



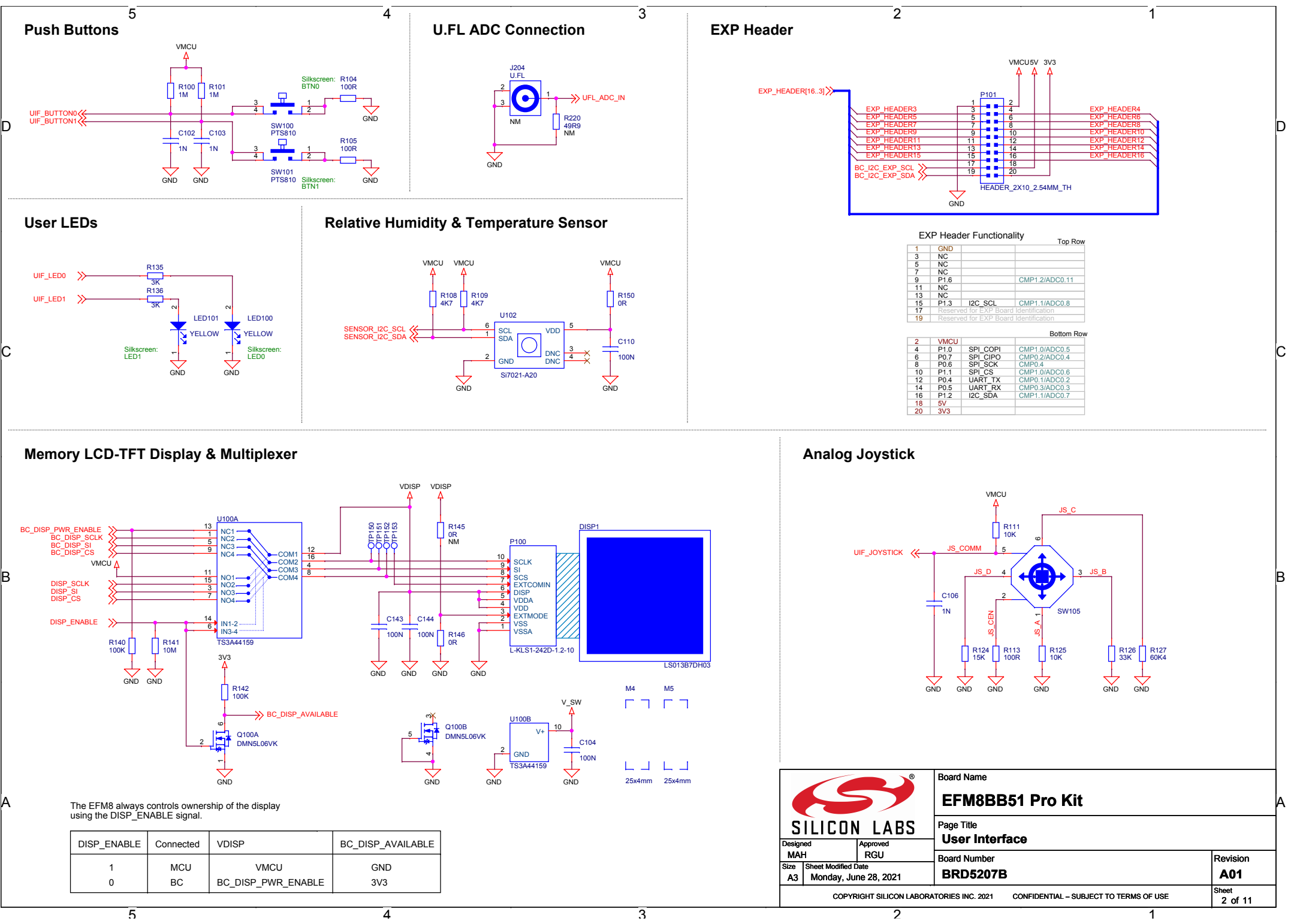
LEGAL NOTICE:
SILICON LABORATORIES INC. ("SILICON LABS") AND/OR ITS LICENSORS DO NOT WARRANT THE ACCURACY OR COMPLETENESS OF THIS SCHEMATIC OR ANY INFORMATION CONTAINED WITHIN THIS SCHEMATIC. IT IS PROVIDED "AS-IS" FOR REFERENCE ONLY. SILICON LABS DOES NOT WARRANT THAT THIS DESIGN WILL MEET THE SPECIFICATIONS, 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.



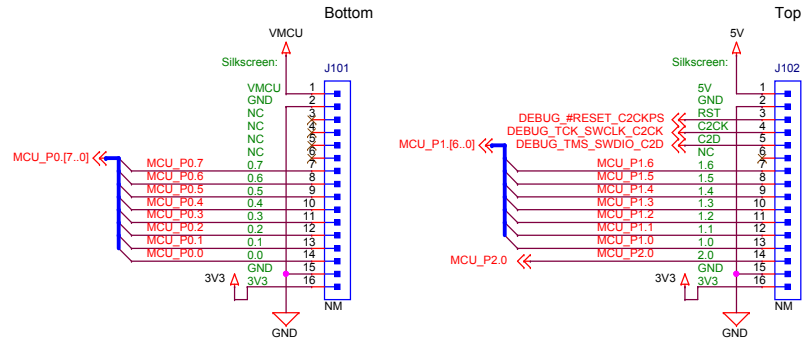
EFM8BB51 Pro Kit	
Board Function	Page
Title Page	1
User Interface	2
Signal Assignments	3
EFM8 Power & I/O	4
Target Voltage Supply	5
AEM	6
Debug Interface	7
Simplicity & VCOM	8
Power	9
Board Controller	10
Board Controller Misc	11

Revision History	
Rev.	Description
A00	Move to new Pro Kit platform.

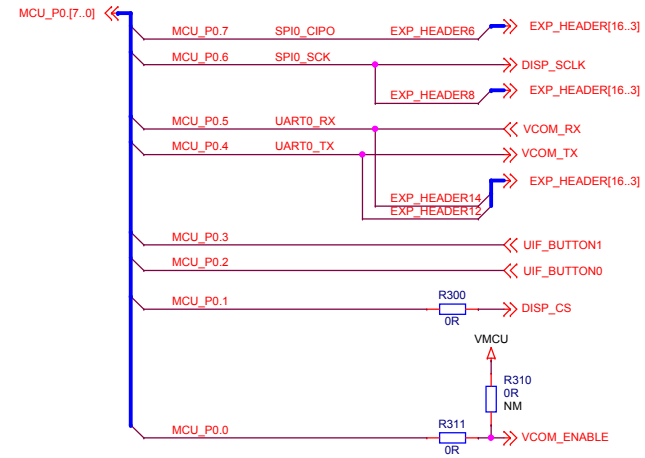
SILICON LABS	Board Name EFM8BB51 Pro Kit	
	Page Title Title Page	
Designed MAH	Approved RGU	Board Number BRD5207B
Size A3	Sheet Modified Date Monday, June 28, 2021	Revision A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE		Sheet 1 of 11



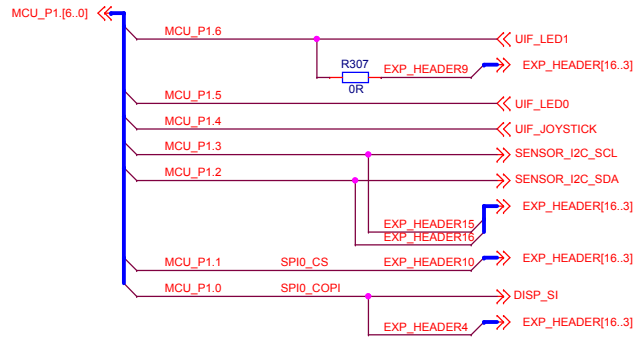
Breakout Connections



P0 Connections



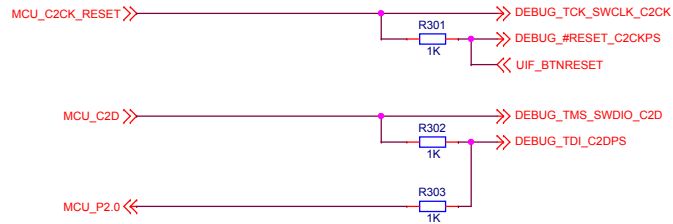
P1 Connections




P2 Connections

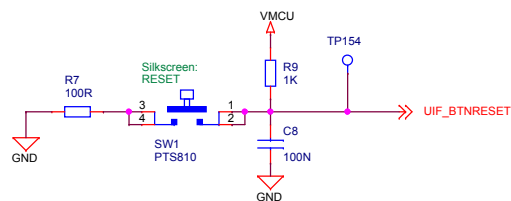


Debug Connections



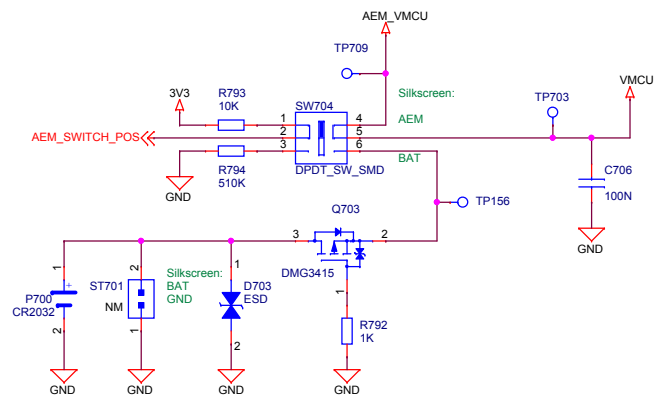
		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
Size A3		Signal Assignments	
Sheet Modified Date Monday, June 28, 2021		Board Number	Revision
		BRD5207B	A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 3 of 11

Reset Push Button

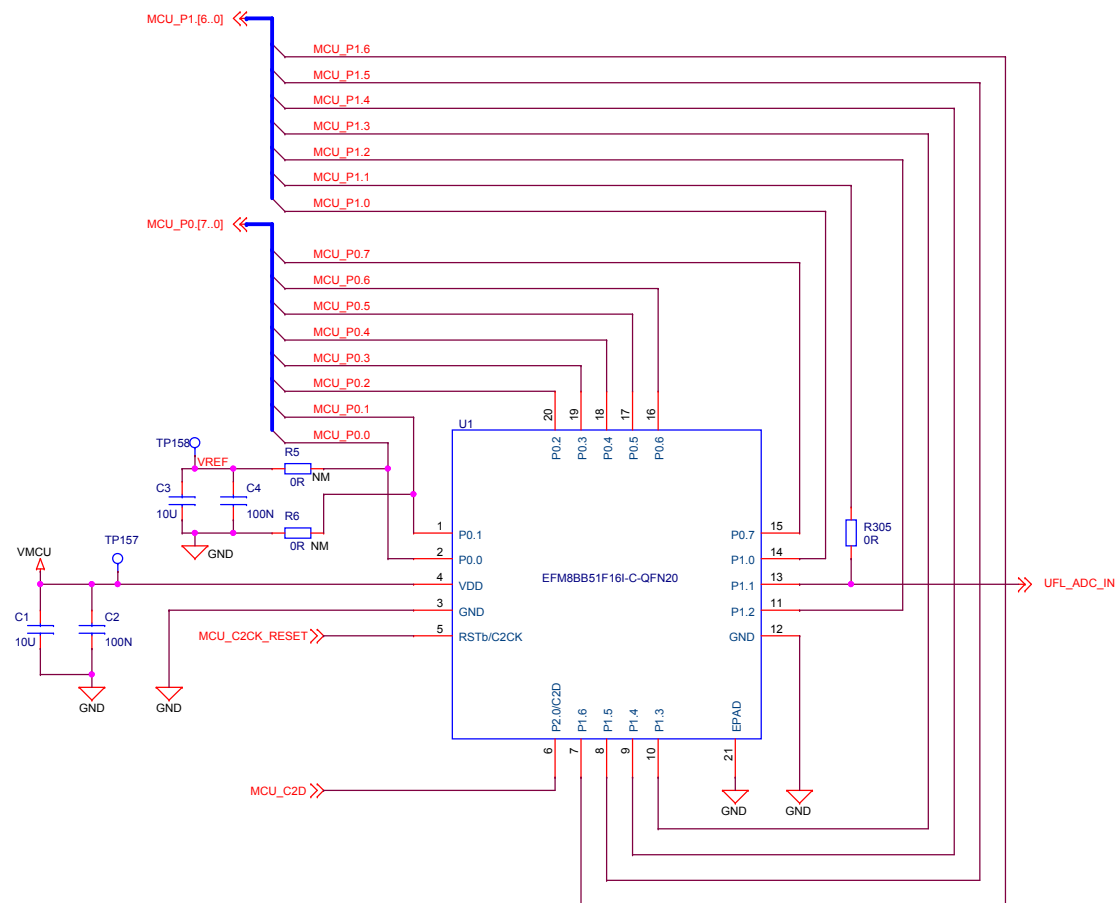



Power Select Switch: AEM/BAT

SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
BAT	AEM Disabled, VMCU sourced from coin-cell battery or external power supply

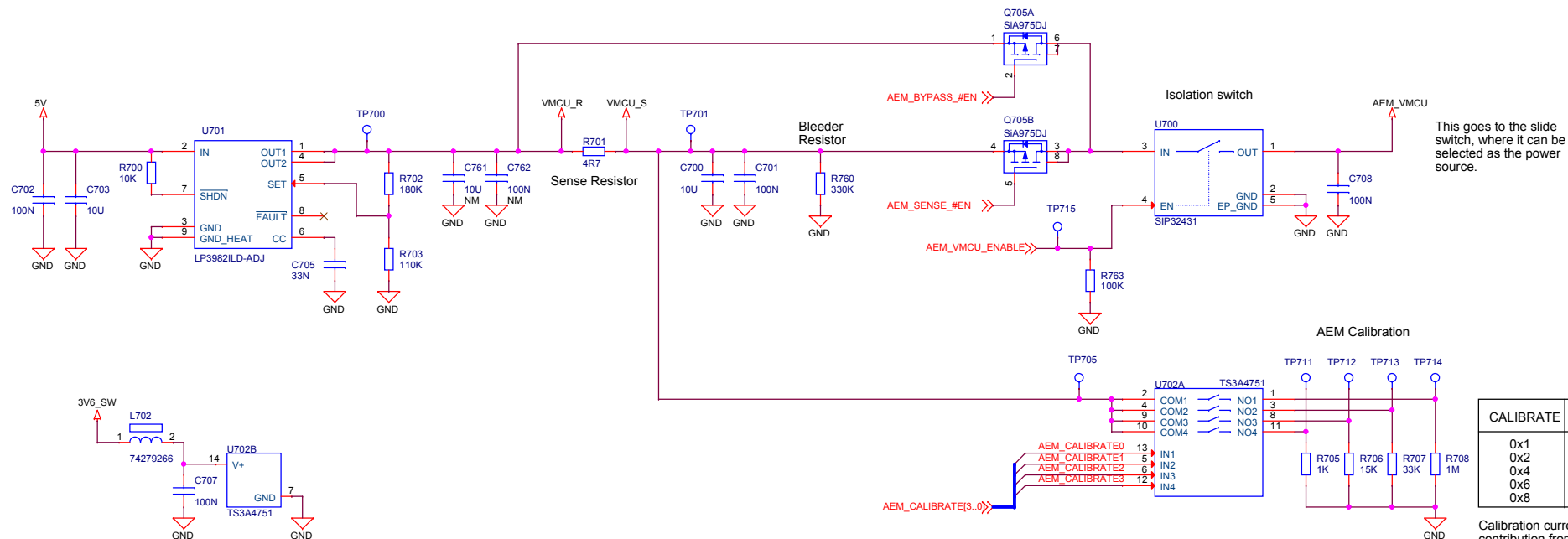


EFM8 I/O



		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
Size A3		EFM8 Power & I/O	
Sheet Modified Date Monday, June 28, 2021		Board Number	Revision
		BRD5207B	A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 4 of 11

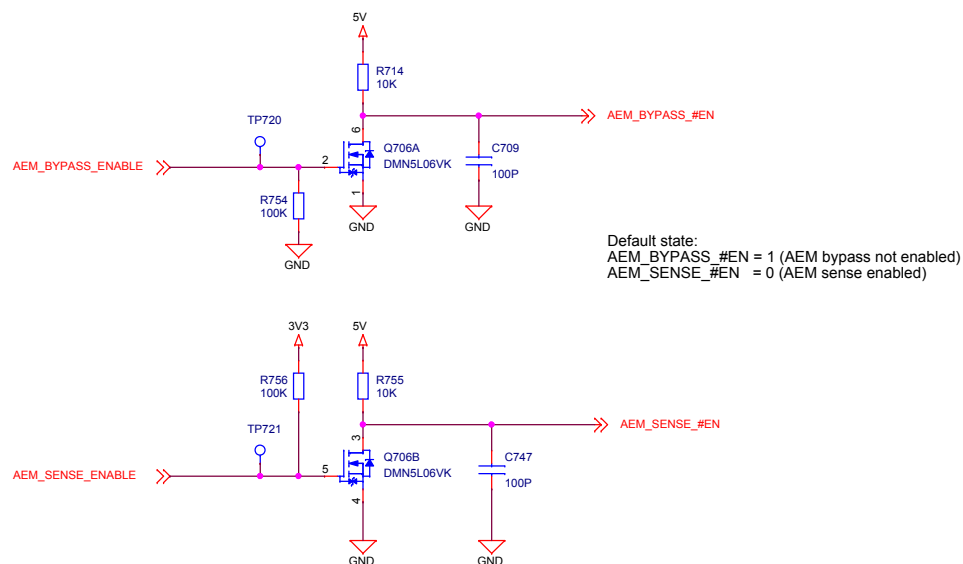
MCU Power Regulator




CALIBRATE	Calibration Current
0x1	13.30 uA
0x2	110 uA
0x4	230 uA
0x6	320 uA
0x8	3.30 mA

Calibration currents include contribution from sense and bleeder resistors.

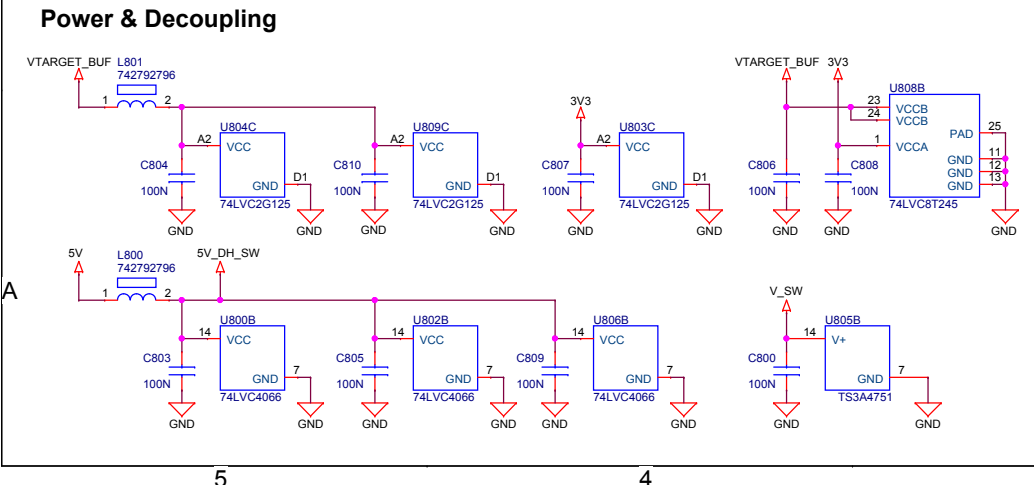
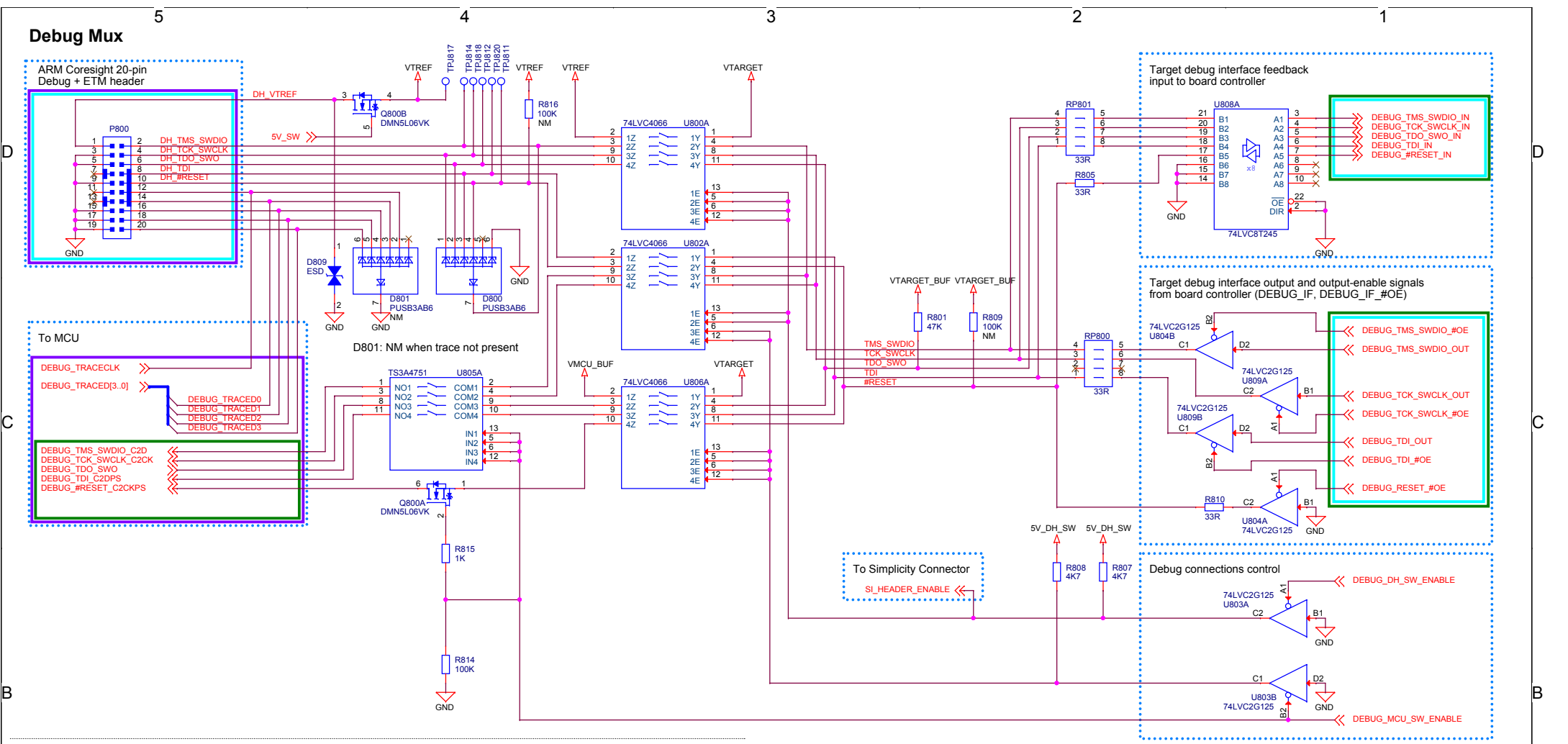
AEM Bypass Control



 SILICON LABS		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
Size A3		Target Voltage Supply	
Sheet Modified Date Monday, June 28, 2021		Board Number	Revision
		BRD5207B	A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 5 of 11


A





Mode	DEBUG_DH_SW_ENABLE	DEBUG_MCU_SW_ENABLE	DEBUG_IF_#OE	VTREF	VTARGET
Debug Out	1	0	0/1	External voltage	External voltage
MCU Debug	0	1	0/1	Disconnected	VMCU
Debug In	1	1	1	VMCU	VMCU
Debug Off	0	0	1	-	-

Color coded frames indicates which groups of signal nodes that are active in a given debug mode



SILICON LABS

Designed MAH Approved RGU

Size A3 Sheet Modified Date Monday, June 28, 2021

Board Name
EFM8BB51 Pro Kit

Page Title
Debug Interface

Board Number
BRD5207B

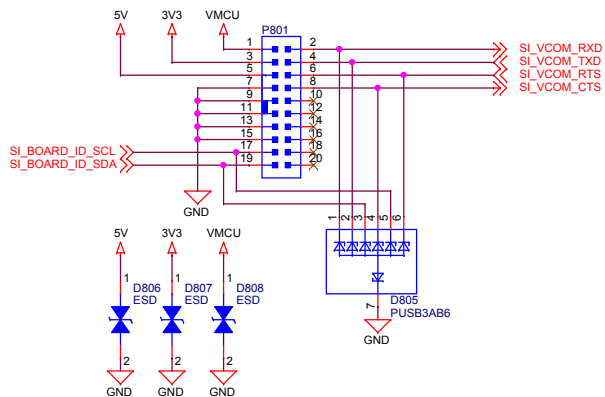
Revision
A01

COPYRIGHT SILICON LABORATORIES INC. 2021

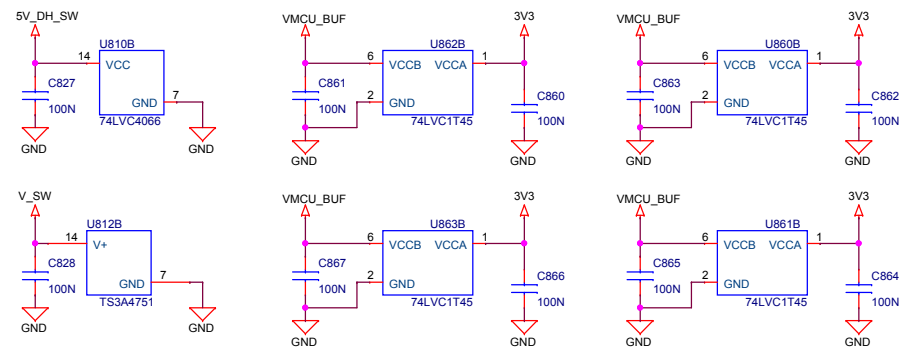
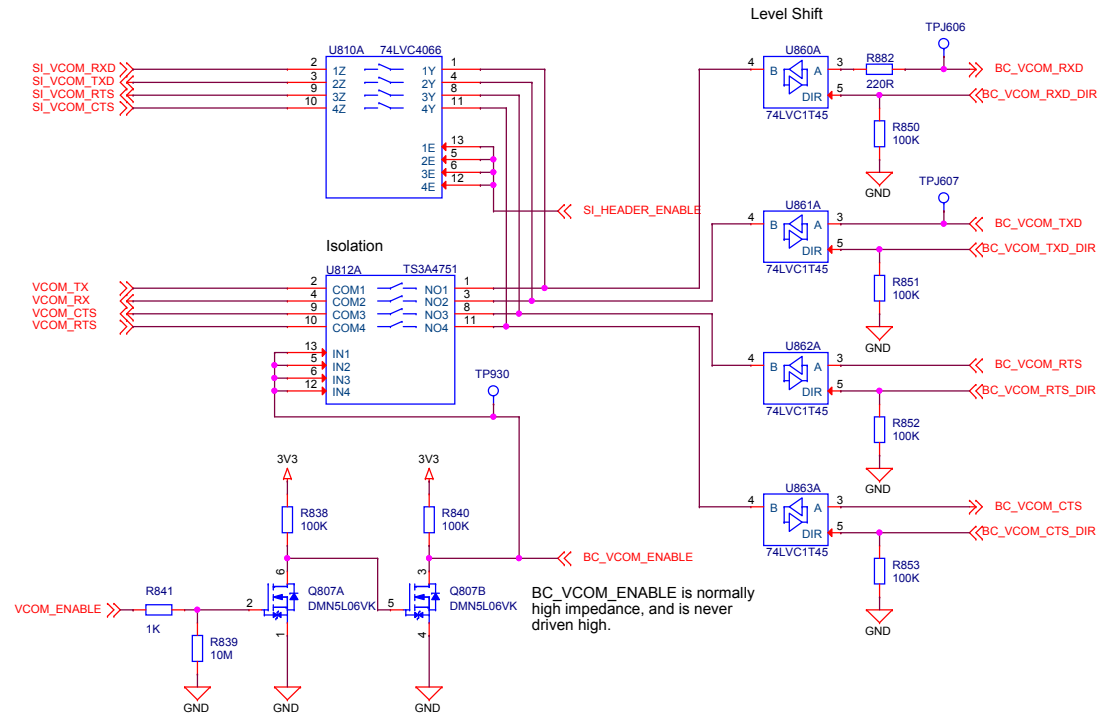
CONFIDENTIAL – SUBJECT TO TERMS OF USE


Sheet 7 of 11

Simplicity Connector



VCOM Interface



		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
Size A3		Simplicity & VCOM	
Sheet Modified Date Monday, June 28, 2021		Board Number	Revision
		BRD5207B	A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE			
Sheet 8 of 11			

The schematic diagram illustrates the Board Controller, featuring three microcontroller units (U900A, U900B, and U900C) and their connections to various peripheral components.

U900A (Left): Connected to a 48 MHz crystal (X900) and a 10MHz reference clock input (TPJ960). It manages various control signals like `DEBUG_TMS_SWIDIO_OUT`, `BC_VCOM_RTS`, `BC_VCOM_CTS`, `BC_VCOM_TXD`, `BC_VCOM_RXD`, `BC_VCOM_RTS_DIR`, `BC_VCOM_CTS_DIR`, `BOARD_ID_SDA`, `BOARD_ID_SCL`, `AEM_BYPASS_ENABLE`, `BOARD_ID_WP`, `AEM_SENSE_ENABLE`, `LED_STATUS_R`, `BC_DISP_PWR_ENABLE`, `LED_STATUS_G`, `BC_DISP_CS`, `BC_DISP_SCLK`, `AEM_5V_ENABLE`, `AEM_SWITCH_POS`, `AEM_CURRENT_HIGH_GAIN`, `BC_ADC_VREF`, `AEM_SENSE_SELECT`, `AEM_VMCU_ENABLE`, `BC_ADC_SPI_COPI`, `BC_ADC_SPI_CPO`, `BC_ADC_SPI_SCLK`, `BC_ADC_SPI_CS`, `BC_I2C_EXP_ENABLE`, `BC_BUTTON_ENABLE`, `BC_VCOM_RXD_DIR`, `BC_VCOM_TXD_DIR`, `AEM_CURRENT_LOW_GAIN`, and `BC_DAC_OUT`.

U900B (Middle): Manages various control signals like `PC0 / USART2_RTS #0`, `PC1 / USART2_CTS #0`, `PC2 / USART2_TX #0`, `PC3 / USART2_RX #0`, `PC4`, `PC5`, `PC6 / I2C0_SDA #2`, `PC7 / I2C0_SCL #2`, `F12`, `F13`, `E12`, `PC9`, `PC10`, `PC11`, `PC12`, `PC13`, `PC14 / USART1_CS #3`, `PC15 / USART1_CLK #3`, `PD0`, `PD1`, `PD2 / ADC0_CH2`, `PD3 / ADC0_CH3`, `PD4`, `PD5 / ADC0_CH5`, `PD6 / ADC_EXTTP`, `PD7`, `PD8`, `PD9 / USART4_TX #1`, `BC_ADC_SPI_RX #1`, `PD11 / USART4_CLK #1`, `PD12 / USART4_CS #1`, `PD13 / ETM_TD1 #1`, `PD14`, and `PD15`.

U900C (Right): Manages various control signals like `AEM_CALIBRATE0`, `AEM_CALIBRATE1`, `AEM_CALIBRATE2`, `AEM_CALIBRATE3`, `TEST_USB_ADDR0`, `TEST_USB_ADDR1`, `BC_DISP_COM`, `TEST_USB_ADDR2`, `BC_UIF_BUTTON0`, `BC_UIF_BUTTON1`, `BC_SPI_COPI`, `BC_SPI_CPO`, `BC_SPI_SCLK`, `BC_SPI_CS`, `TEST_BC_TXD`, `TEST_BC_RXD`, `TPJ954`, `TPJ953`, `TPJ955`, `TPJ961`, `TPJ908`, `TPJ909`, `TPJ957`, `TPJ958`, `BC_DBG_TCK_SWCLK`, `BC_DBG_TMS_SWIDIO`, `BC_DBG_TDO_SWO`, `BC_TRACECLK`, `BC_TRACE0`, `R902 33R`, `R904 33R`, `PF0 / DBG_SWCLK`, `PF1 / DBG_SWIDIO`, `PF2 / DBG_SWO #0`, `PF3 / ETM_TD3 #1`, `PF4`, `PF5`, `PF6 / USART1_TX #3`, `PF7 / TIM0_CC1 #1`, `PF8 / ETM_TCLK #1`, `PF9 / ETM_TDO #1`, `PF10 / USB_DM`, `PF11 / USB_DP`, and `PF12`.


The diagram also shows connections to a 3V3 power supply (TPJ950) and a 10MHz reference clock input (TPJ912, TPJ913).

[illegible]

Board ID & Button Isolation

BC Serial Flash

Board Version



SILICON LABS

Designed MAH	Approved RGU
Size A3	Sheet Modified Date Monday, June 28, 2021

Board Name EFM8BB51 Pro Kit	
Page Title Board Controller	
Board Number BRD5207B	Revision A01

COPYRIGHT SILICON LABORATORIES INC. 2021	CONFIDENTIAL – SUBJECT TO TERMS OF USE
--	--

Sheet 10 of 11

BC Serial Flash

The schematic diagram illustrates the BC Serial Flash circuit. It features two MX25R8035F flash memory chips, U902A and U902B. U902A is connected to BC_SPI_COP1, BC_SPI_SCLK, BC_SPI_CS, and BC_SPI_CPO. U902B is connected to BOARD_VER0, BOARD_VER1, and GND. The diagram includes 3V3 power supply, pull-up resistors R906, R931, and R930, and a capacitor C914.

Board Version

The Board Version section shows the connection of BOARD_VER0 and BOARD_VER1 to GND through resistors R931 and R930.

Name	
M8BB51 Pro Kit	
Title	
Part Number	Revision
D5207B	A01
INC. 2021	Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE	10 of 11

BC Serial Flash

The schematic diagram illustrates the BC Serial Flash circuit. It features two MX25R8035F flash memory chips, U902A and U902B. U902A is connected to BC_SPI_COP1, BC_SPI_SCLK, BC_SPI_CS, and BC_SPI_CPO. U902B is connected to BOARD_VER0, BOARD_VER1, and GND. The diagram includes 3V3 power supply, pull-up resistors R906, R931, and R930, and a capacitor C914.

Board Version

The Board Version section shows the connection of BOARD_VER0 and BOARD_VER1 to GND through resistors R931 and R930.

Name	
M8BB51 Pro Kit	
Title	
Board Controller	
Part Number	Revision
D5207B	A01
INC. 2021	Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE	10 of 11



Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

Board Name		A
EFM8BB51 Pro Kit		
Page Title		
Board Controller		
Board Number		Revision
BRD5207B		A01
LABORATORIES INC. 2021		Sheet
CONFIDENTIAL – SUBJECT TO TERMS OF USE		10 of 11

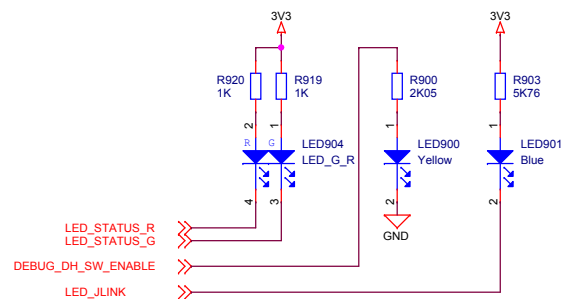
Revision	
A01	
Sheet	
10 of 11	

Revision	
A01	
Sheet	
10 of 11	

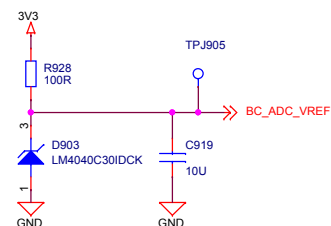
Revision	
A01	
Sheet	
10 of 11	

 SILICON LABS		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
		Board Controller	
Size A3	Sheet Modified Date Monday, June 28, 2021	Board Number BRD5207B	Revision A01
COPYRIGHT SILICON LABORATORIES INC. 2021		CONFIDENTIAL – SUBJECT TO TERMS OF USE	
		Sheet 10 of 11	

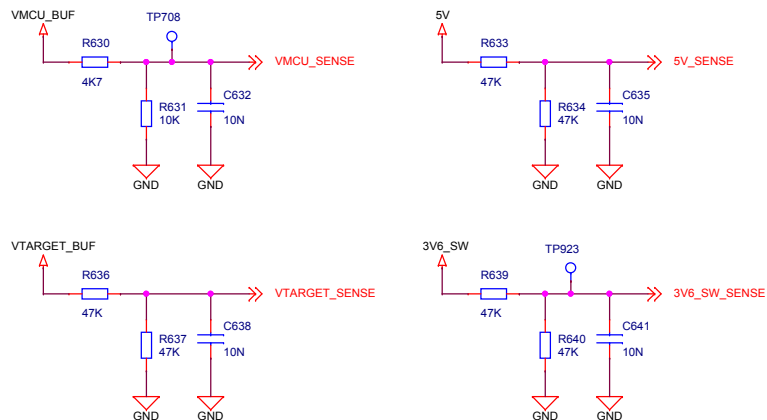
Indicator LEDs



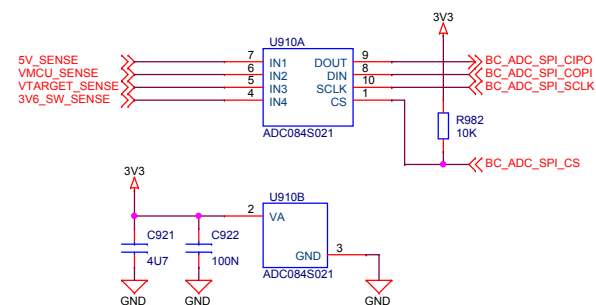
BC ADC Reference



BC Voltage Sense



BC Voltage Sense ADC



 SILICON LABS		Board Name	
		EFM8BB51 Pro Kit	
Designed MAH		Page Title	
Size A3		Board Controller Misc	
Sheet Modified Date Monday, June 28, 2021		Board Number	Revision
		BRD5207B	A01
COPYRIGHT SILICON LABORATORIES INC. 2021 CONFIDENTIAL – SUBJECT TO TERMS OF USE			Sheet 11 of 11