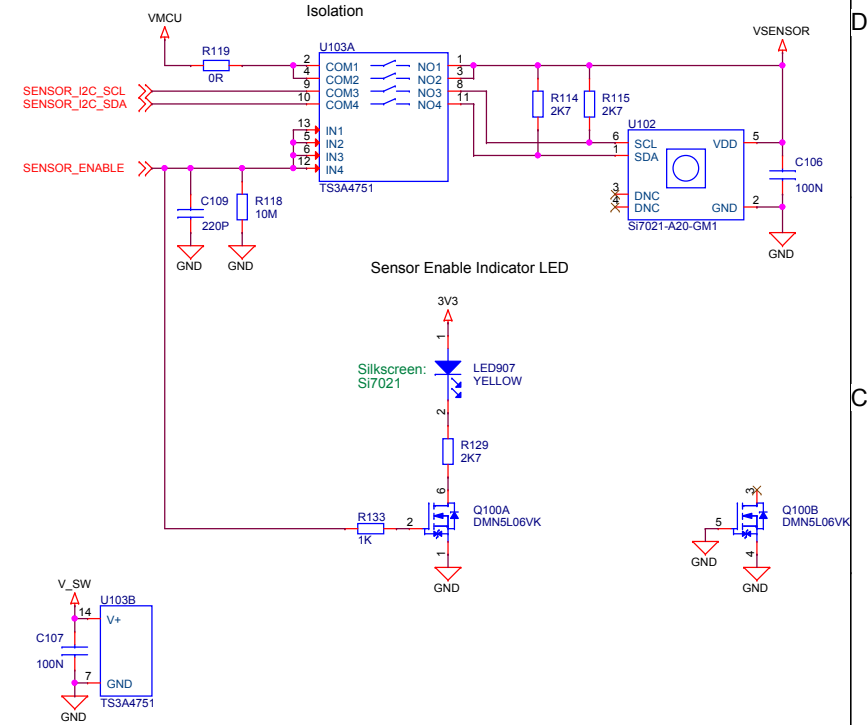


		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
		Radio Board Interface	
Size A3	Sheet Modified Date Monday, January 17, 2022	Board Number BRD4002A	Revision A06
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE			
			Sheet 2 of 14

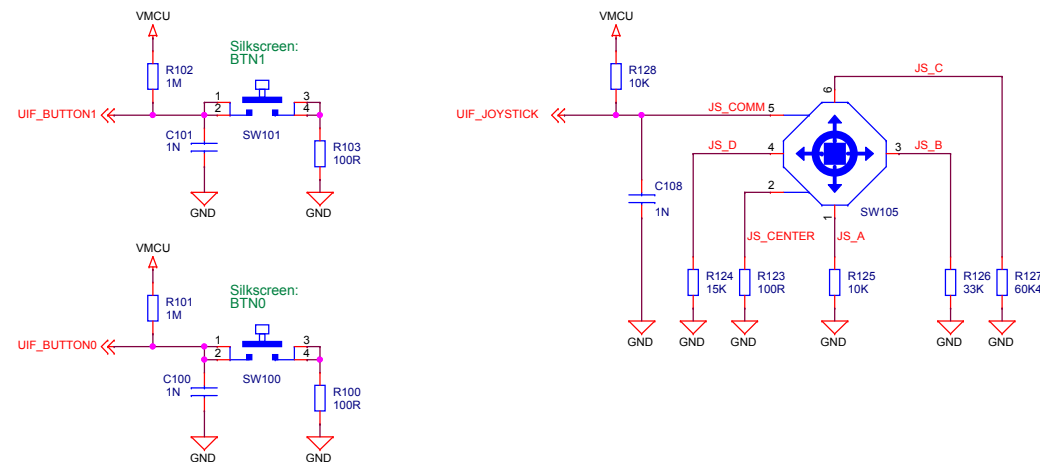
Memory LCD-TFT Display & Multiplexer



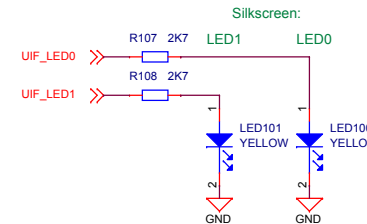
Relative Humidity & Temperature Sensor



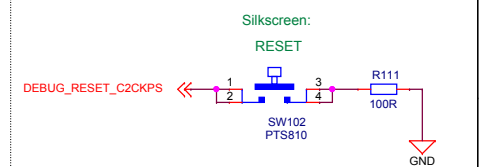
User Buttons & Joystick



User LEDs

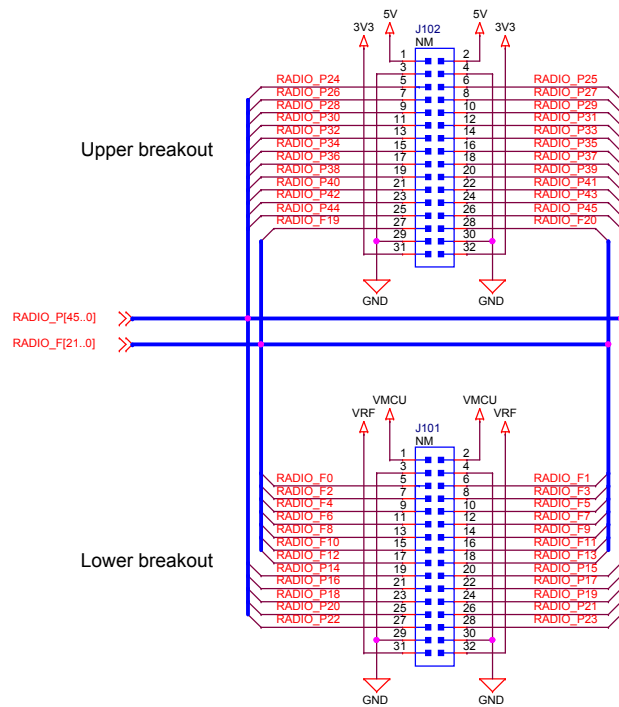


Reset Pushbutton

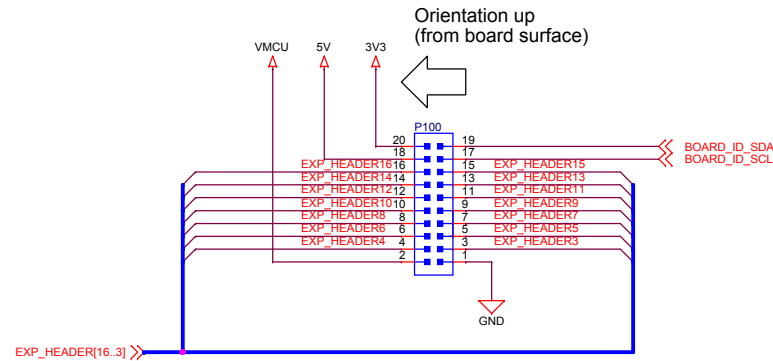


		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
Size A3		User Interface	
Sheet Modified Date Monday, January 17, 2022		Board Number	Revision
		BRD4002A	A06
COPYRIGHT SILICON LABORATORIES INC. 2022			Sheet 3 of 14

Radio Board Breakout Connections




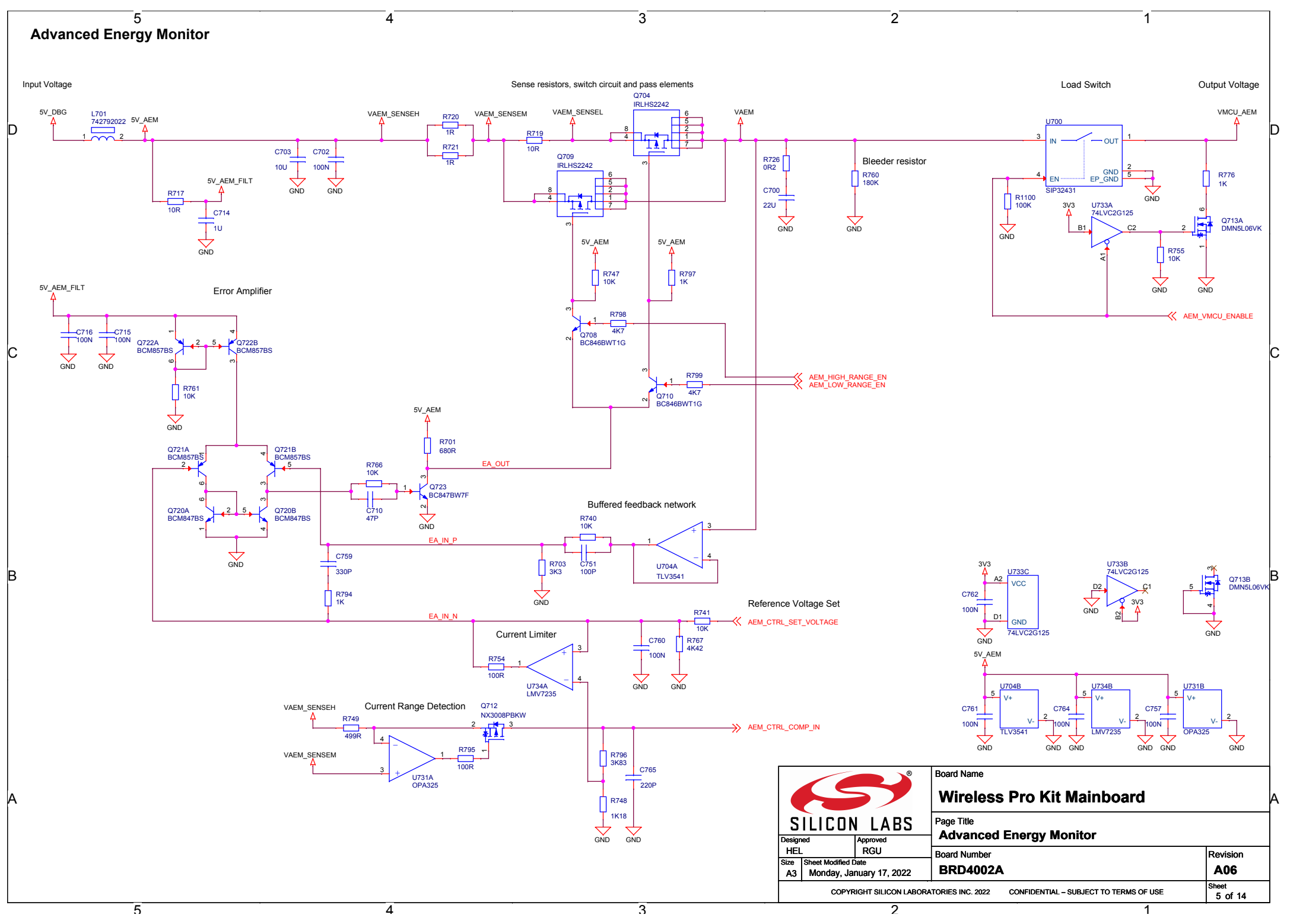
EXP Header



EXP header functionality

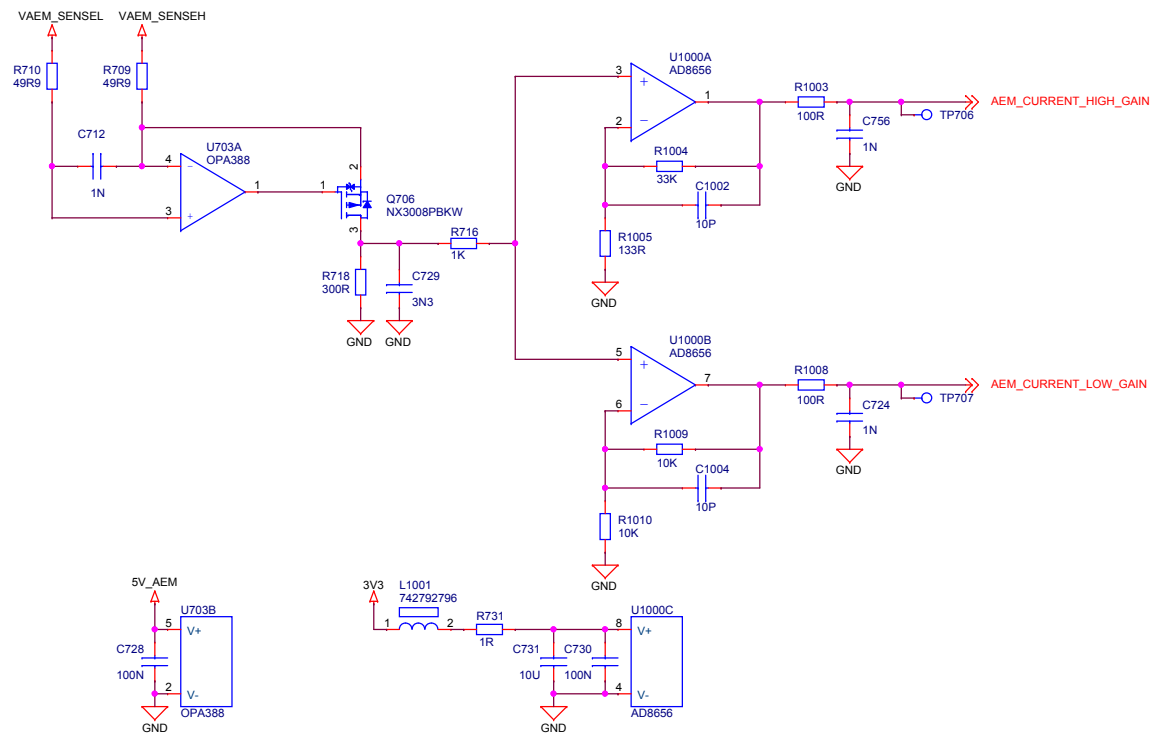
1	GND
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	I2C_SCL
15	Reserved for EXP Board ID
16	Reserved for EXP Board ID
17	Reserved for EXP Board ID
18	
19	
20	

 SILICON LABS		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
Size A3		EXP Header & Breakout Signals	
Sheet Modified Date Monday, January 17, 2022		Board Number	Revision
		BRD4002A	A06
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 4 of 14

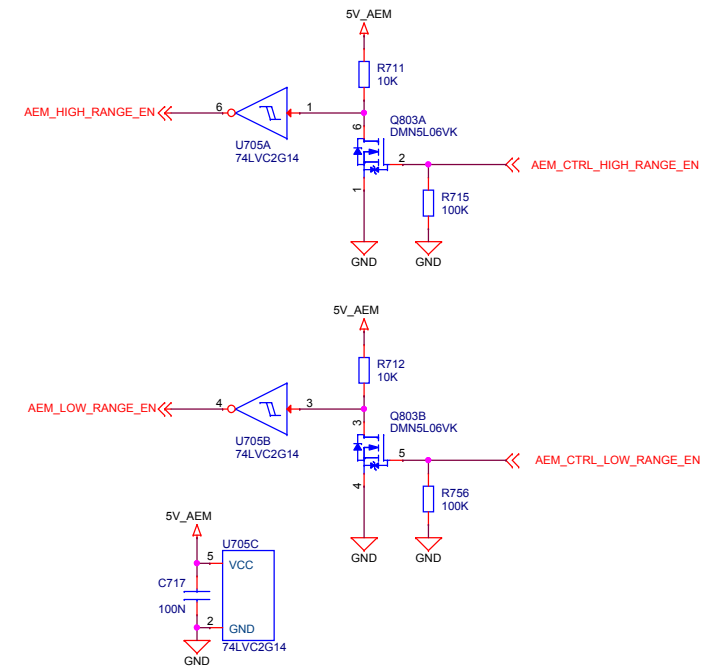
[illegible]

 SILICON LABS		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
Approved RGU		Advanced Energy Monitor	
Size A3	Sheet Modified Date Monday, January 17, 2022	Board Number BRD4002A	Revision A06
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 5 of 14

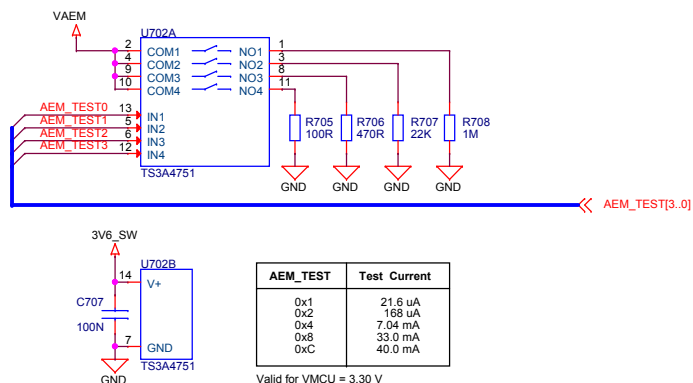
5 AEM Current Sense



AEM Range Control



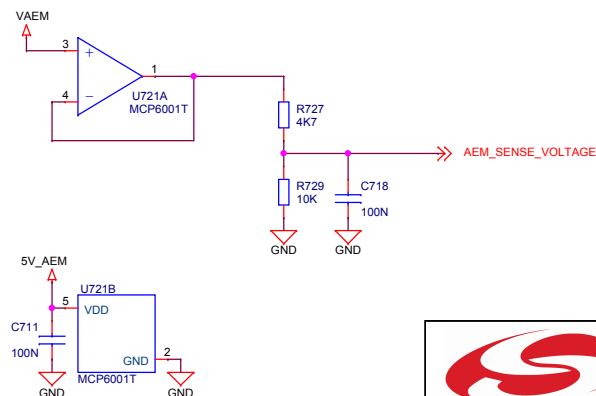
AEM Test Circuit



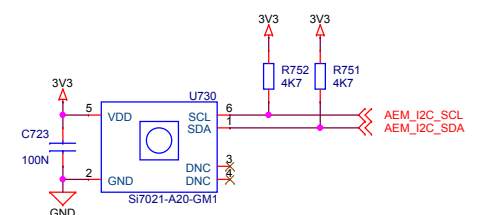
AEM_TEST	Test Current
0x1	21.6 uA
0x2	168 uA
0x4	7.04 mA
0x8	33.0 mA
0xC	40.0 mA

Valid for VMCU = 3.30 V
Current from bleeder resistor
R760 is included.

AEM Voltage Sense



AEM Temperature Sensor



Designed	HEL
----------	-----

Size	SI
A3	

Approved	
RGU	

Sheet Modified Date	Monday, January 1, 2000
---------------------	-------------------------

COPYRIGHT SILICON LABORATORIES INC. 2022

CONFIDENTIAL – SUBJECT TO TERMS OF USE

Board Name

Wireless Pro Kit Mainboard

Page Title

AEM Range Selection

Board Number

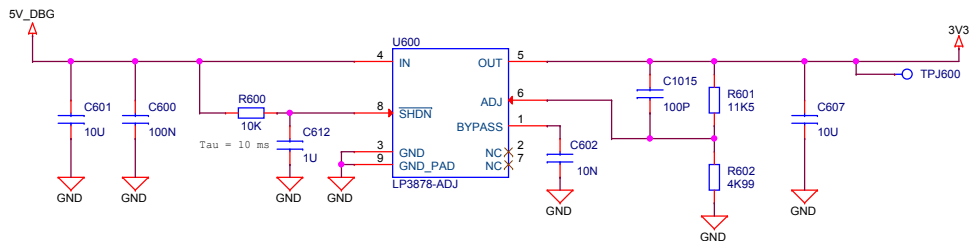
BRD4002A

Revision

A06

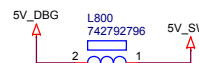
Sheet
6 of 14

3V3 Regulator

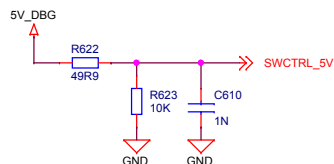


5V Misc.

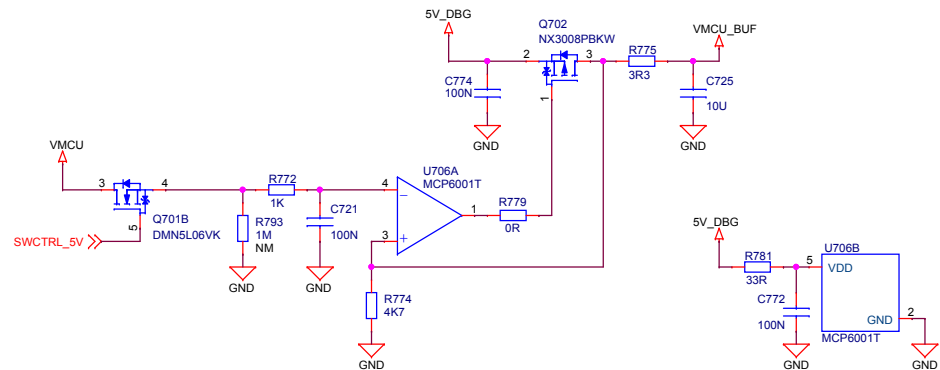
Supply for Isolation Switches



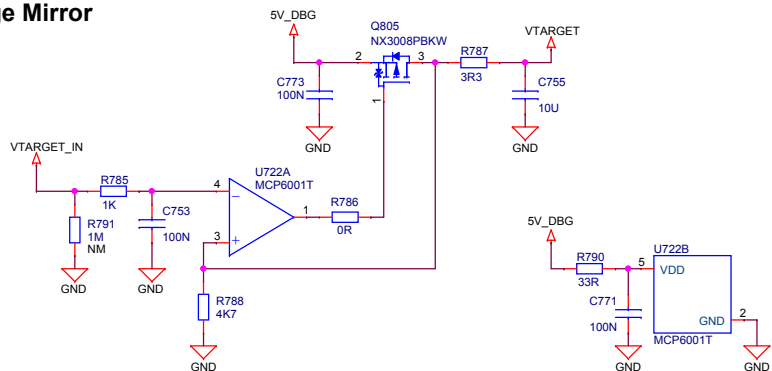
Control Signal for Isolation Switches



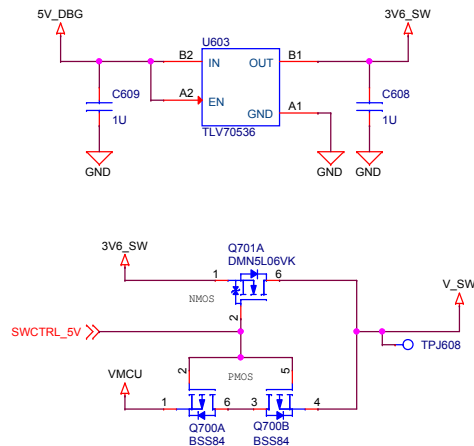
VMCU Voltage Mirror



VTARGET Voltage Mirror



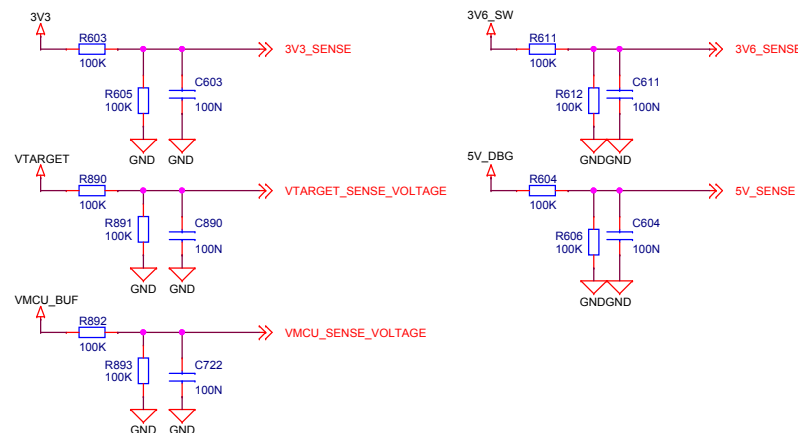
Power Supply for Isolation Switches



J-Link USB Cable	Q700 State	Q701A State	V_SW	VMCU_SENSE
Connected	OFF	ON	3.6V	VMCU
Disconnected	ON	OFF	VMCU	Isolated

Isolation switches are powered by 3V6_SW when the USB cable is connected, otherwise by VMCU.

Voltage Sensing



Board Name

Wireless Pro Kit Mainboard

Page Title

Voltage Regulators

Board Number

BRD4002A

Revision

A06

COPYRIGHT SILICON LABORATORIES INC. 2022

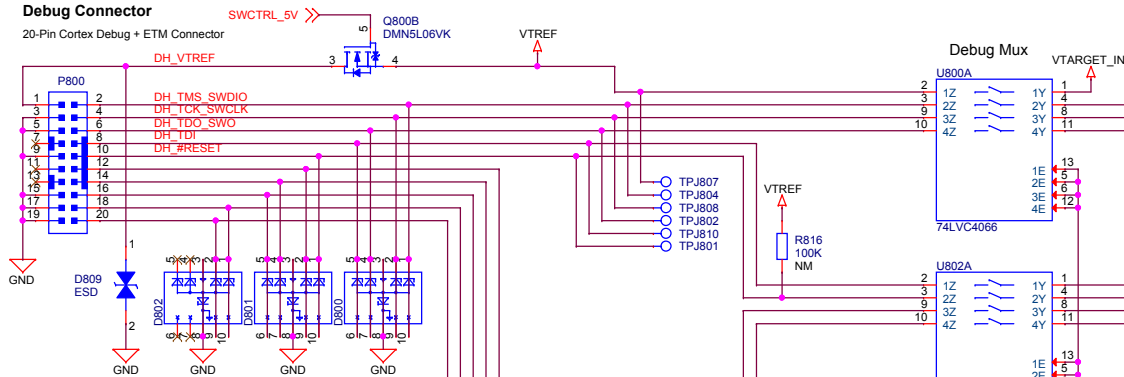
CONFIDENTIAL – SUBJECT TO TERMS OF USE

Sheet
7 of 14

Debug Interface

Debug Connector

20-Pin Cortex Debug + ETM Connector



Debug Signals



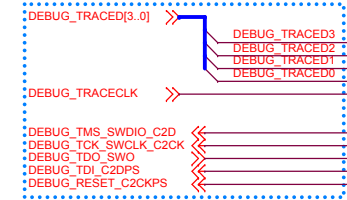
Debug Mux Control Signals (p. 10)



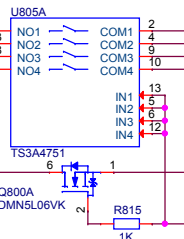
Debug Mode	DH_ENABLE	MCU_SW_ENABLE	MINI_SW_ENABLE
MCU	0	1	0
Debug Out	1	0	0
Mini Out	0	0	1
Debug In	1	1	0
Debug Off	0	0	0

Debug Mode	VTARGET Source	VTREF Source
MCU	VMCU	None
Debug Out	VTREF (EXT)	External
Mini Out	VMCU	None
Debug In	VMCU	VMCU_BUF
Debug Off	VMCU	None

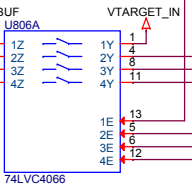
To Radio Board Socket (p.2)



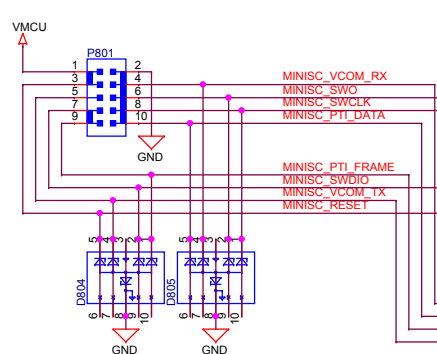
Isolation



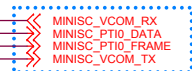
Debug Mux



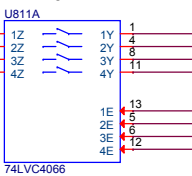
Mini Simplicity Connector



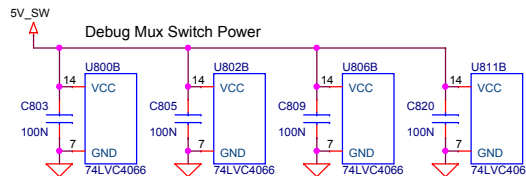
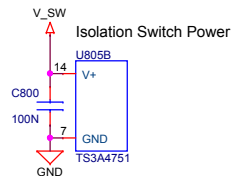
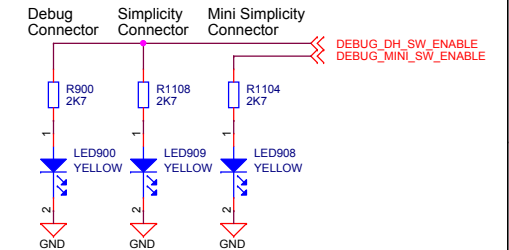
Mini Simplicity PTI & VCOM (p.9)



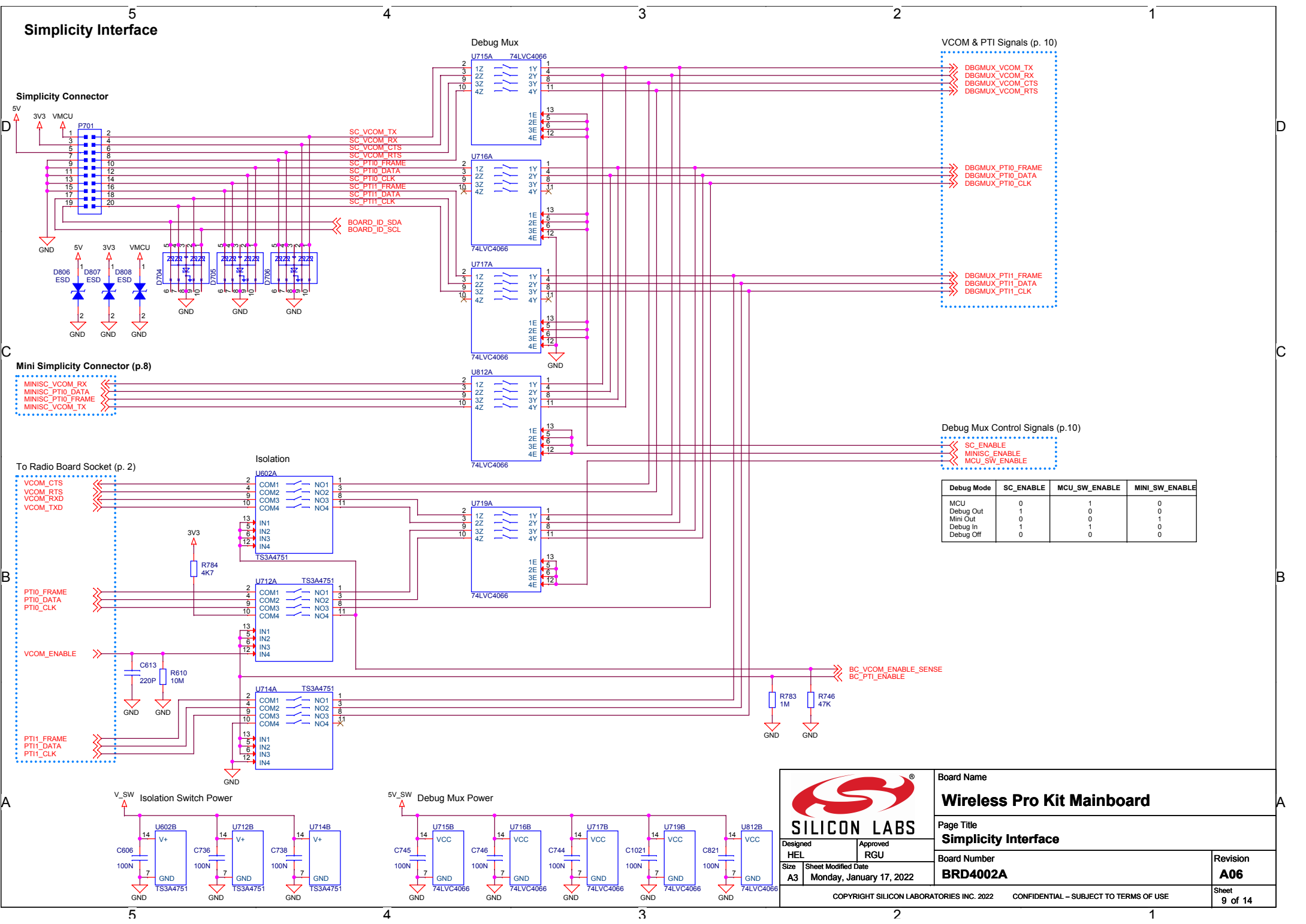
Debug Mux




Indicator LEDs



		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
		Debug Interface	
Size A3		Board Number	
		BRD4002A	
Sheet Modified Date Monday, January 17, 2022		Revision	
		A06	
COPYRIGHT SILICON LABORATORIES INC. 2022		CONFIDENTIAL – SUBJECT TO TERMS OF USE	
		Sheet 8 of 14	



Debug Mode	SC_ENABLE	MCU_SW_ENABLE	MINI_SW_ENABLE
MCU	0	1	0
Debug Out	1	0	0
Mini Out	0	0	1
Debug In	1	1	0
Debug Off	0	0	0



SILICON LABS

Board Name

Wireless Pro Kit Mainboard

Page Title

Simplicity Interface

Board Number

BRD4002A

Revision

A06

Designed
HEL

Approved
RGU

Size
A3

Sheet Modified Date
Monday, January 17, 2022

COPYRIGHT SILICON LABORATORIES INC. 2022

CONFIDENTIAL – SUBJECT TO TERMS OF USE

Sheet
9 of 14

B Debug Mux Control Signal Level Shifting

Level Shifting

U801A 74LVC2T45 (1A, 2A, 1B, 2B, DIR, 5, 7, 6)

U803A 74LVC2T45 (1A, 2A, 1B, 2B, DIR, 5, 7, 6)

Debug Mux Control Signals (from Board Controller)

DEBUC_MINI_SW_ENABLE
DEBUC_DH_SW_ENABLE
BC_VTARGET_VMCU_CON
DEBUC_MCU_ISOLATE_EN

Level Shifter Power

U801B 74LVC2T45 (VCCA, VCCB, GND, 1, 4, 8)

U803B 74LVC2T45 (VCCA, VCCB, GND, 1, 4, 8)

5V_SW, 3V3, C811, C807, C743, C807

Simplicity Interface Level Shifting

2
1

Level Shifting

Debug Mode:

Debug Mode	BC_VCOM_TX_DIR	BC_VCOM_RX_DIR
MCU	1	0
Debug Out	1	0
Mini Out	1	0
Debug In	0	0
Debug Off	0	0

Debug Mode	BC_VCOM_RTS_DIR	BC_VCOM_CTS_DIR
MCU	1	0
Debug Out	1	0
Mini Out	1	0
Debug In	0	0
Debug Off	0	0

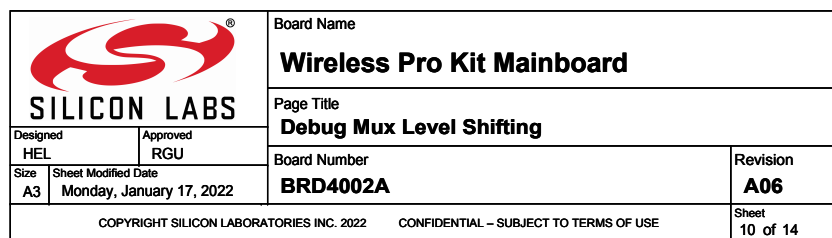
Note: Signal name/direction seen from board controller

Level Shifter Power

VMCU_BUF

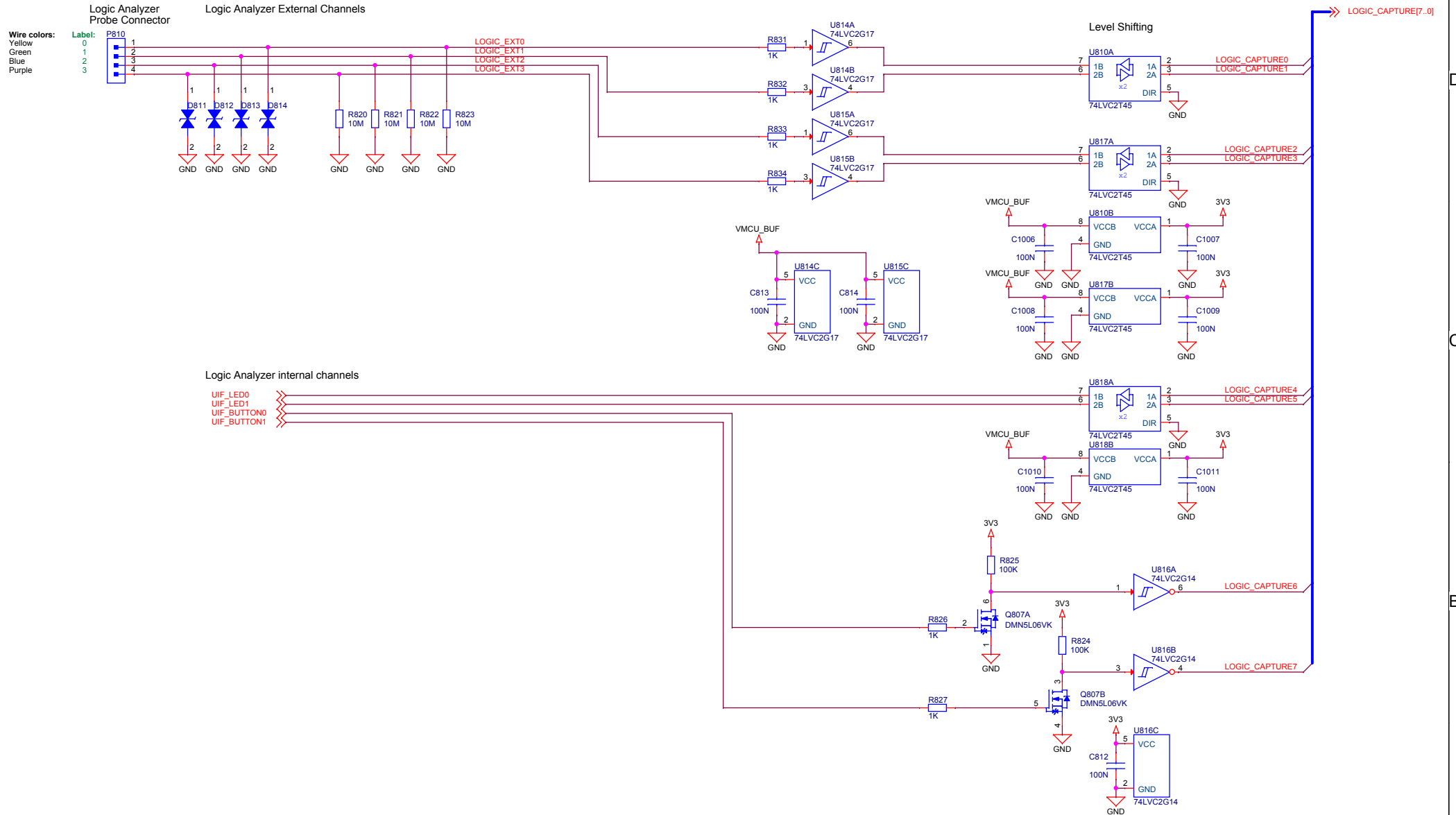
74LVC1T45


74LVC8T245



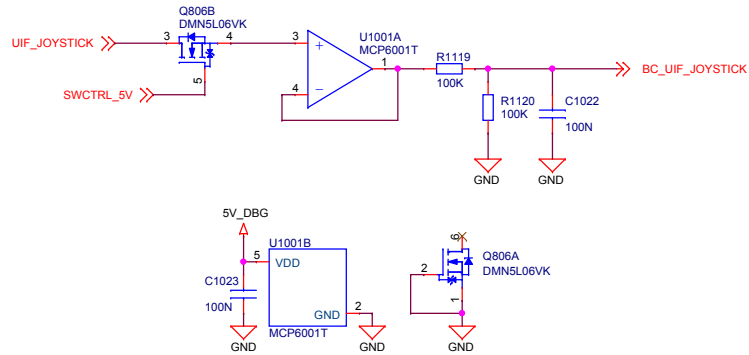
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE

Logic Analyzer Front End



 SILICON LABS		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
Approved RGU		Logic Analyzer Front End	
Size A3	Sheet Modified Date Monday, January 17, 2022	Board Number BRD4002A	Revision A06
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 11 of 14

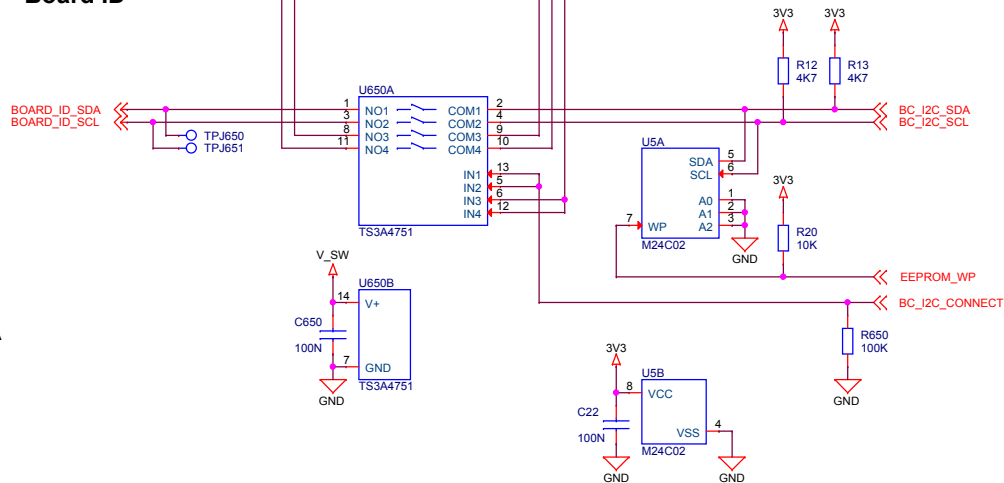
Board Controller Joystick Connection



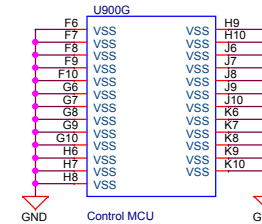
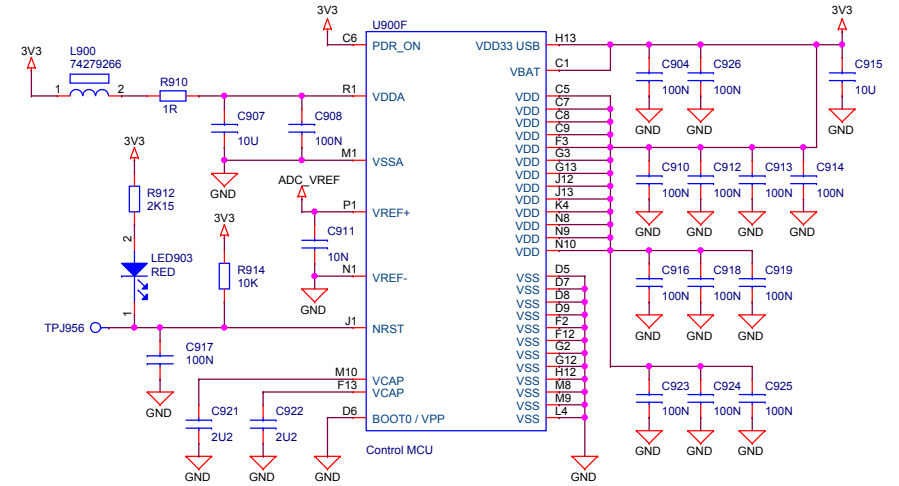
Board Controller Button Connection



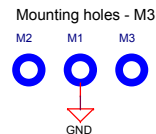
Board ID



Board Controller Power & Decoupling

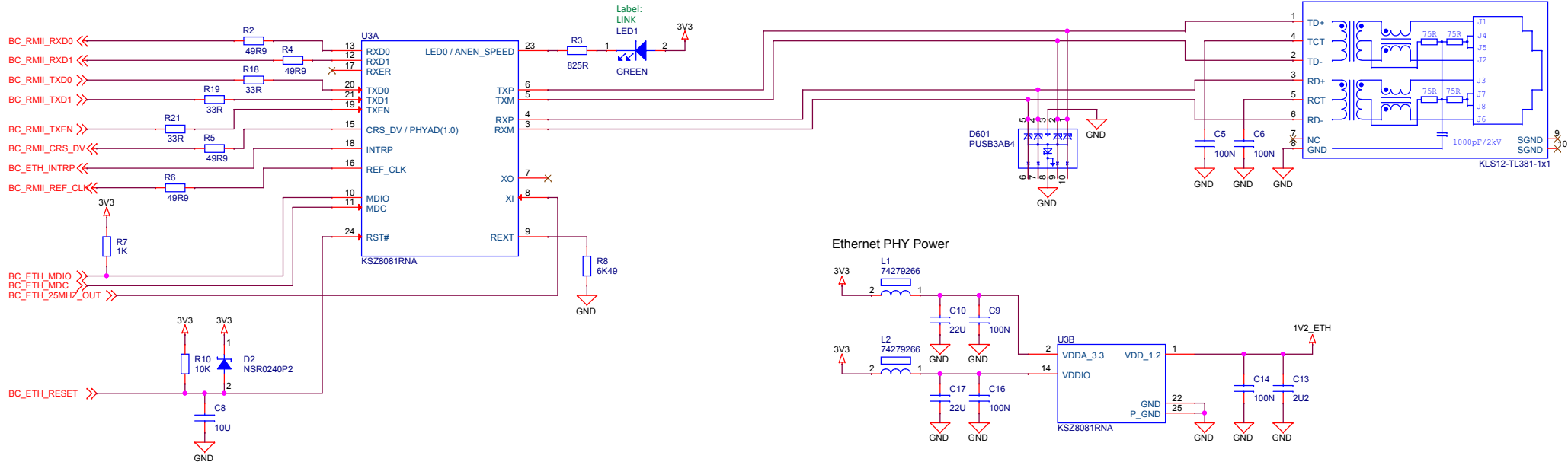


Mounting Holes

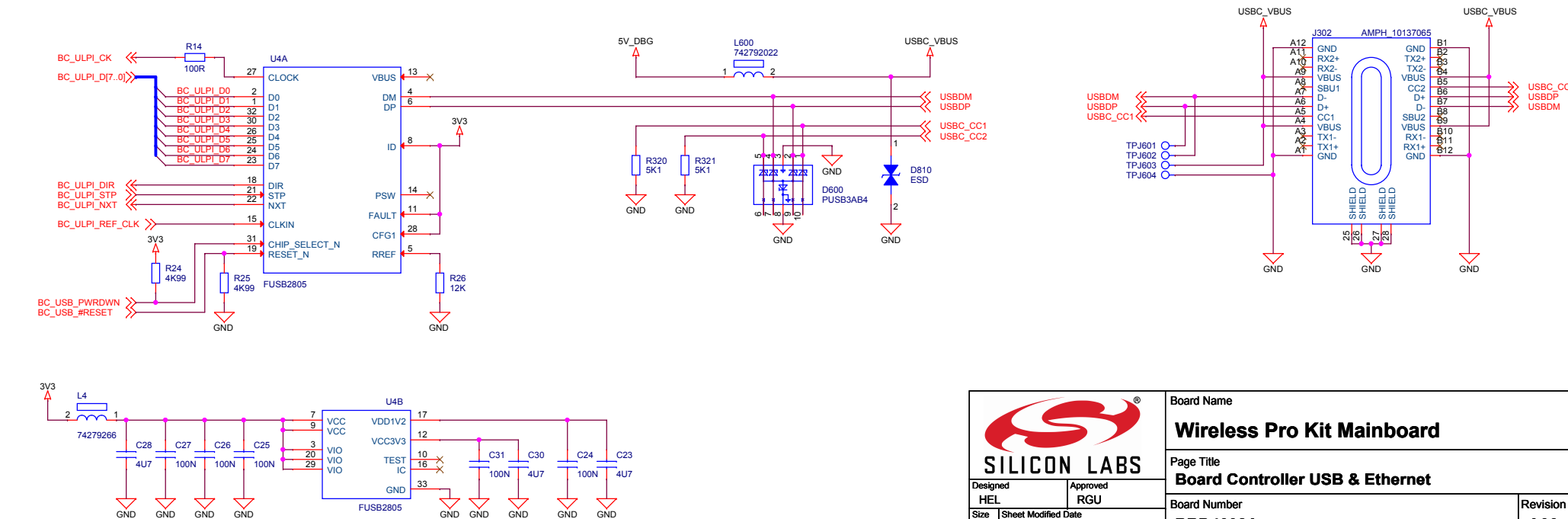


		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
		Board Controller Power & Misc	
Size A3		Board Number	
		BRD4002A	
Sheet Modified Date Monday, January 17, 2022		Revision	
		A06	
COPYRIGHT SILICON LABORATORIES INC. 2022		CONFIDENTIAL – SUBJECT TO TERMS OF USE	
		Sheet 13 of 14	

10/100 Mbit Ethernet PHY



USB High Speed



 SILICON LABS		Board Name	
		Wireless Pro Kit Mainboard	
Designed HEL		Page Title	
		Board Controller USB & Ethernet	
Size A3		Board Number	
		BRD4002A	
Sheet Modified Date Monday, January 17, 2022		Revision A06	
COPYRIGHT SILICON LABORATORIES INC. 2022 CONFIDENTIAL – SUBJECT TO TERMS OF USE			
		Sheet 14 of 14	