Wireless Pro Kit Mainboard

Revision History

Rev.	Description
A05	Initial release.
A06	Changes to SW102, R746 & R784.
A07	Changed P/N to NX3008NBKV, 74LVC2G14GS, 74LVC2G17GS and DMP58D1LV.

PCB1

PCB4002A

SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

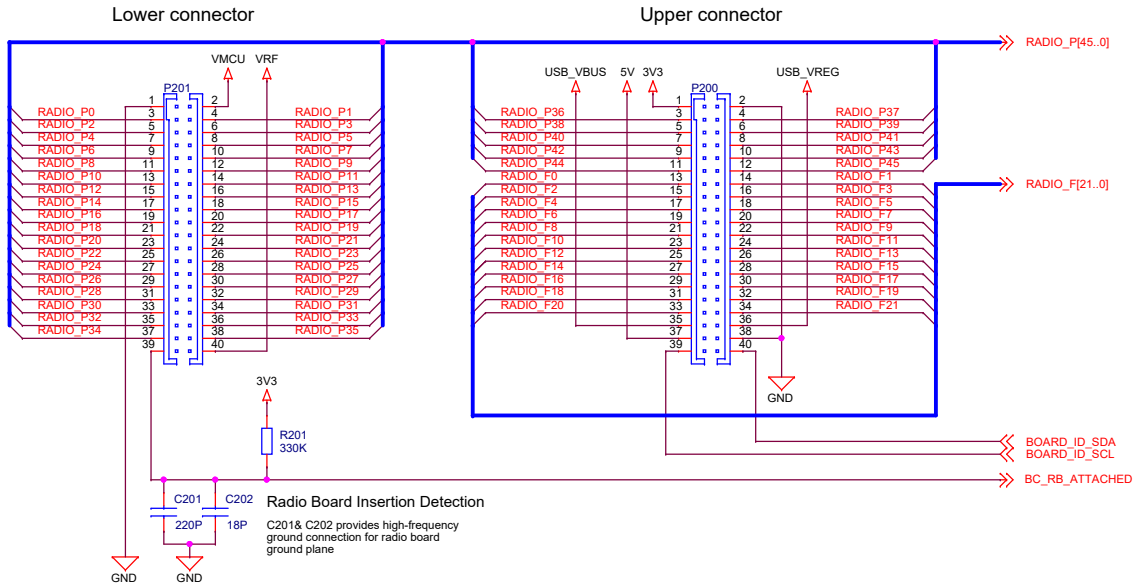
Board Name: **Wireless Pro Kit Mainboard**

Page Title: **Title Page**

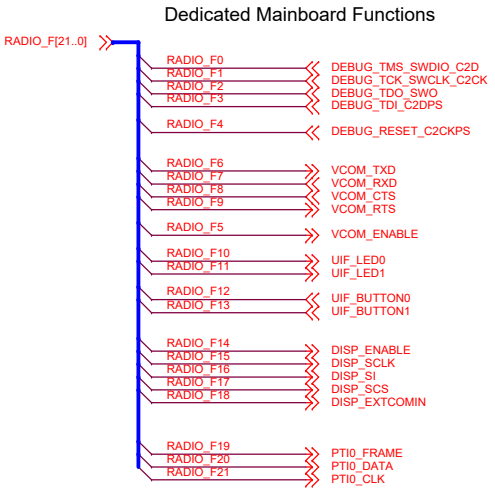
Board Number: **BRD4002A**

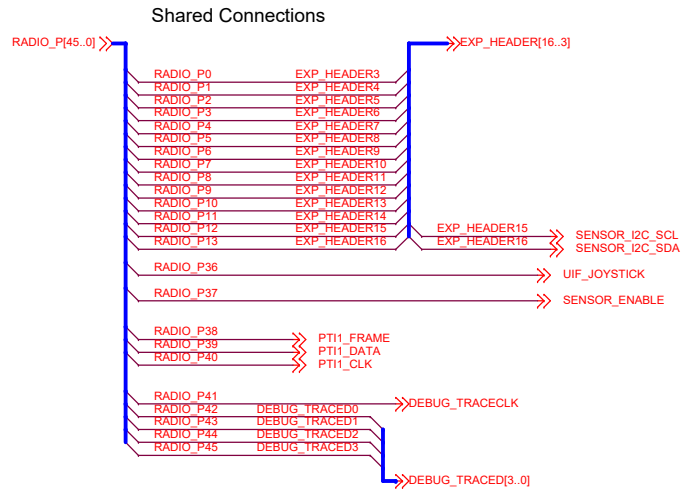
Revision: **A07**

Radio Board Socket

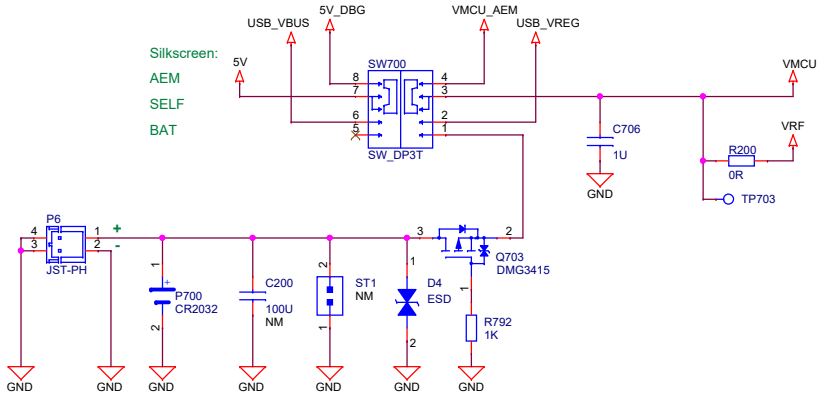


Radio Board Signal Assignments



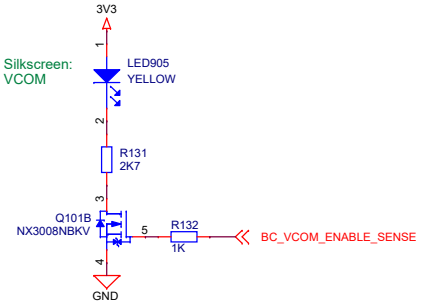


Radio Board Power Selection Switch



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



SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

Board Name: **Wireless Pro Kit Mainboard**

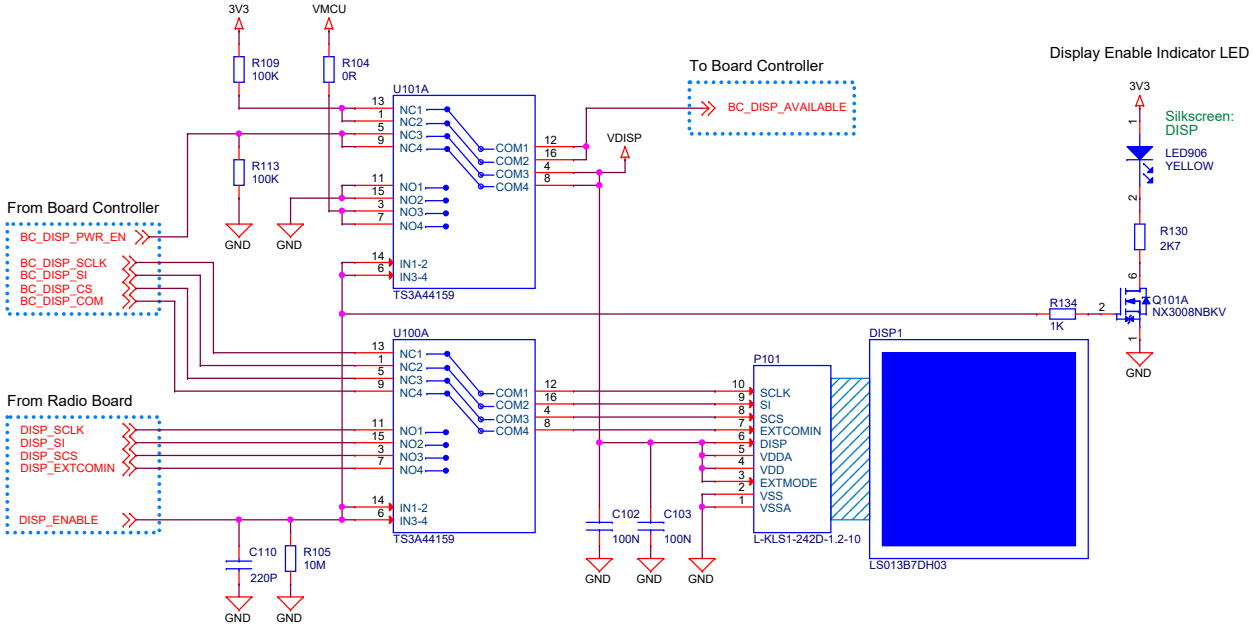
Page Title: **Radio Board Interface**

Board Number: **BRD4002A**

Revision: **A07**

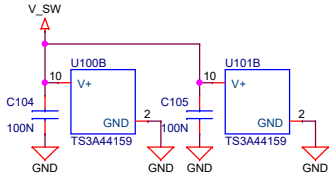
Sheet: 2 of 14

Memory LCD-TFT Display & Multiplexer

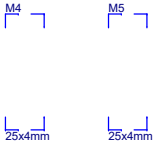


DISP_ENABLE	Display Controller	VDISP source	BC_DISP_AVAILABLE
1	Radio Board	VMCU	0
0	Control MCU	BC_DISP_PWR_EN	1

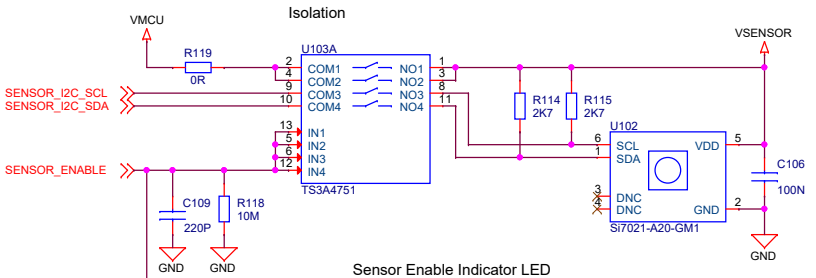
The radio board always controls ownership of the display using the DISP_ENABLE signal



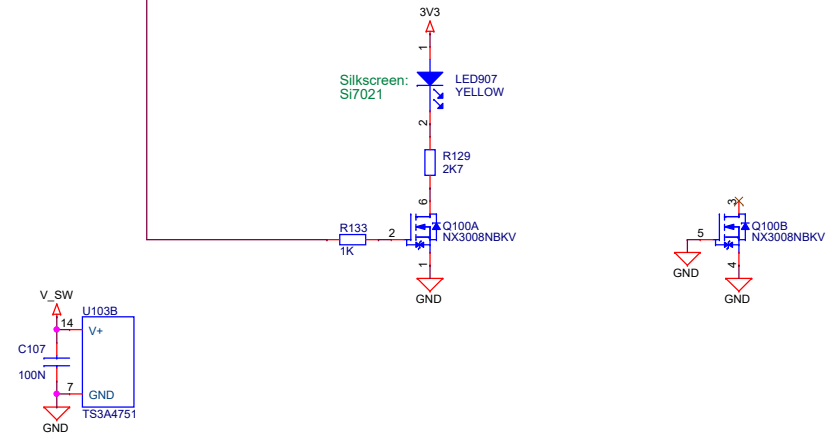
Display Mounting Tape



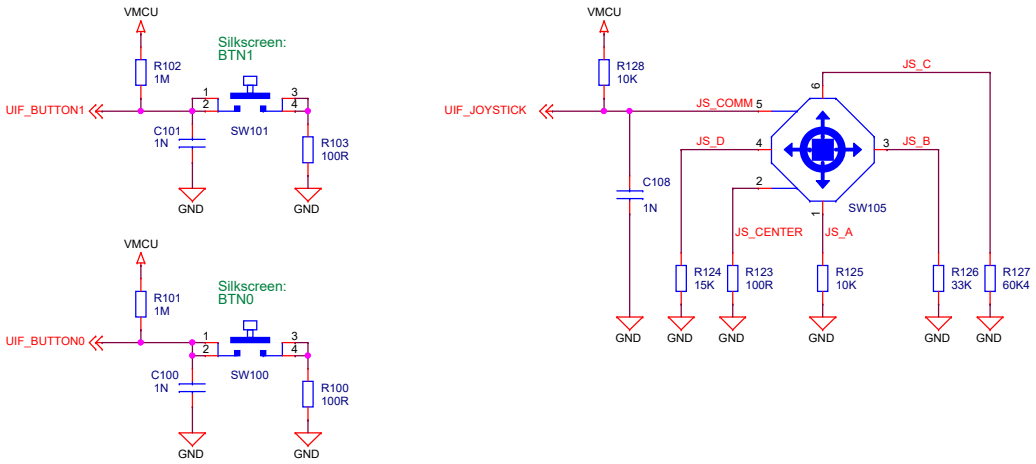
Relative Humidity & Temperature Sensor



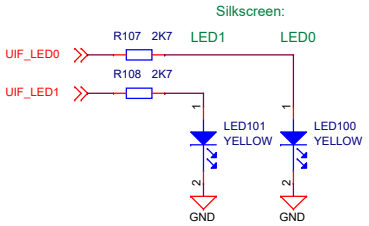
Sensor Enable Indicator LED



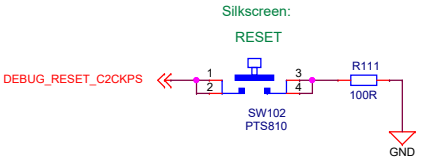
User Buttons & Joystick



User LEDs



Reset Pushbutton



SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

Board Name: **Wireless Pro Kit Mainboard**

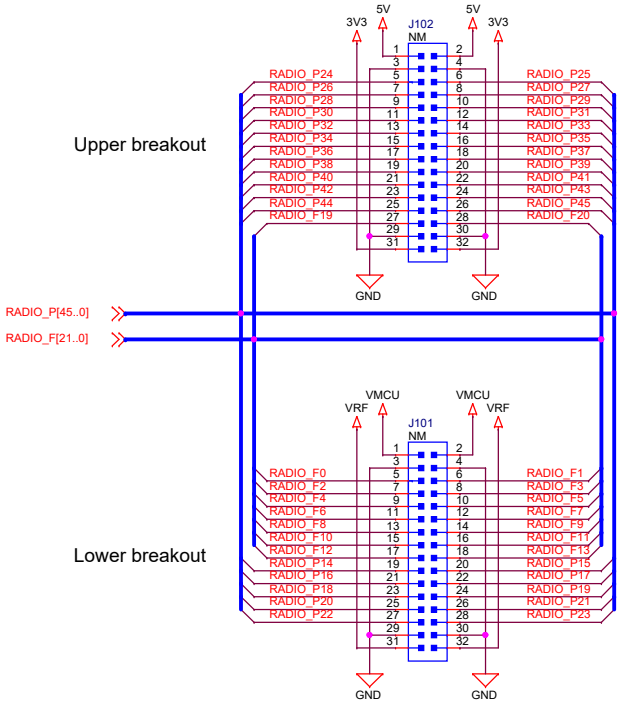
Page Title: **User Interface**

Board Number: **BRD4002A**

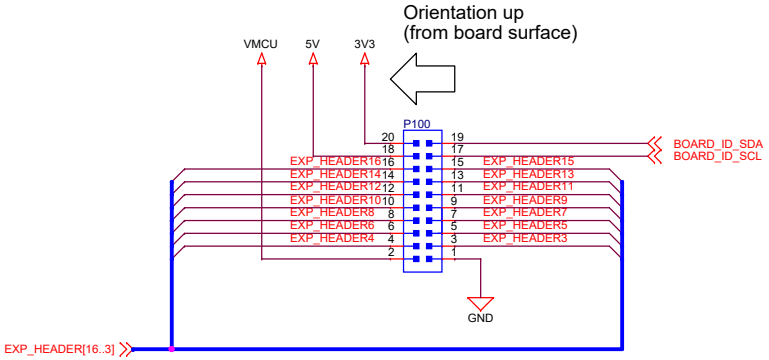
Revision: **A07**

Sheet: 3 of 14

Radio Board Breakout Connections



EXP Header



EXP header functionality

1	GND
3	
5	
7	
9	
11	
13	
15	I2C_SCL
17	Reserved for EXP Board ID
19	Reserved for EXP Board ID

2	VMCU
4	SPI_MOSI
6	SPI_MISO
8	SPI_SCLK
10	SPI_#CS
12	UART_TX
14	UART_RX
16	I2C_SDA
18	5V
20	3V3

SILICON LABS

Designed	HEL
Approved	RGU
Size	A3
Sheet Modified Date	Wednesday, January 10, 2024

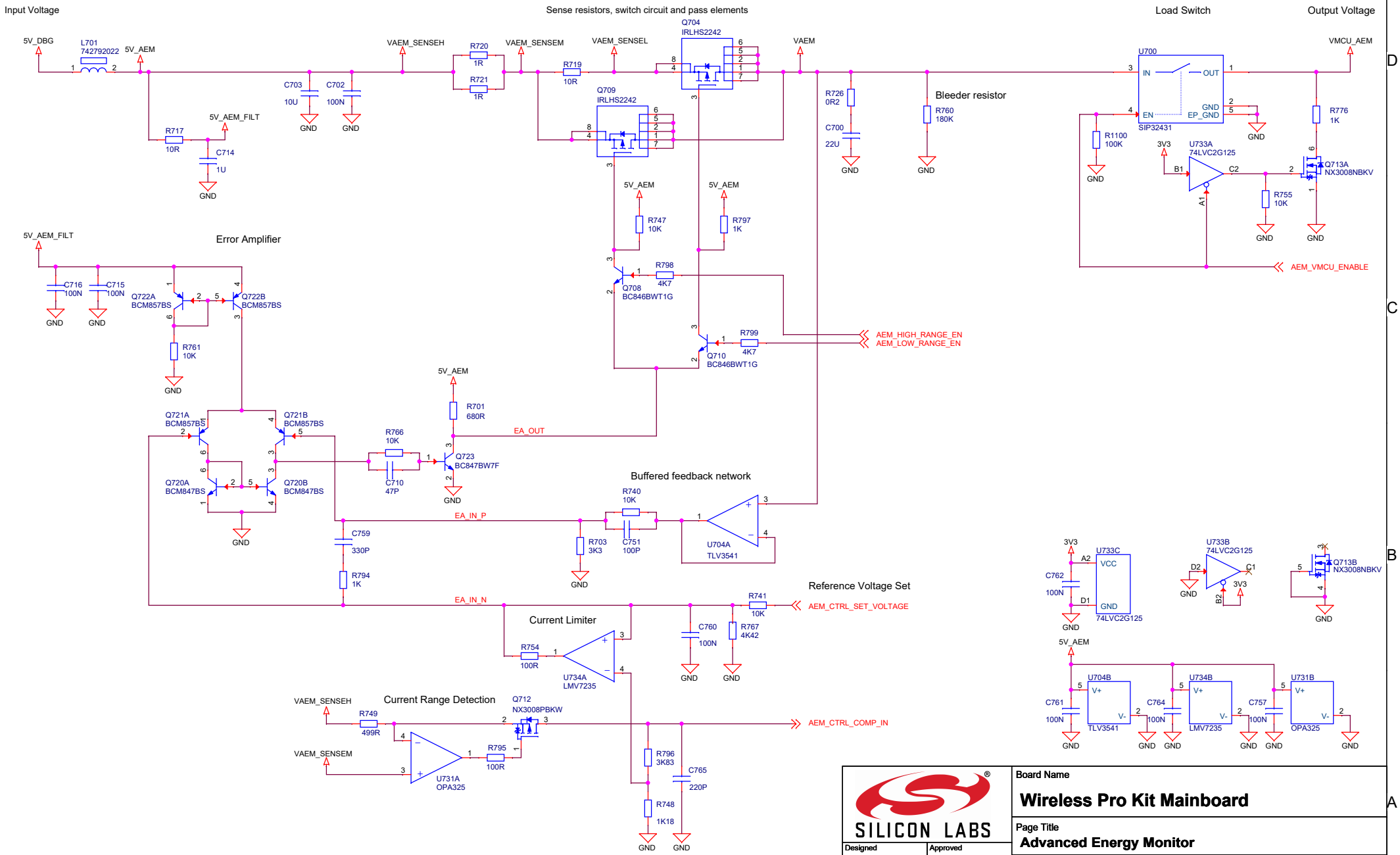
Board Name
Wireless Pro Kit Mainboard

Page Title
EXP Header & Breakout Signals

Board Number
BRD4002A

Revision
A07

Advanced Energy Monitor



SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

Board Name: Wireless Pro Kit Mainboard

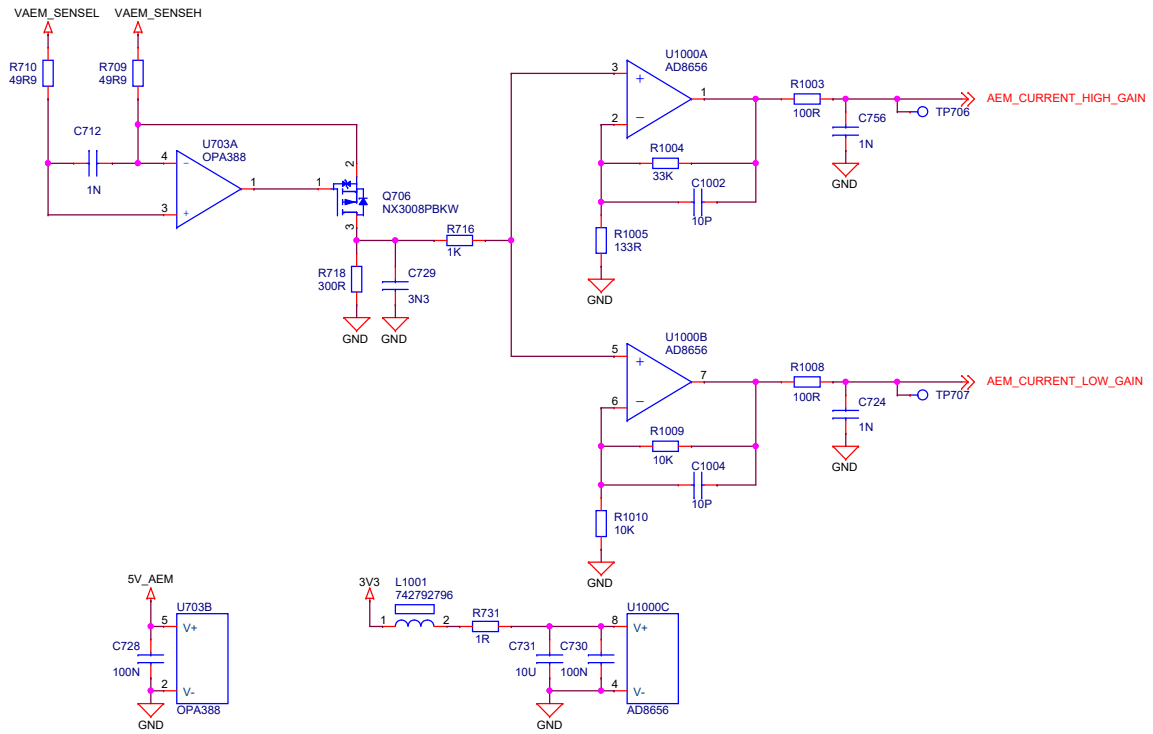
Page Title: Advanced Energy Monitor

Board Number: BRD4002A

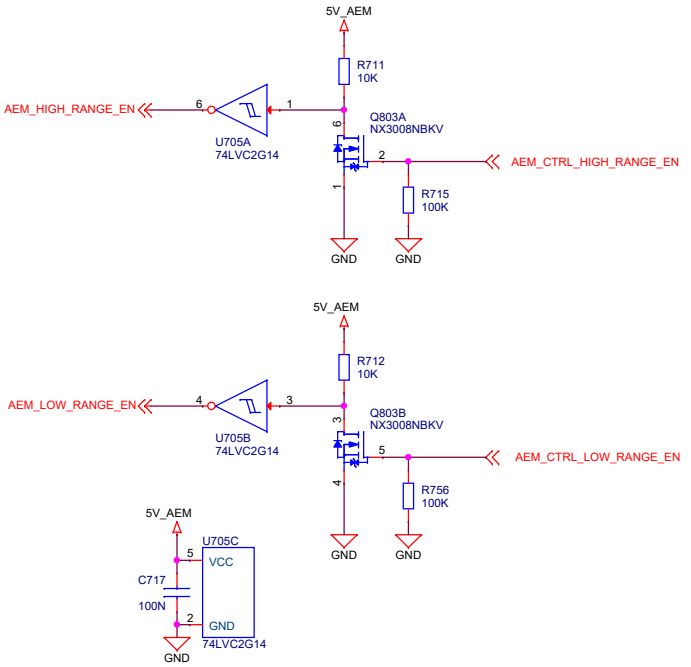
Revision: A07

Sheet: 5 of 14

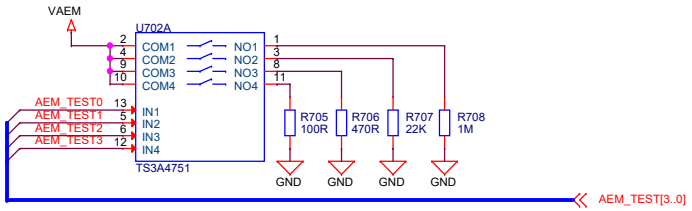
AEM Current Sense

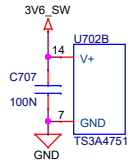


AEM Range Control



AEM Test Circuit



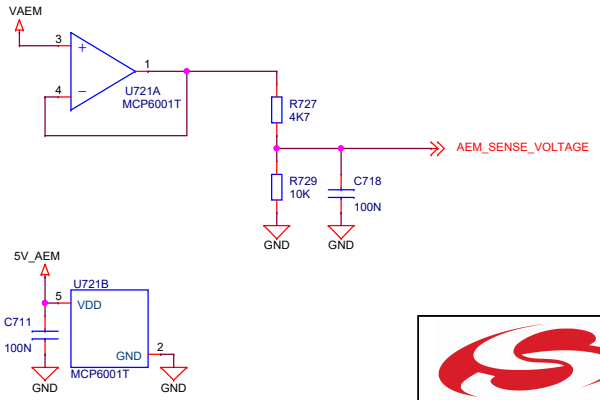


AEM_TEST	Test Current
0x1	21.6 uA
0x2	168 uA
0x4	7.04 mA
0x8	33.0 mA
0xC	40.0 mA

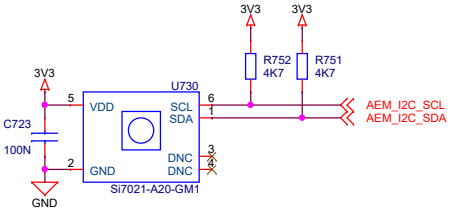
Valid for VMCU = 3.30 V

Current from bleeder resistor R760 is included.

AEM Voltage Sense



AEM Temperature Sensor



SILICON LABS

Designed	HEL
Approved	RGU
Size	A3
Sheet Modified Date	Wednesday, January 10, 2024

Board Name: **Wireless Pro Kit Mainboard**

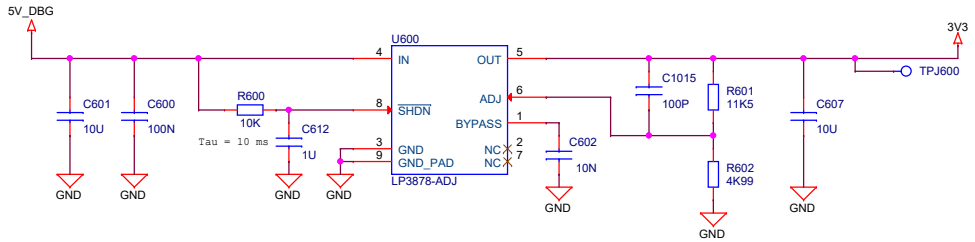
Page Title: **AEM Range Selection**

Board Number: **BRD4002A**

Revision: **A07**

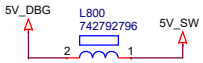
Sheet: 6 of 14

3V3 Regulator

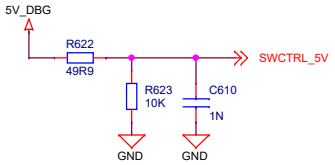


5V Misc.

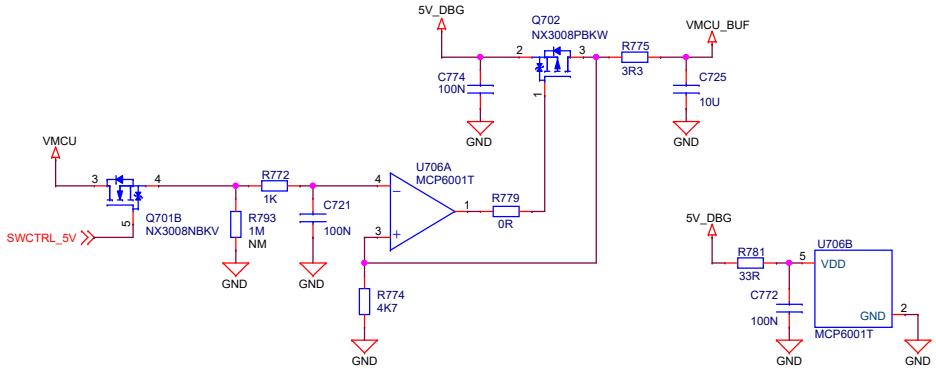
Supply for Isolation Switches



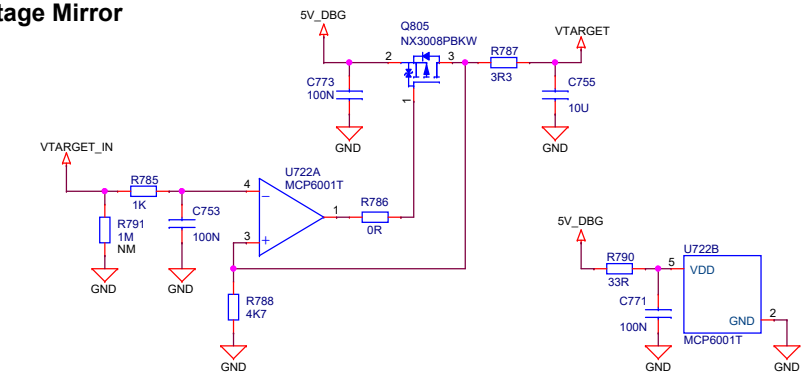
Control Signal for Isolation Switches



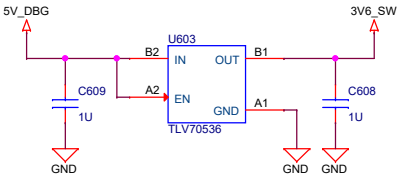
VMCU Voltage Mirror

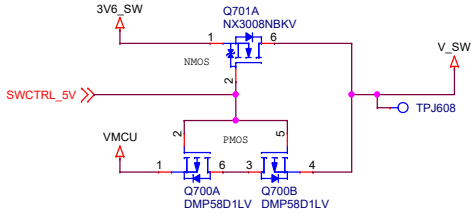


VTarget Voltage Mirror



Power Supply for Isolation Switches

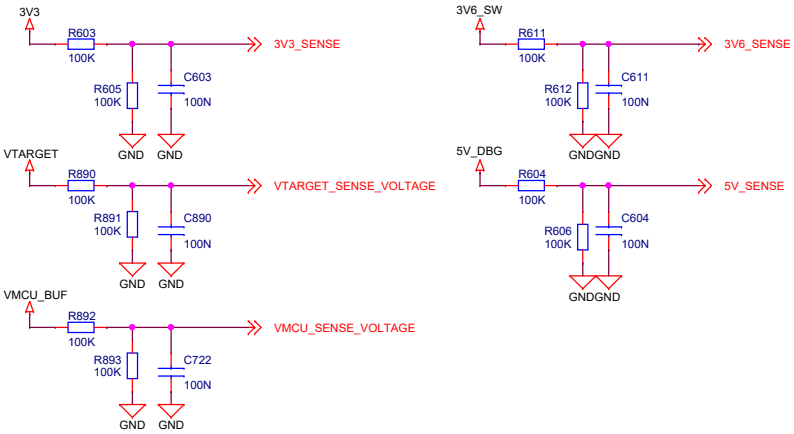




J-Link USB Cable	Q700 State	Q701A State	V_SW	VMCU_SENSE
Connected Disconnected	OFF ON	ON OFF	3.6V VMCU	VMCU Isolated

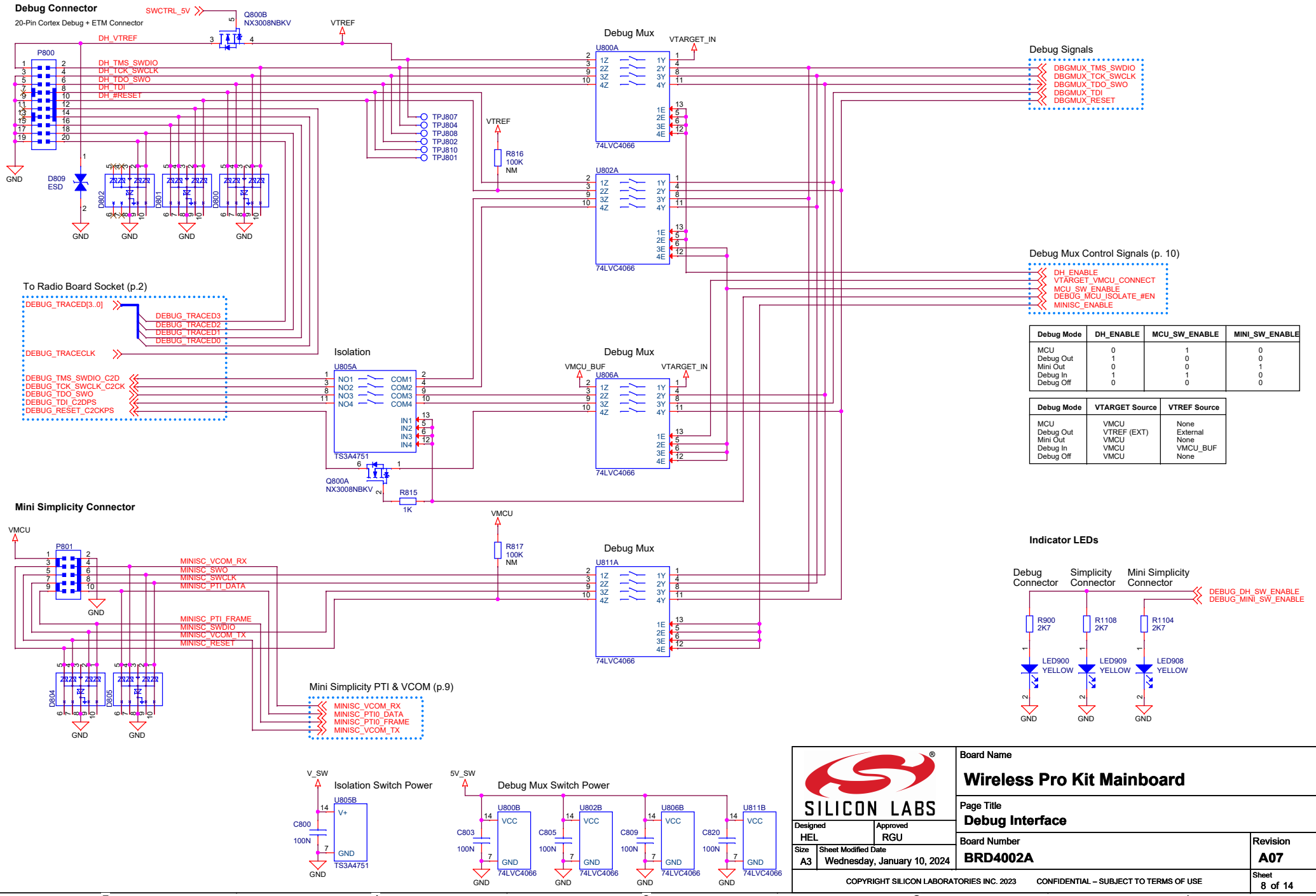
Isolation switches are powered by 3V6_SW when the USB cable is connected, otherwise by VMCU.

Voltage Sensing



Board Name	**Wireless Pro Kit Mainboard**
Page Title	**Voltage Regulators**
Designed: HEL / Approved: RGU	
Size: A3 / Sheet Modified Date: Wednesday, January 10, 2024	Board Number: **BRD4002A** / Revision: **A07**
	Sheet: 7 of 14

Debug Interface



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

SILICON LABS

Designed	HEL
Approved	RGU
Size	A3
Sheet Modified Date	Wednesday, January 10, 2024

Board Name
Wireless Pro Kit Mainboard

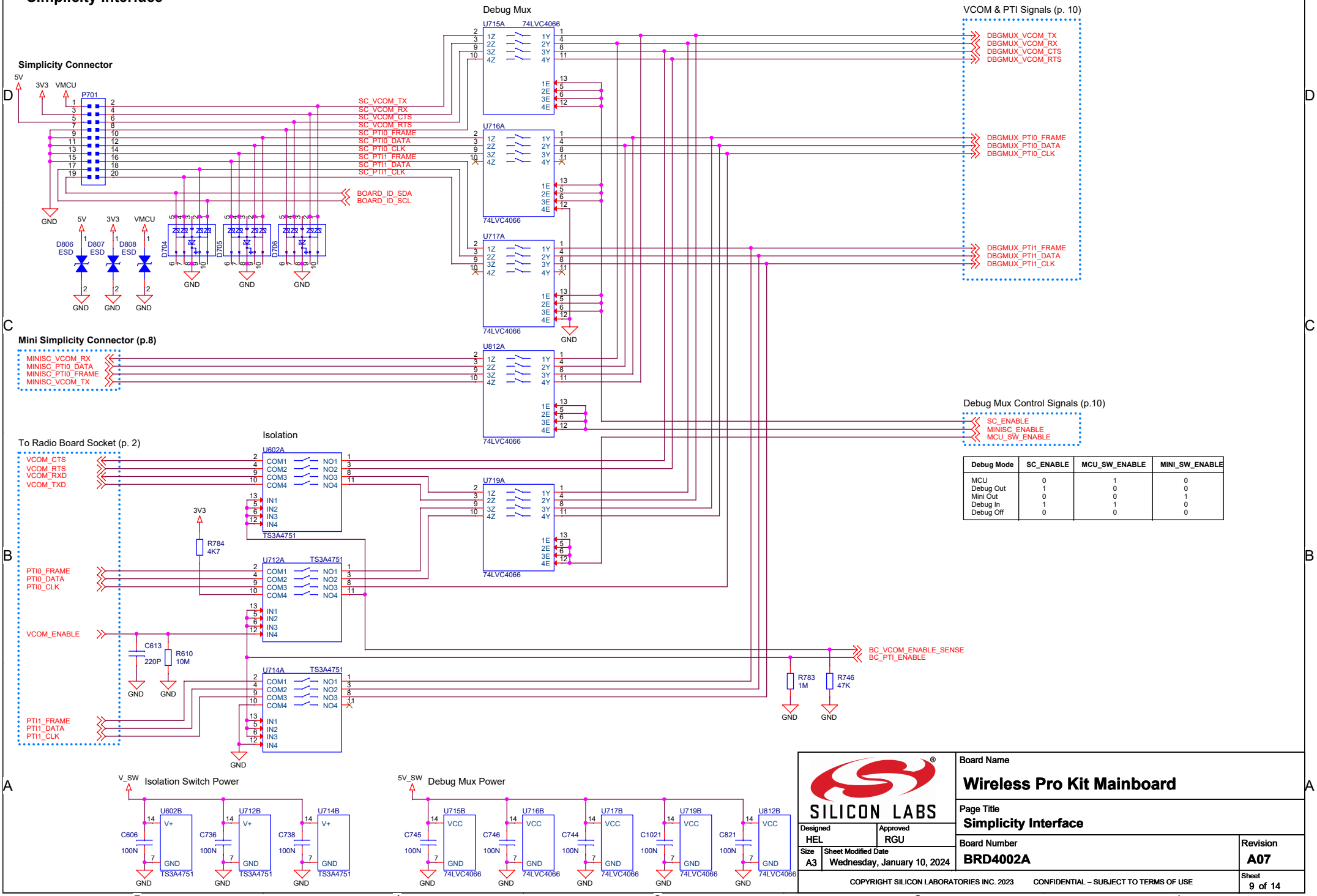
Page Title
Debug Interface

Board Number
BRD4002A

Revision
A07

Sheet
8 of 14

Simplicity Interface



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

Designed	HEL
Approved	RGU
Size	A3
Sheet Modified Date	Wednesday, January 10, 2024

Board Name
Wireless Pro Kit Mainboard

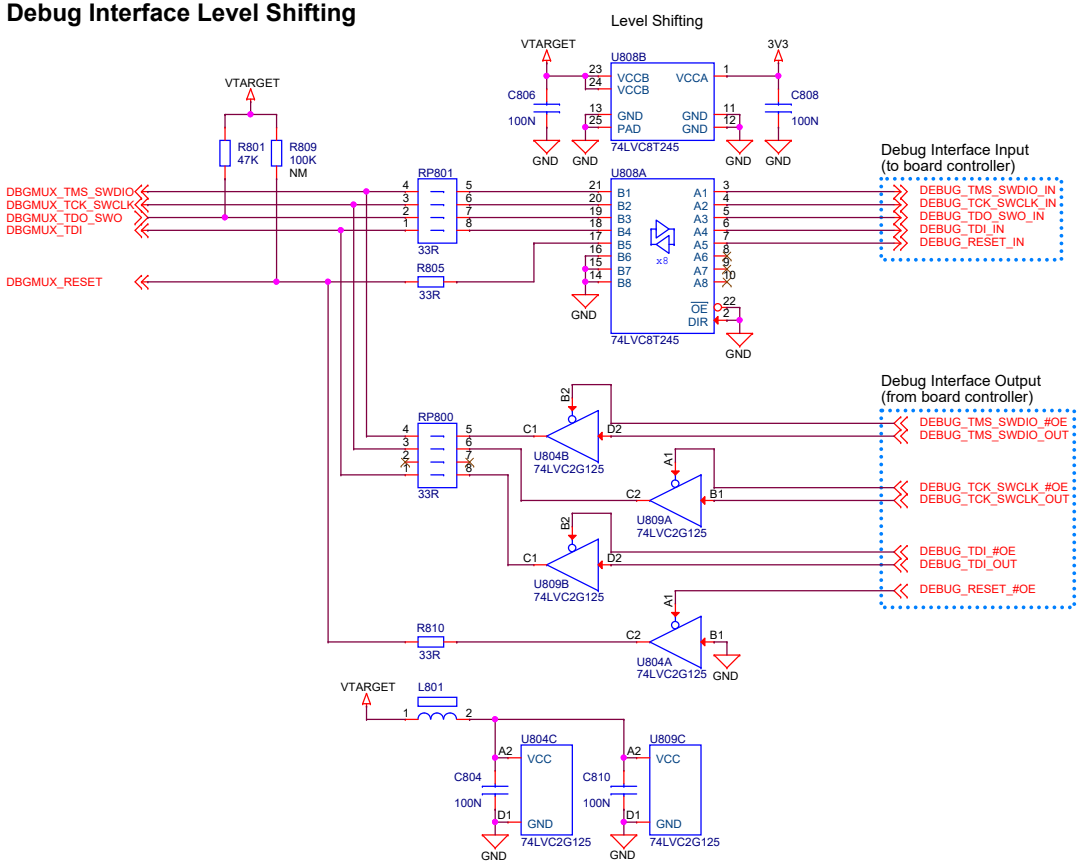
Page Title
Simplicity Interface

Board Number
BRD4002A

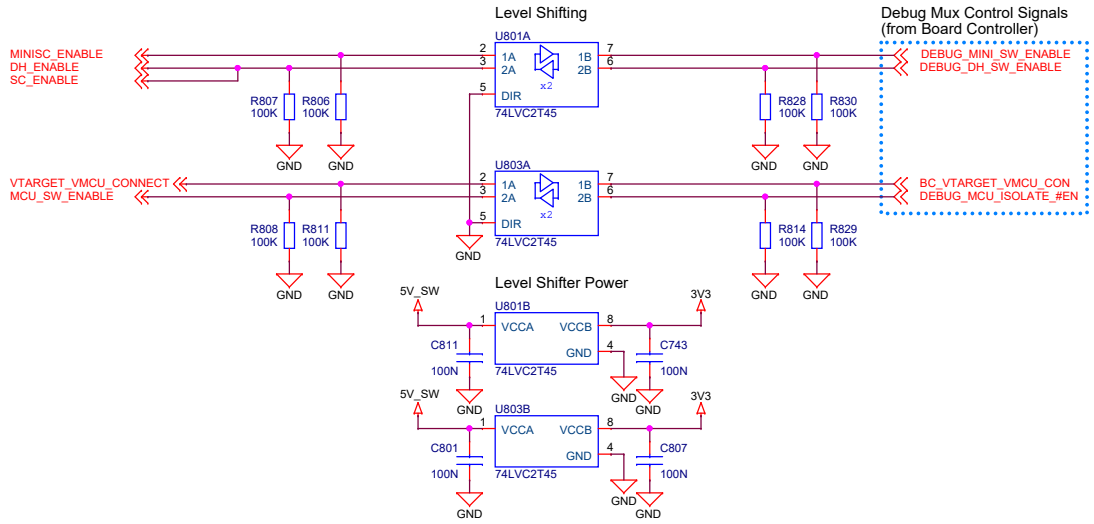
Revision
A07

Sheet
9 of 14

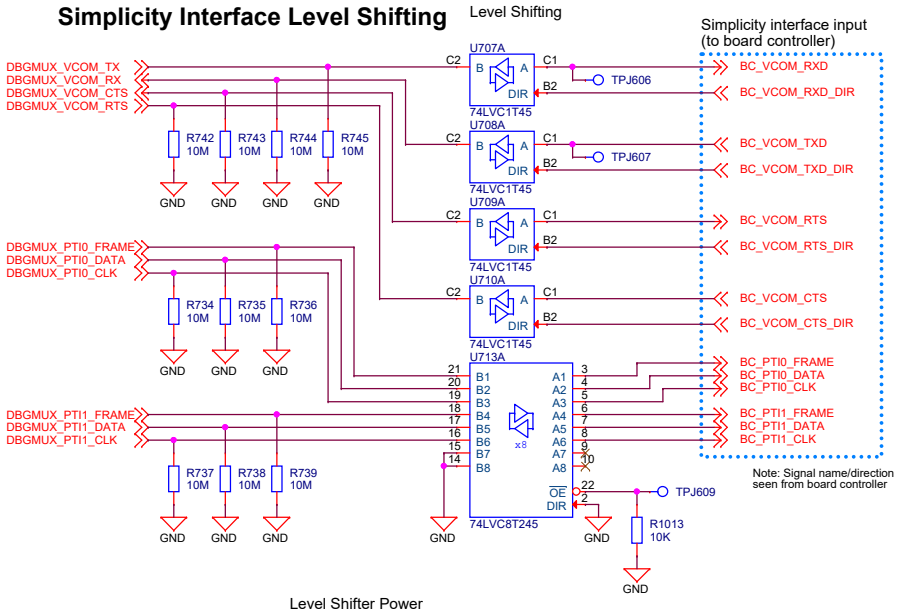
Debug Interface Level Shifting



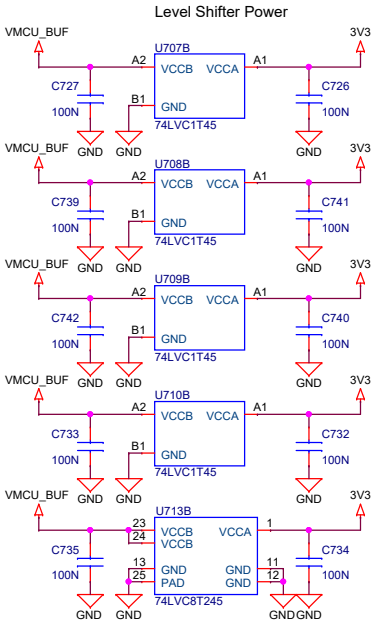
Debug Mux Control Signal Level Shifting



Simplicity Interface Level Shifting



Level Shifter Power



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	0	0
Debug In	0	0
Debug Off	0	0

SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

Board Name: **Wireless Pro Kit Mainboard**

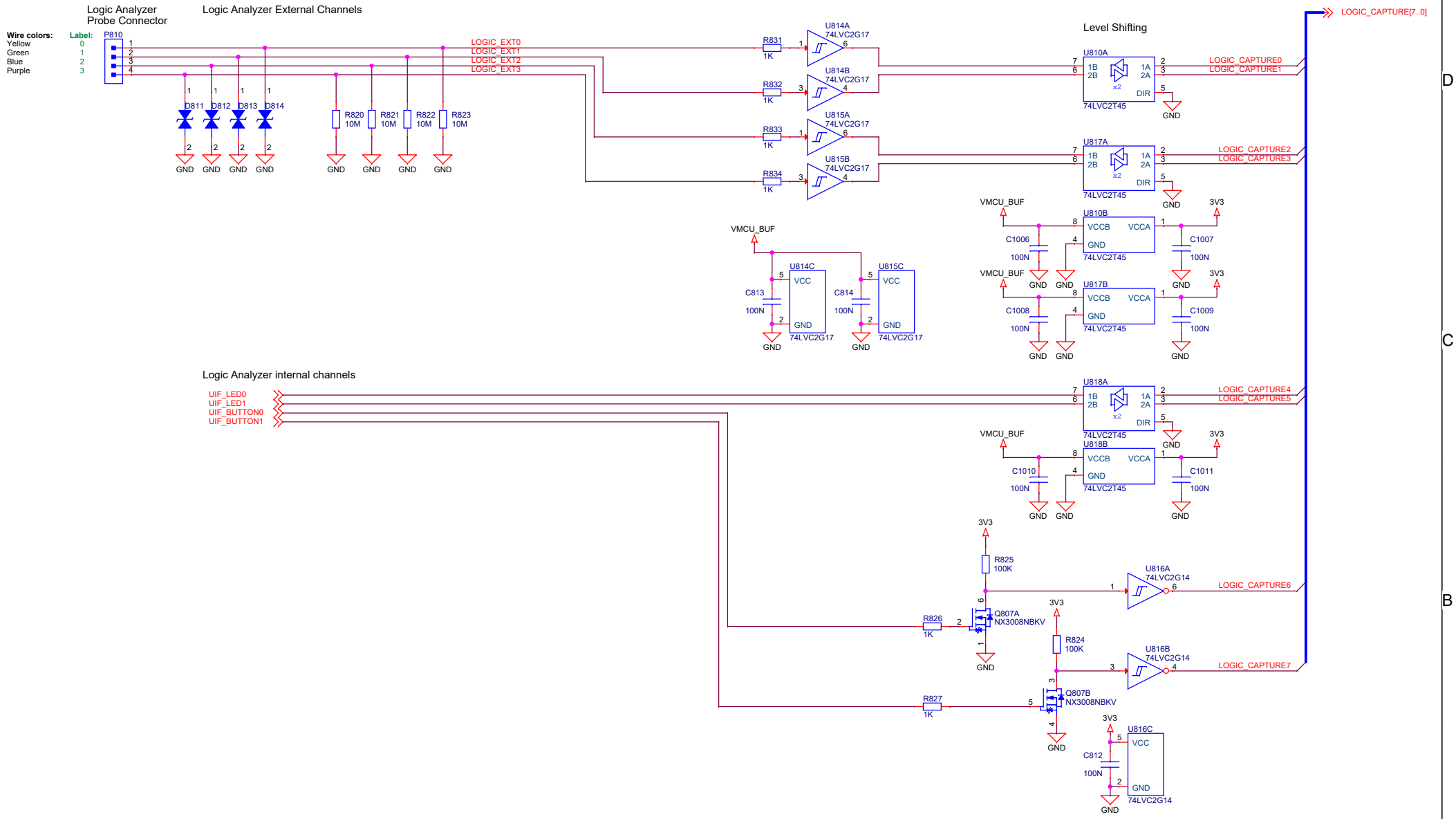
Page Title: **Debug Mux Level Shifting**

Board Number: **BRD4002A**

Revision: **A07**

Sheet: 10 of 14

Logic Analyzer Front End



SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

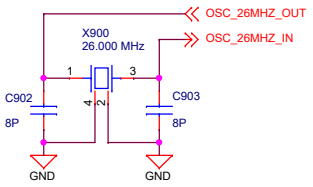
Board Name: **Wireless Pro Kit Mainboard**

Page Title: **Logic Analyzer Front End**

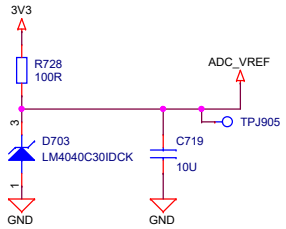
Board Number: **BRD4002A**

Revision: **A07**

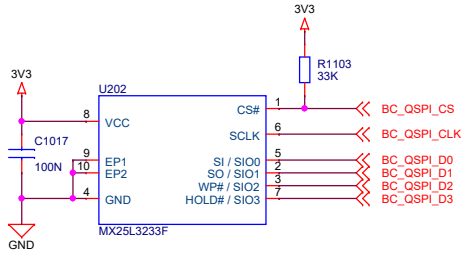
Board Controller Crystal



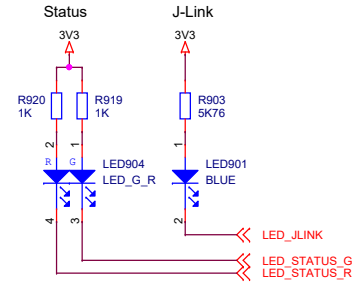
Board Controller ADC Reference



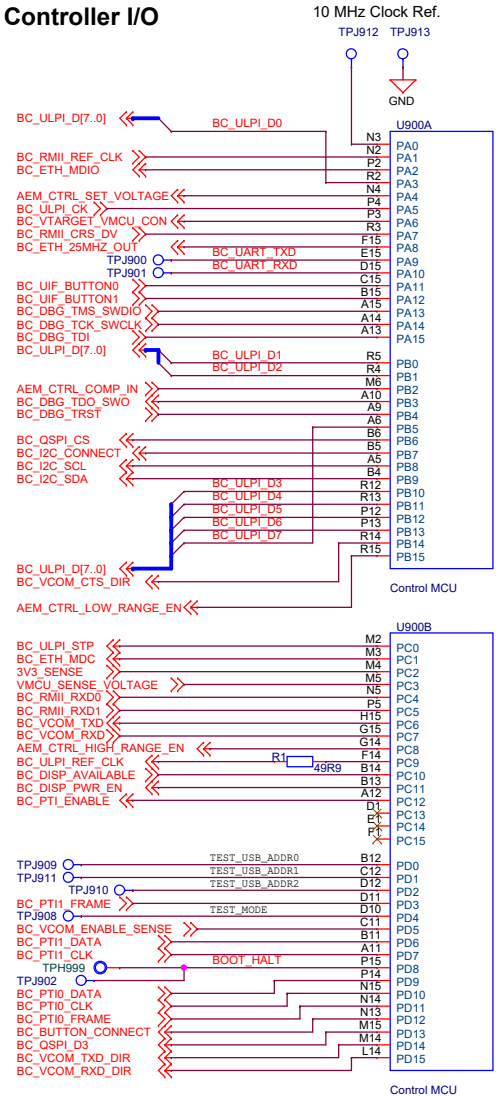
Board Controller Serial Flash Memory

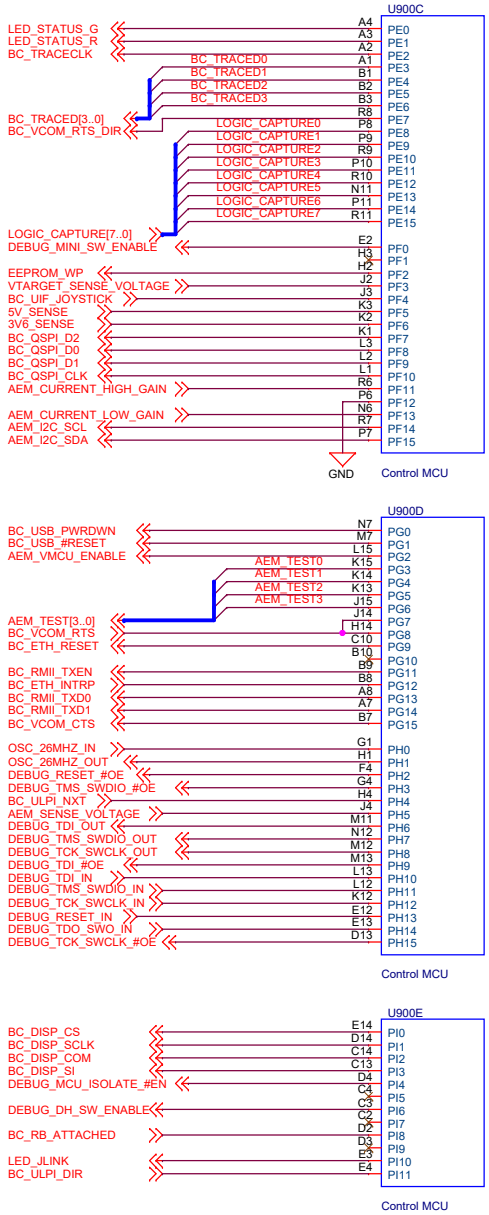


Board Controller Indicator LEDs

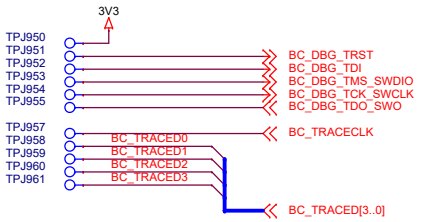


Board Controller I/O





Board Controller Test Points



SILICON LABS

Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024

Board Name: **Wireless Pro Kit Mainboard**

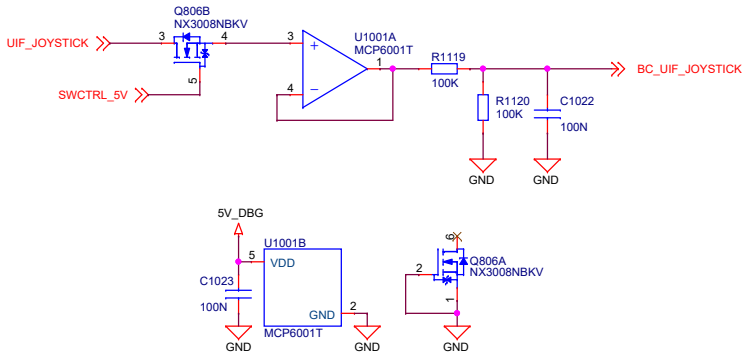
Page Title: **Board Controller I/O**

Board Number: **BRD4002A**

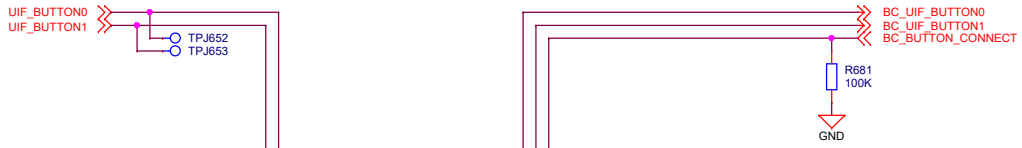
Revision: **A07**

Sheet: 12 of 14

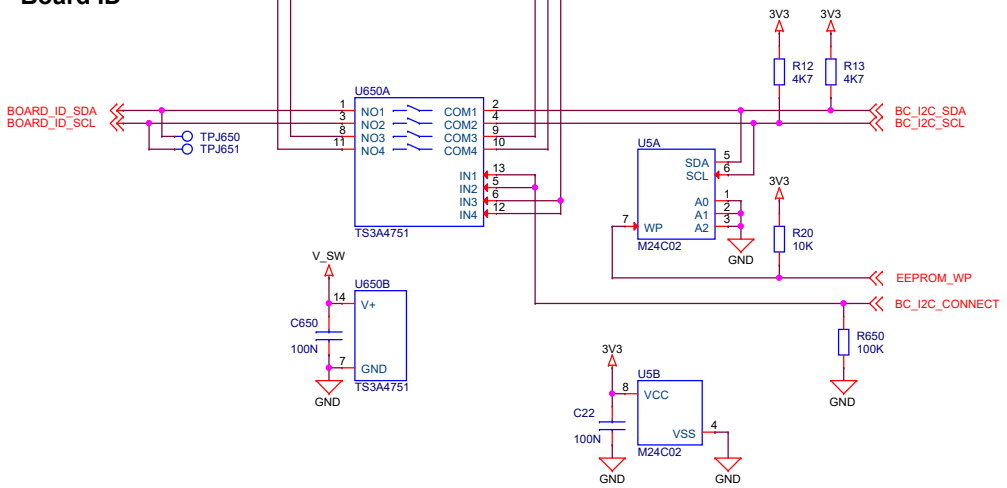
Board Controller Joystick Connection



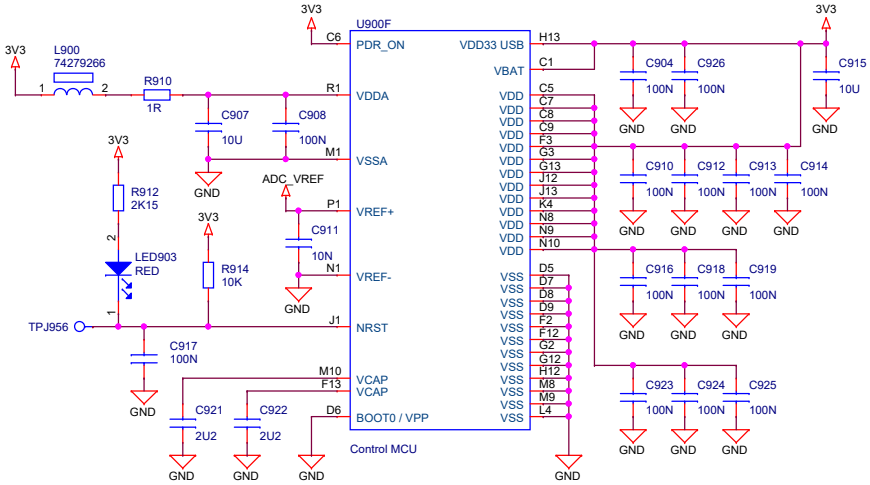
Board Controller Button Connection

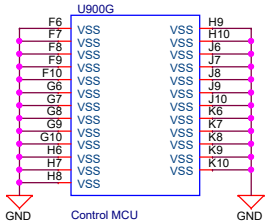


Board ID



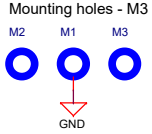
Board Controller Power & Decoupling





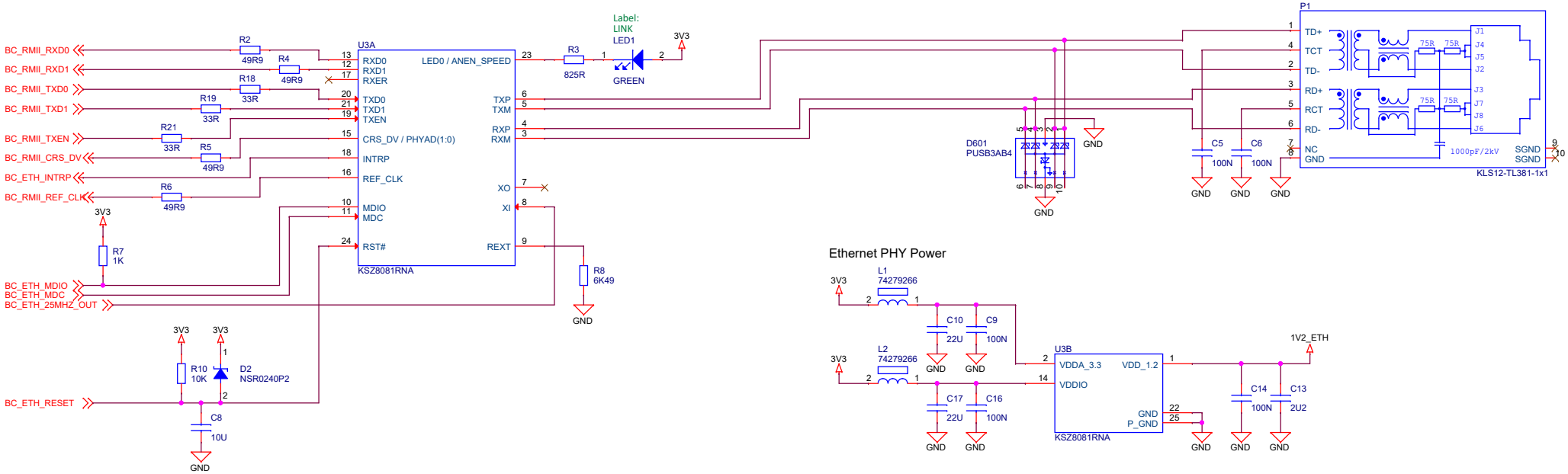
Mounting Holes

Mounting holes - M3

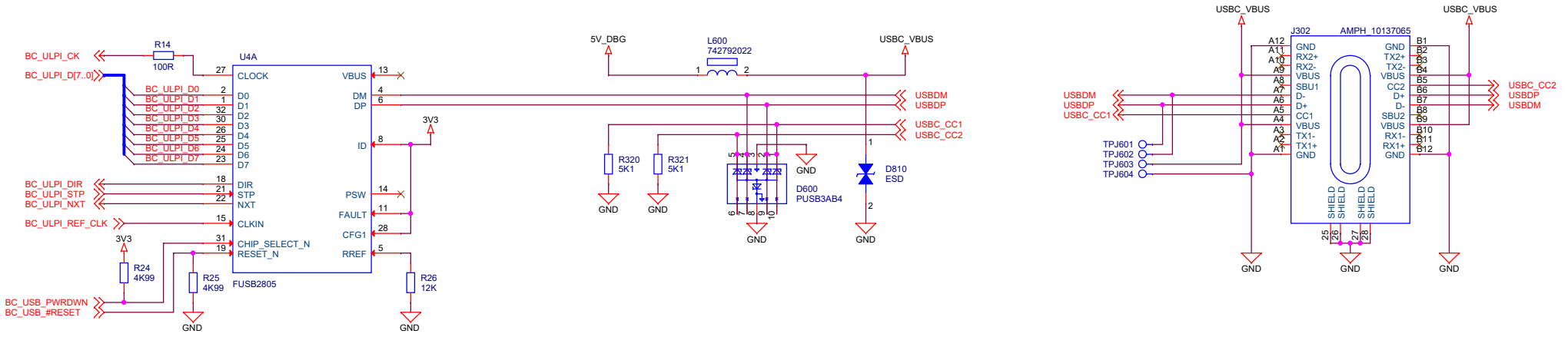


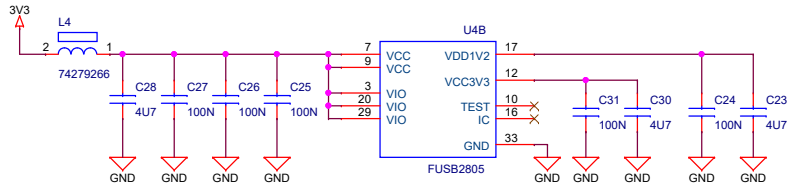
Board Name	**Wireless Pro Kit Mainboard**
Page Title	**Board Controller Power & Misc**
Designed: HEL	Approved: RGU
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024
Board Number: **BRD4002A**	Revision: **A07**
Sheet: 13 of 14	

10/100 Mbit Ethernet PHY



USB High Speed





Board Name	**Wireless Pro Kit Mainboard**
Page Title	**Board Controller USB & Ethernet**
Designed: HEL	Approved: RGU
Board Number: **BRD4002A**	Revision: **A07**
Size: A3	Sheet Modified Date: Wednesday, January 10, 2024
Sheet: 14 of 14	