


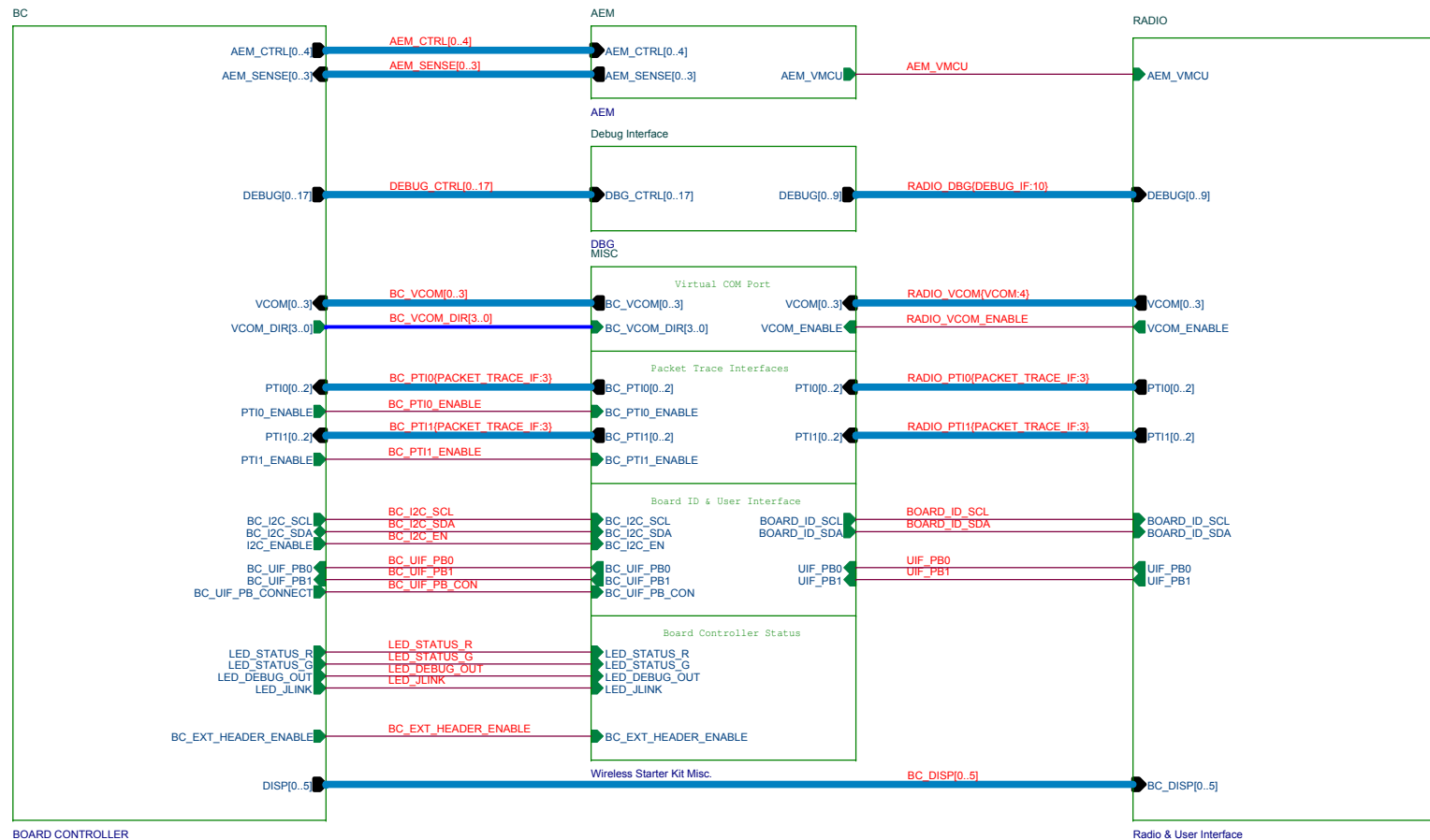


| Wireless STK Mainboard     |      |
|----------------------------|------|
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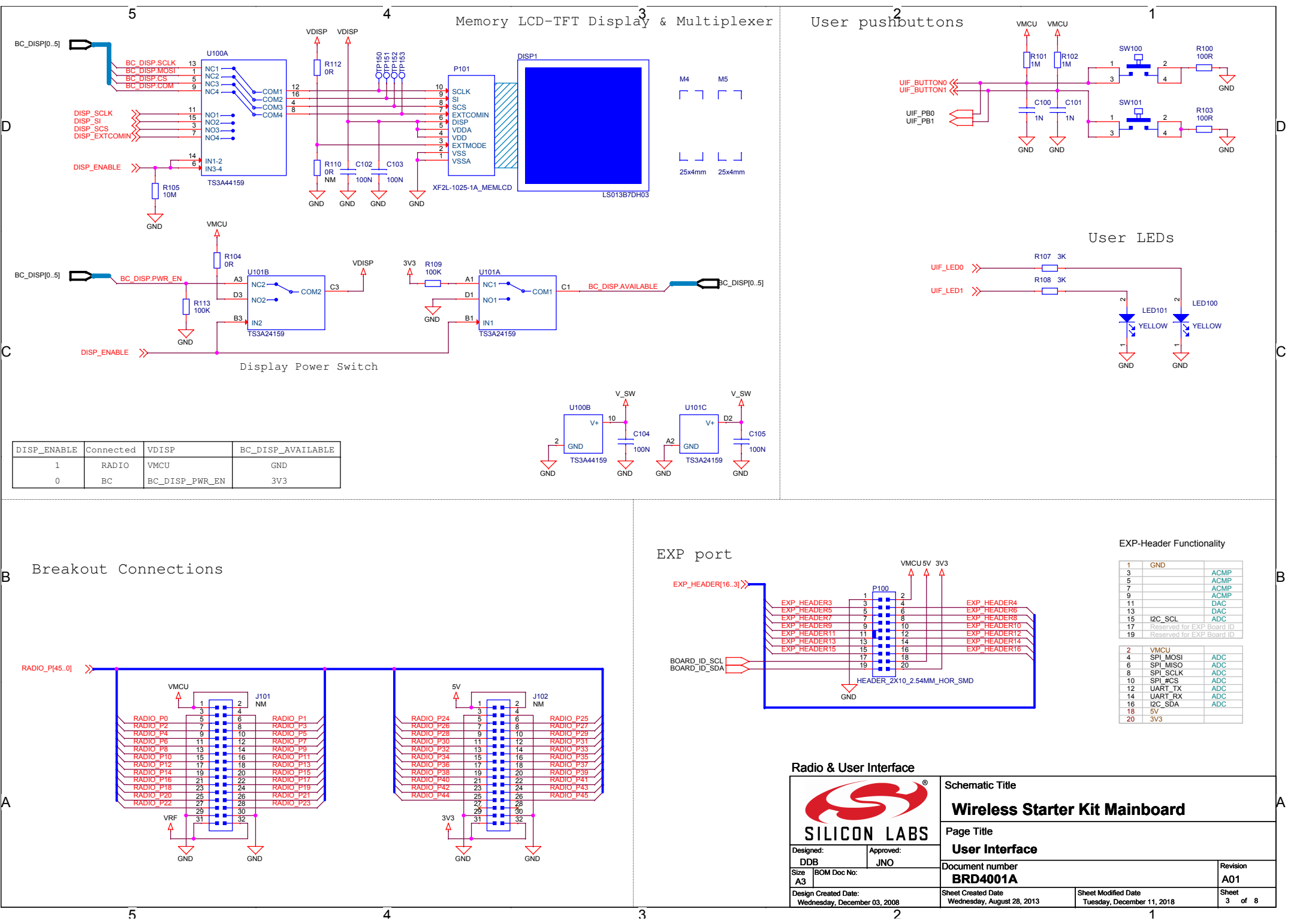
| Revision History |   |
|------------------|---|
| Rev.             | Description                               |
| A00              | Initial prodcutioin version.              |
| A01              | Minor updates for pre-production version. |
|                  |   |

|  |                         |   |   |
|--|-------------------------|---|---|
| <br><b>SILICON LABS</b> |                         | <b>Schematic Title</b><br><b>Wireless Starter Kit Mainboard</b> |   |
| <b>Page Title</b><br><b>Title Page</b>   |                         |   |   |
| Designed:<br><b>DDB</b>  | Approved:<br><b>JNO</b> |   |   |
| Size<br><b>A3</b>  | BOM Doc No:<br><br>     | Document number<br><b>BRD4001A</b>                              | Revision<br><b>A01</b>                              |
| Design Created Date:<br>Wednesday, December 03, 2008   |                         | Sheet Created Date<br>Saturday, March 21, 2009                  | Sheet Modified Date<br>Wednesday, December 12, 2018 |
|  |                         |   | Sheet<br>1 of 8                                     |



# Wireless STK

|  |  |  |  |
|--|--|--|--|
| <br><b>SILICON LABS</b> |  | Schematic Title                                |  |
|  |  | <b>Wireless Starter Kit Mainboard</b>          |  |
| Designed:<br>DDB   |  | Page Title                                     |  |
| Size<br>A3   |  | <b>Top Level Hierarchy</b>                     |  |
| BOM Doc No:  |  | Document number                                | Revision   |
| Design Created Date:   |  | <b>BRD4001A</b>                                | <b>A01</b>   |
| Wednesday, December 03, 2008   |  | Sheet Created Date<br>Wednesday, June 19, 2013 | Sheet Modified Date<br>Thursday, December 13, 2018 |
|  |  | Sheet 2 of 8                                   |  |



| DISP_ENABLE | Connected | VDISP          | BC_DISP_AVAILABLE |
|-------------|-----------|----------------|-------------------|
| 1           | RADIO     | VMCU           | GND               |
| 0           | BC        | BC_DISP_PWR_EN | 3V3               |

| EXP-Header Functionality |                           |      |  |
|--------------------------|---------------------------|------|--|
| 1                        | GND                       |      |  |
| 3                        |                           | ACMP |  |
| 5                        |                           | ACMP |  |
| 7                        |                           | ACMP |  |
| 9                        |                           | ACMP |  |
| 11                       |                           | DAC  |  |
| 13                       |                           | DAC  |  |
| 15                       | I2C_SCL                   | ADC  |  |
| 17                       | Reserved for EXP Board ID |      |  |
| 19                       | Reserved for EXP Board ID |      |  |
| 2                        | VMCU                      |      |  |
| 4                        | SPI_MOSI                  | ADC  |  |
| 6                        | SPI_MISO                  | ADC  |  |
| 8                        | SPI_SCLK                  | ADC  |  |
| 10                       | SPI_CS                    | ADC  |  |
| 12                       | UART_TX                   | ADC  |  |
| 14                       | UART_RX                   | ADC  |  |
| 16                       | I2C_SDA                   | ADC  |  |
| 18                       | 5V                        |      |  |
| 20                       | 3V3                       |      |  |



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Designed: DDB  
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Sheet Created Date: Wednesday, August 28, 2013  
Sheet Modified Date: Tuesday, December 11, 2018

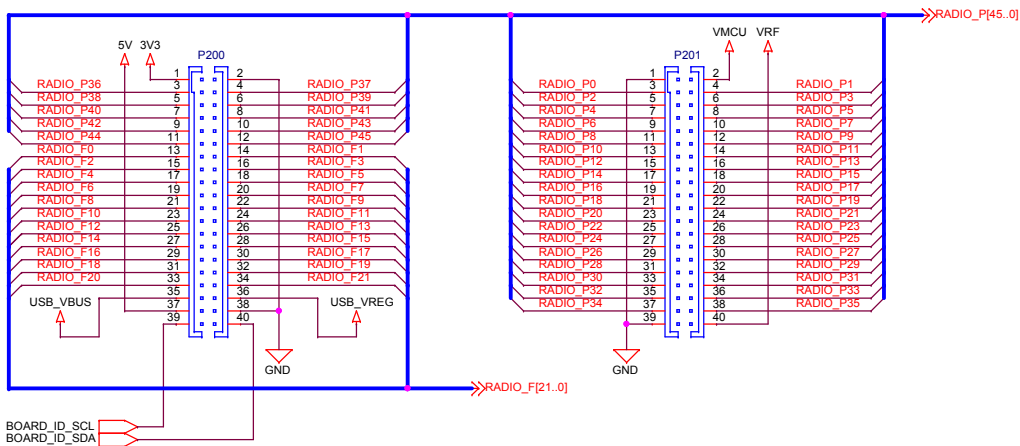
Schematic Title: **Wireless Starter Kit Mainboard**

Page Title: **User Interface**

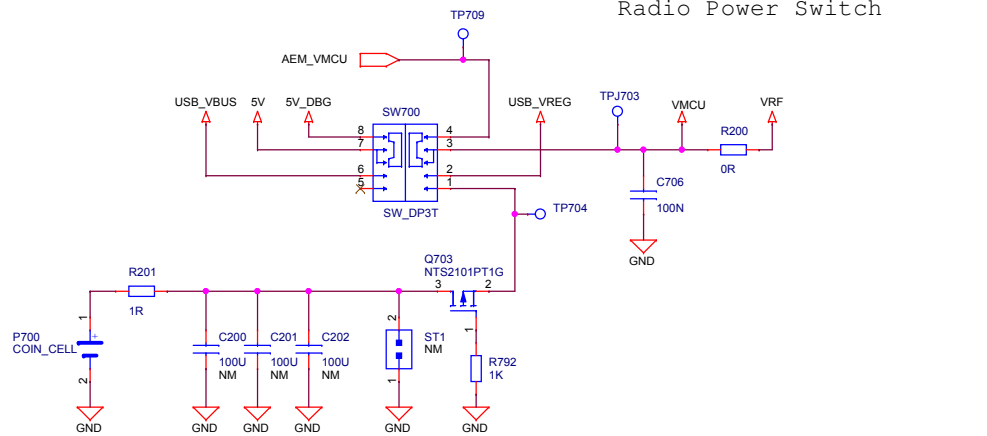
Revision: **A01**

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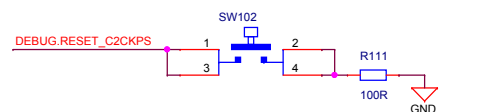
## Radio Board Connectors



## Radio Power Switch

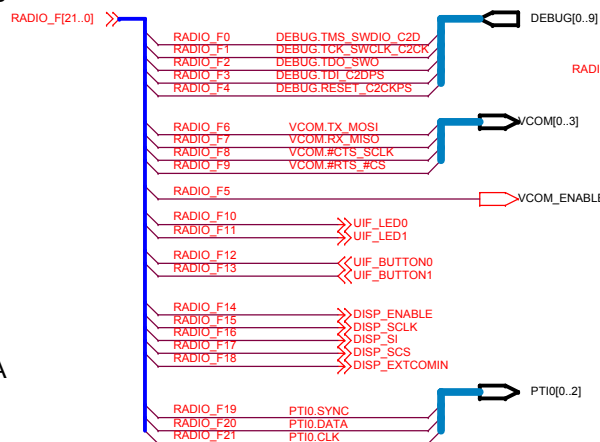


## Radio Reset

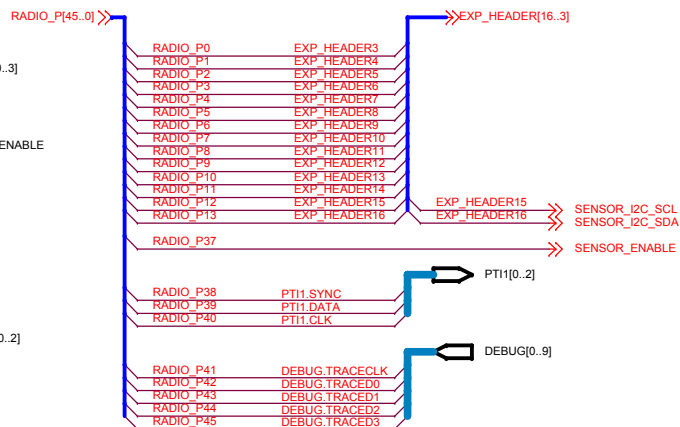


| Switch Pos. | Target Supply     | EXP Header 5V   |
|-------------|-------------------|-----------------|
| 1           | Output from AEM   | J-Link 5V_DBG   |
| 2           | Target USB_VREG   | Target USB_VBUS |
| 3           | Coin Cell Battery | (J-Link 5V_DBG) |

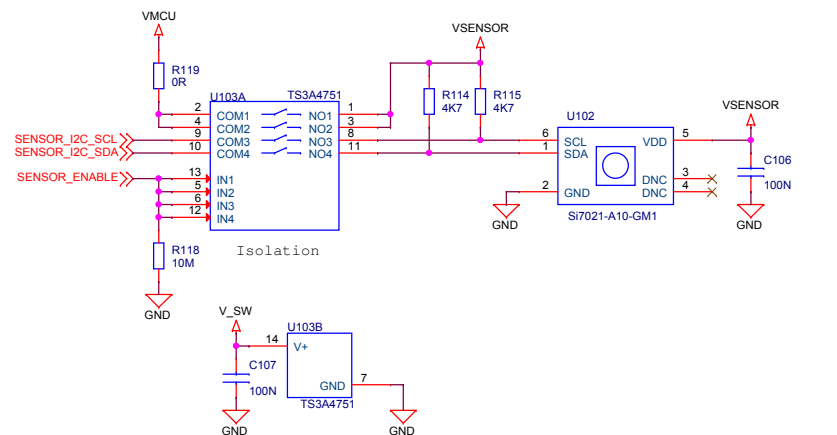
## Dedicated functions on RF Board Connectors



## Functions shared with breakout pins on RF Board Connectors



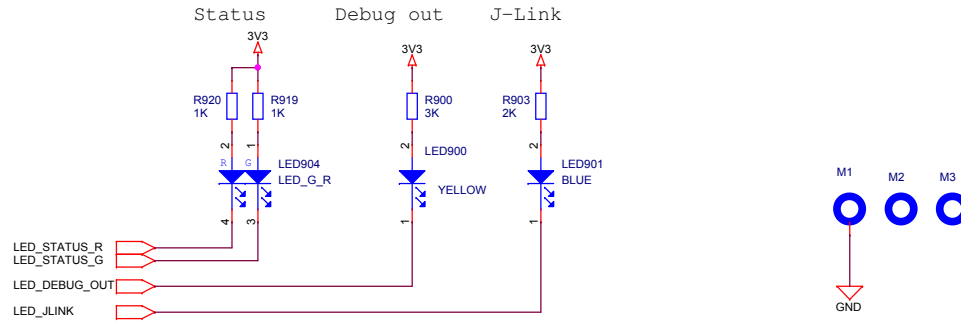
## Relative Humidity & Temperature Sensor



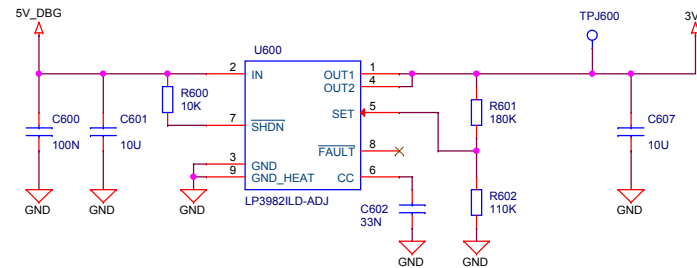
## Radio & User Interface

|   |  |   |              |
|---|--|---|--------------|
|   |  | Schematic Title                                   |              |
|   |  | <b>Wireless Starter Kit Mainboard</b>             |              |
| Page Title  |  | <b>Radio Module Interface</b>                     |              |
| Designed: DDB                                     | Approved: JNO                                  | Document number                                   | Revision     |
| Size A3   | BOM Doc No:                                    | <b>BRD4001A</b>                                   | <b>A01</b>   |
| Design Created Date: Wednesday, December 03, 2008 | Sheet Created Date: Wednesday, August 28, 2013 | Sheet Modified Date: Wednesday, December 12, 2018 | Sheet 4 of 8 |

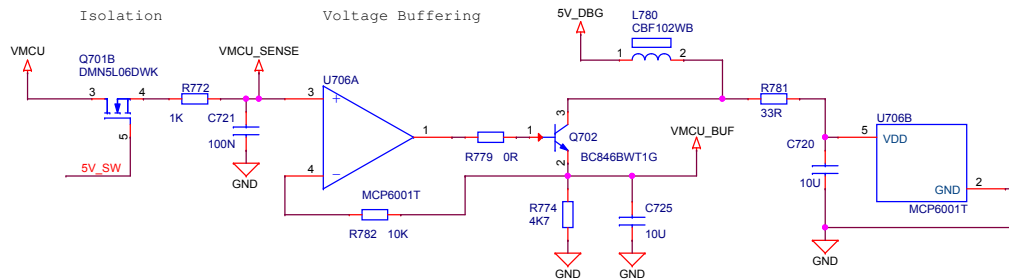
## Indicators:



## 3V3 Regulator



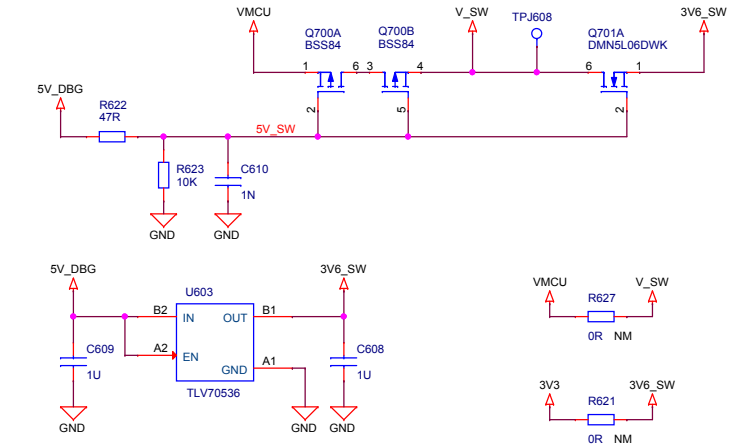
## VMCU Voltage Mirror



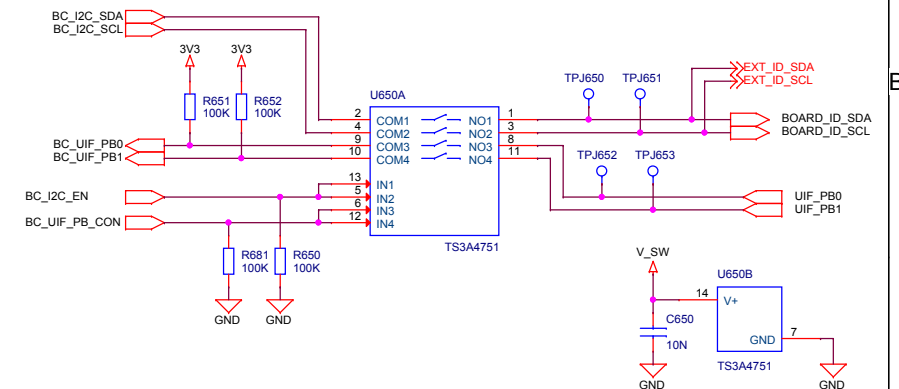
## Power Supply for Analog Switches

Analog switches used for isolation are powered by 3V6\_SW when the USB cable is connected, otherwise by VMCU.


| J-Link USB Cable | PMOS State | NMOS State | V_SW      | VMCU_SENSE |
|------------------|------------|------------|-----------|------------|
| Connected        | Off        | ON         | 3.6V VMCU | VMCU       |
| Disconnected     | ON         | OFF        | 3.6V VMCU | Isolated   |

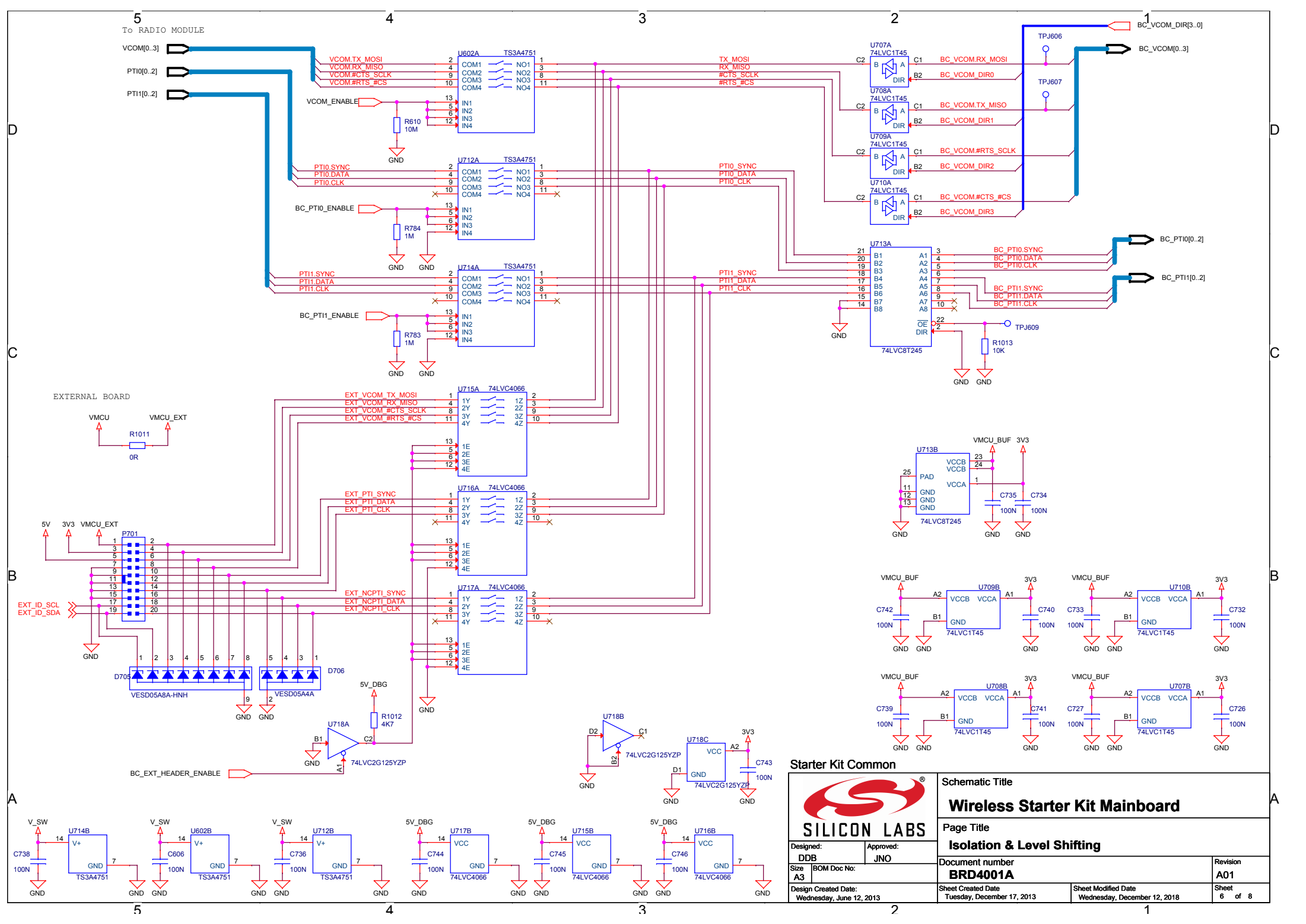


## I2C & Push Button <-> Board Controller Isolation



## Starter Kit Common

|   |  |                                |  |
|---|--|--------------------------------|--|
|  |  | Schematic Title                |  |
|   |  | Wireless Starter Kit Mainboard |  |
| Designed: DDB   |  | Page Title                     |  |
| Size A3   |  | Voltage Regulators             |  |
| BOM Doc No:   |  | Document number                |  |
| Design Created Date: Wednesday, June 12, 2013   |  | BRD4001A                       |  |
| Approved: JNO   |  | Revision                       |  |
| Sheet Created Date: Tuesday, June 18, 2013  |  | A01                            |  |
| Sheet Modified Date: Wednesday, December 12, 2018                                     |  | Sheet 5 of 8                   |  |





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**Starter Kit Common**

Designed: DDB  
Size: A3  
BOM Doc No:  
Design Created Date: Wednesday, June 12, 2013

Approved: JNO  
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Sheet Modified Date: Wednesday, December 12, 2018

**Schematic Title**

**Wireless Starter Kit Mainboard**

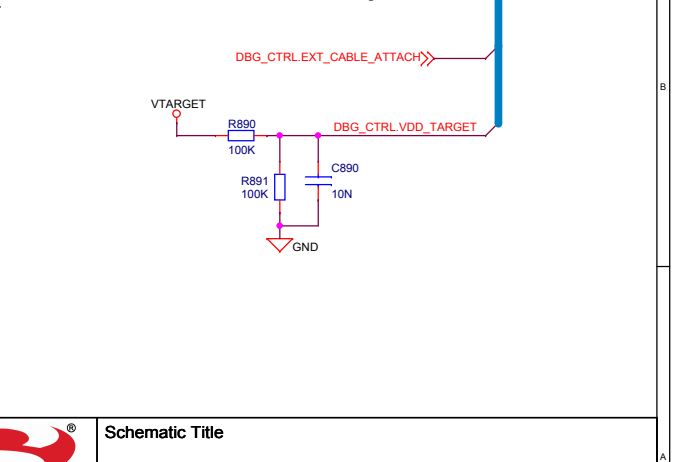
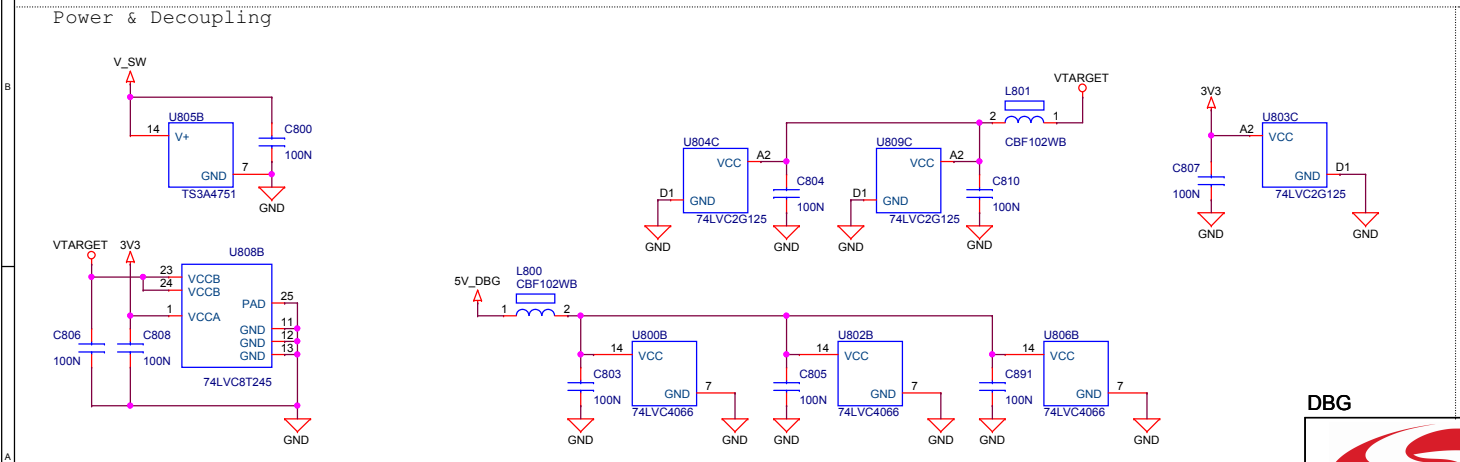
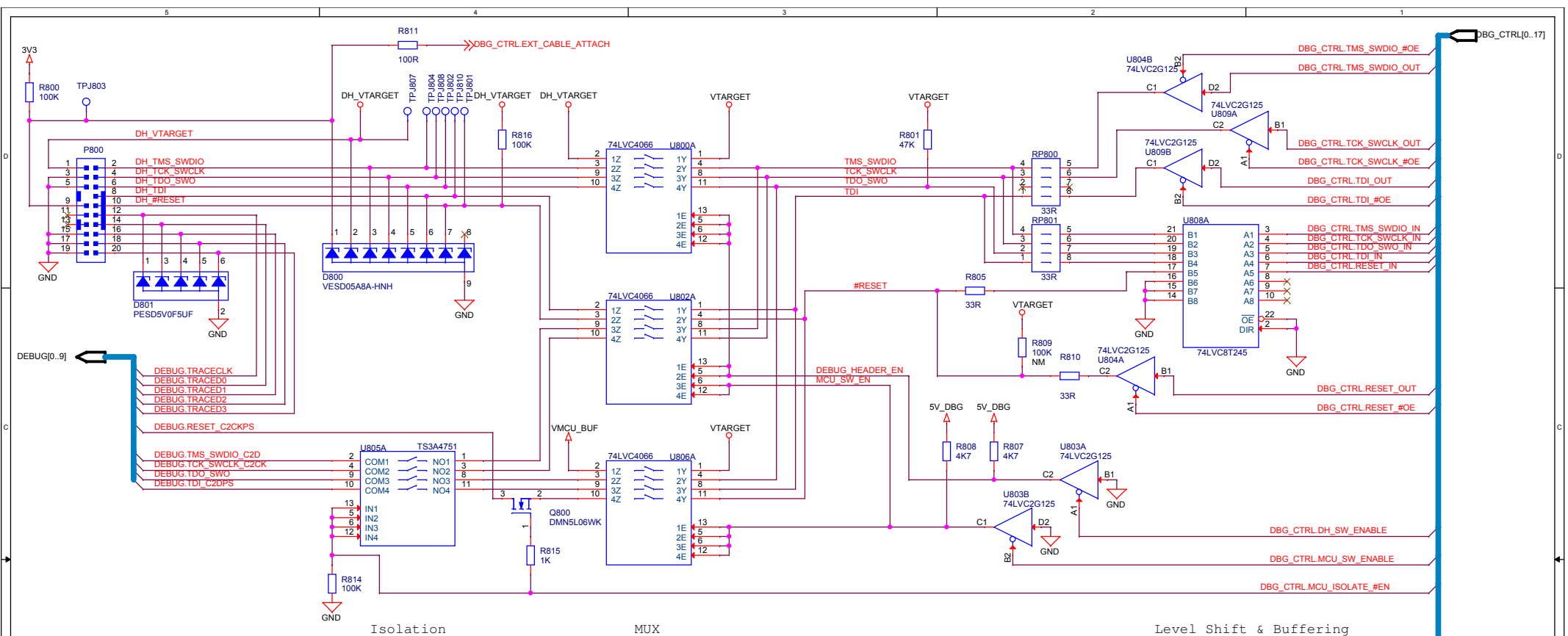
**Page Title**

**Isolation & Level Shifting**


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**A01**

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| Mode      | DEBUG_MCU_SW_ENABLE | DEBUG_DH_SW_ENABLE | DEBUG_BUF_#OE | ISOLATE_#EN | DH_VTARGET       | VTARGET          |
|-----------|---------------------|--------------------|---------------|-------------|------------------|------------------|
| Debug Out | 0                   | 1                  | 0             | 0           | External voltage | External voltage |
| MCU Debug | 1                   | 0                  | 0             | 1           | Disconnected     | VMCU             |
| Debug In  | 1                   | 1                  | 1             | 1           | VMCU             | VMCU             |
| Debug Off | 0                   | 0                  | 1             | 0           | -                | -                |



**SILICON LABS**

**Schematic Title**

**Wireless Starter Kit Mainboard**

**Page Title**

**Debug Multiplexer**

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Revision

**A01**

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