



## EFM8LB1 LaserBee STK

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## Revision History

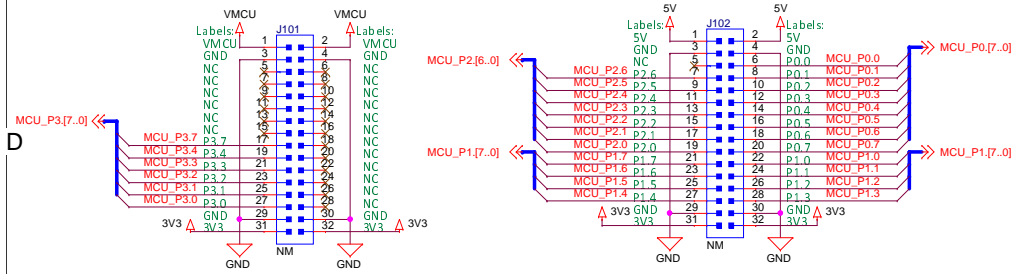
Rev.	Description
A00	Initial release.
A01	Changed to surface mounted joystick and smaller reset switch.
A02	Cleaned up sine generator circuit. Updated silk print.



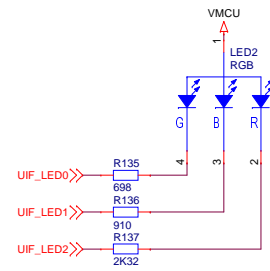
STK

<p><b>SILICON LABS</b></p>		Schematic Title	
		<b>EFM8 Laser Bee Starter Kit</b>	
Designed: MRW		Approved: JNO	
Page Title		<b>Title Page</b>	
Size: A3	BOM Doc No:	Document number	Revision
		<b>BRD5300A</b>	A02
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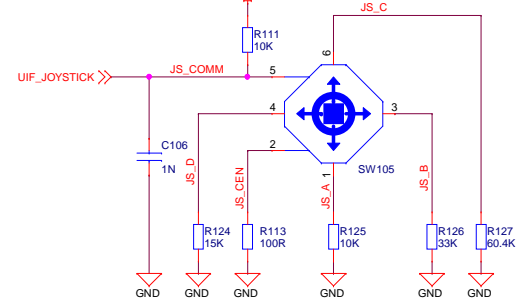
### 5 Breakout Connections



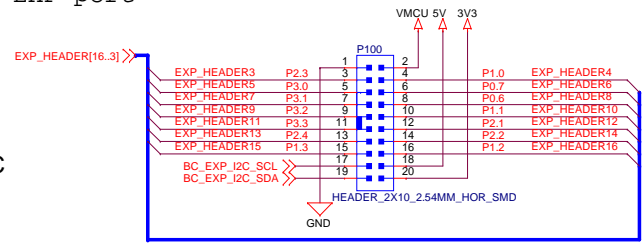
### 3 RGB LED



### 2 Analog Joystick



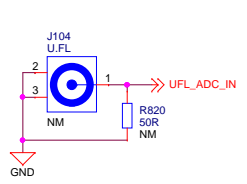
### EXP port



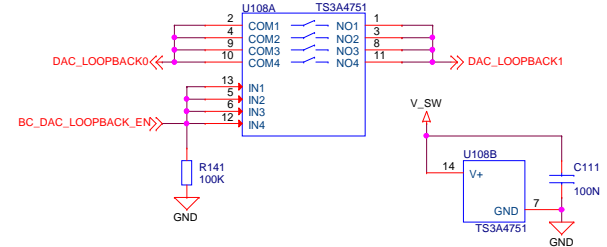
### EXP-Header Functionality

1	GND		
3	P2.3		CMP1.5/ADC0.16
5	P3.0		DAC0
7	P3.1		DAC1
9	P3.2		DAC2
11	P3.3		DAC3
13	P2.4		CMP1.6/ADC0.17
15	P1.3		I2C0_SCL
17	P2.4		CMP1.6/ADC0.9
19			Reserved for EXP Board Identification
2	VMCU		
4	P1.0		SPI0_MOSI
6	P0.7		SPI0_MISO
8	P0.6		SPI0_SCK
10	P1.1		SPI0_NSS
12	P2.1		UART1_TX
14	P2.2		UART1_RX
16	P1.2		I2C0_SDA
18	5V		
20	3V3		

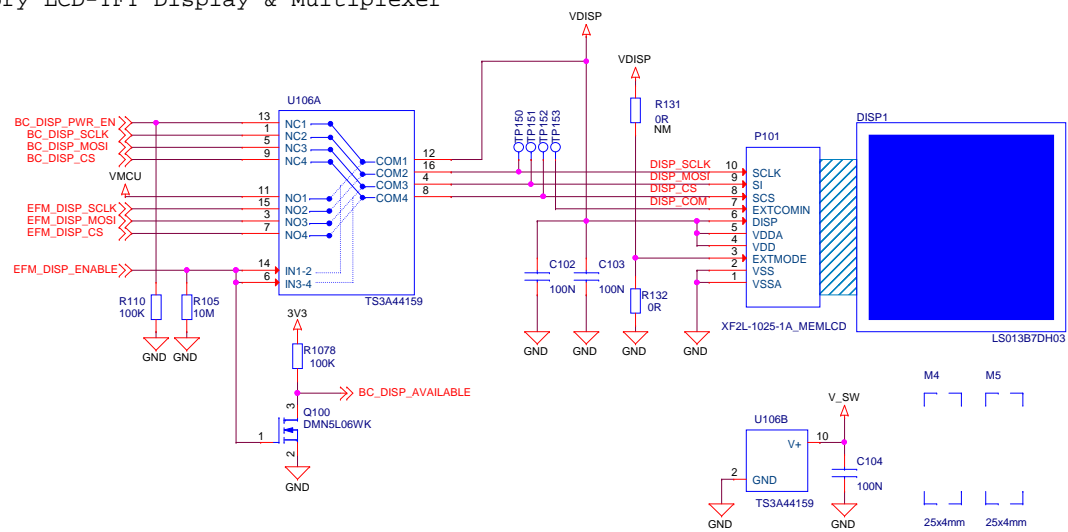
### U.FL ADC Connection



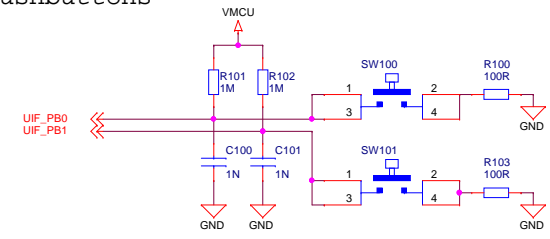
### DAC Loopback Analog Switch



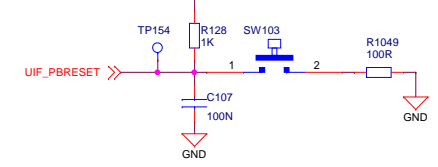
### Memory LCD-TFT Display & Multiplexer



### User pushbuttons



### RESET Pushbutton

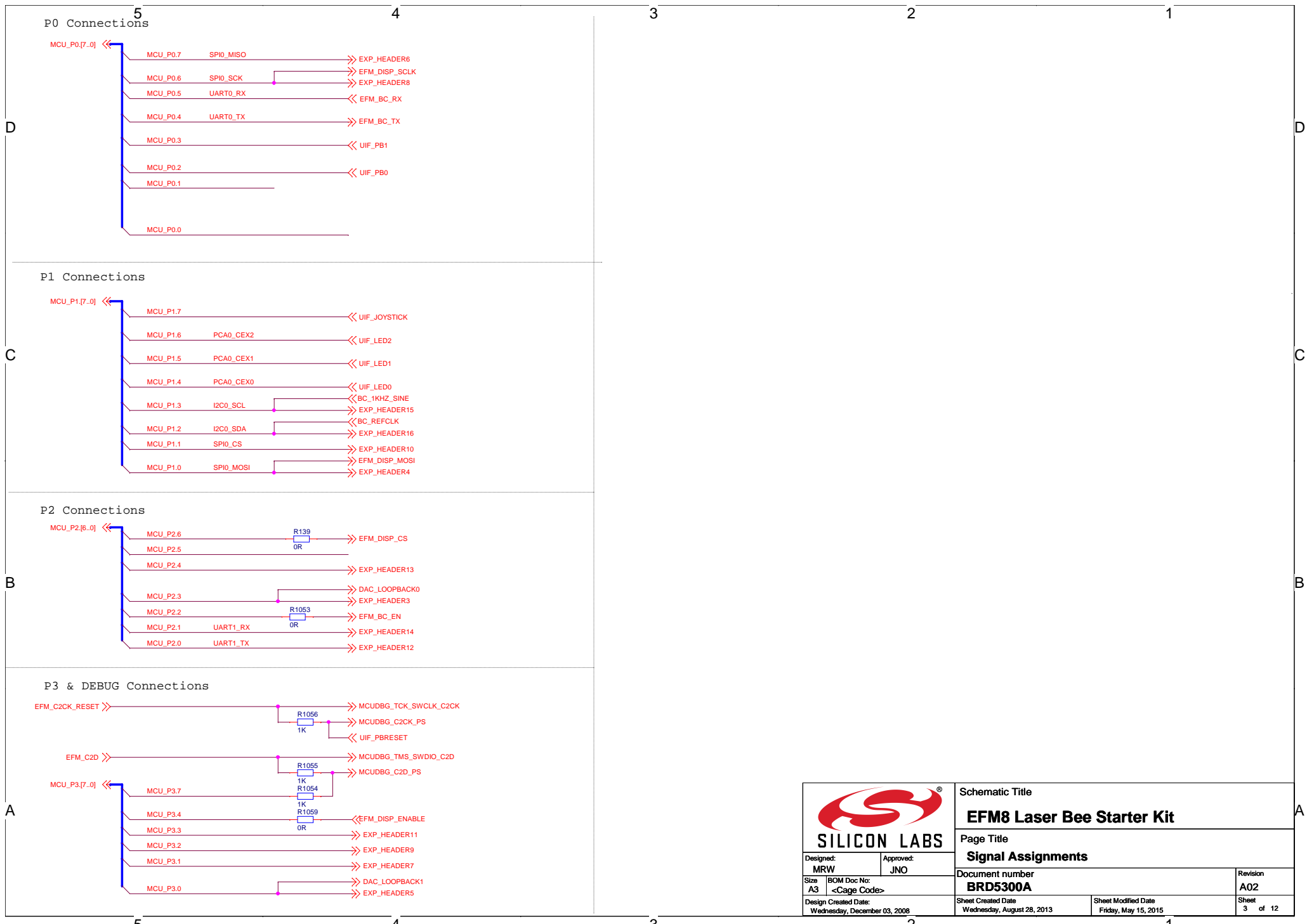



### STK

		Schematic Title	
		<b>EFM8 Laser Bee Starter Kit</b>	
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		<b>User Interfaces</b>	
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The EFM8 always controls ownership of the display using the EFM\_DISP\_ENABLE signal.

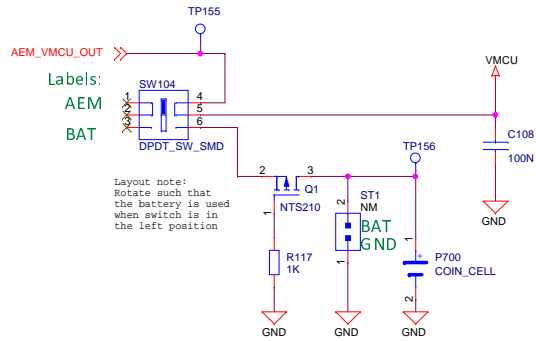
EFM_DISP_ENABLE	DISP_CTRL	VDISP
0	BC	BC_DISP_PWR_EN
1	EFM	VMCU



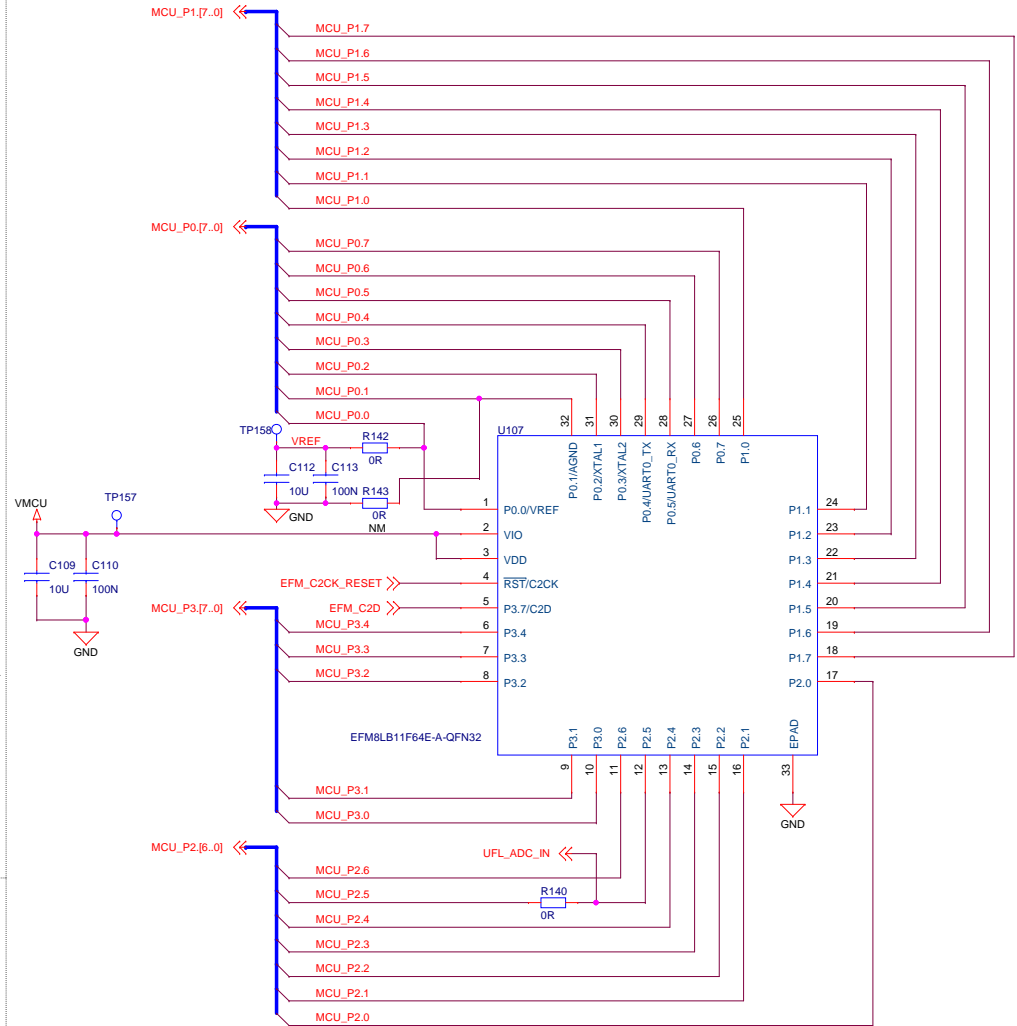
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		<b>EFM8 Laser Bee Starter Kit</b>	
Designed: MRW Approved: JNO		Page Title	
		<b>Signal Assignments</b>	
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Power Switch

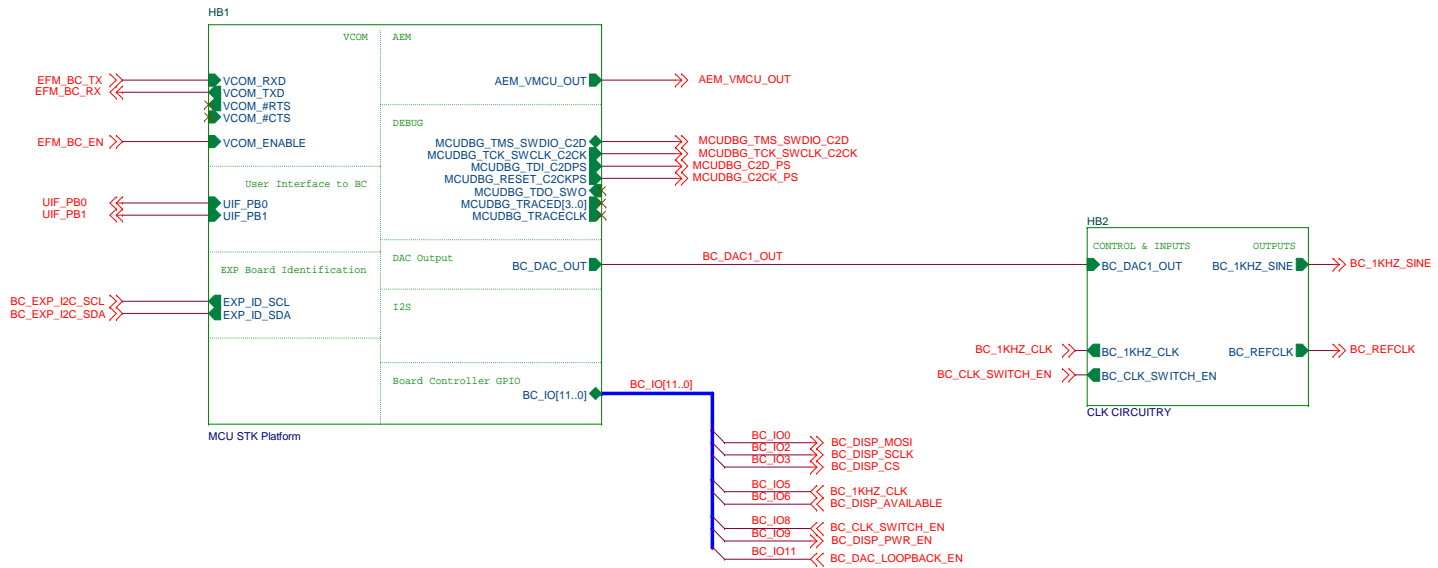
SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
BAT	AEM Disabled, VMCU sourced from external coin-cell battery or external power supply




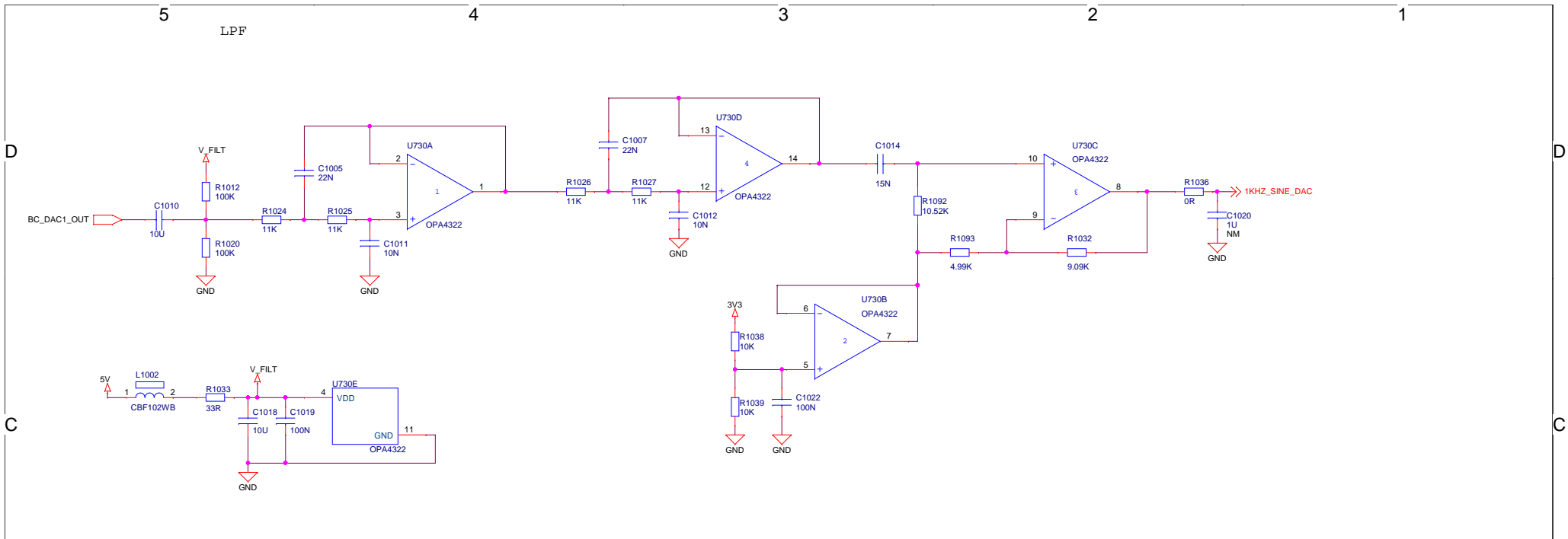
C2 Debug Header



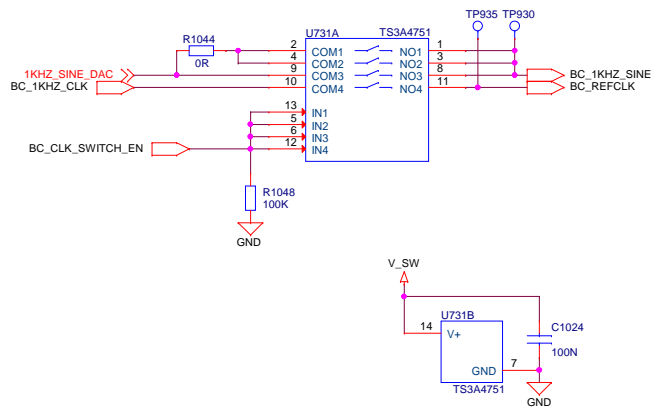
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Designed: MRW Approved: JNO		Page Title	
		<b>EFM8 I/O</b>	
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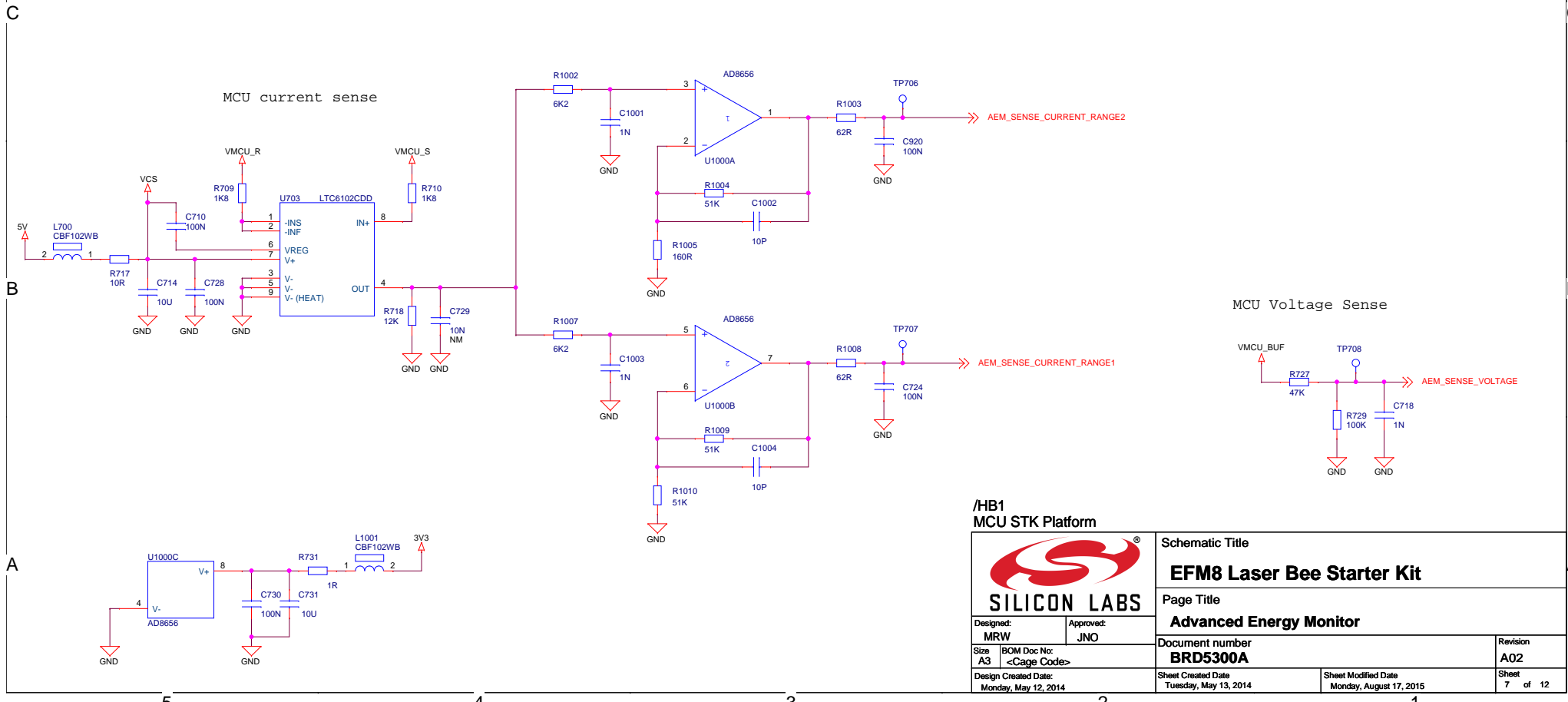
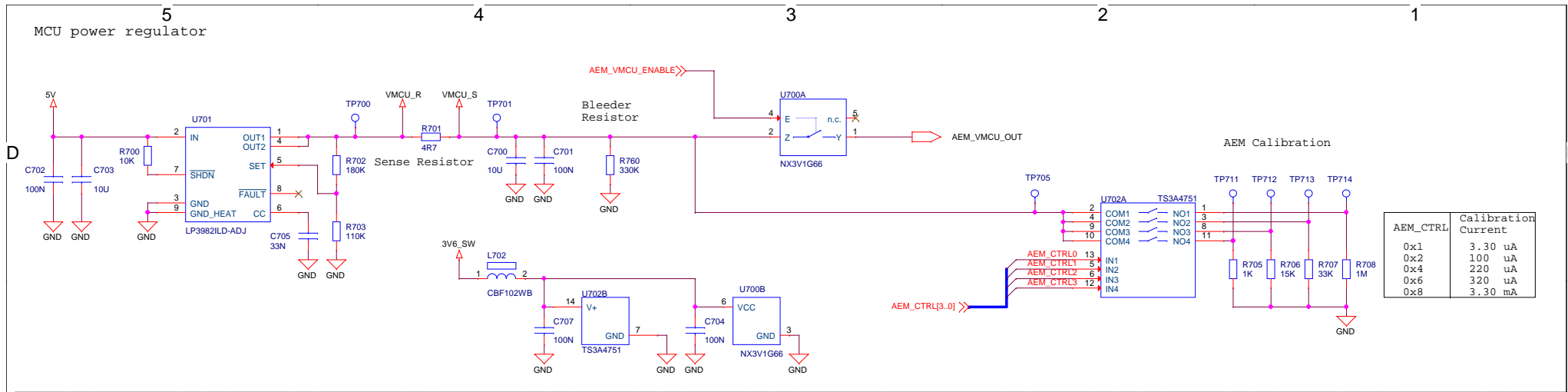
 <b>SILICON LABS</b>		Schematic Title	
		<b>EFM8 Laser Bee Starter Kit</b>	
Designed: MRW Approved: JNO		Page Title	
		<b>Functional Blocks</b>	
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Analog Switch



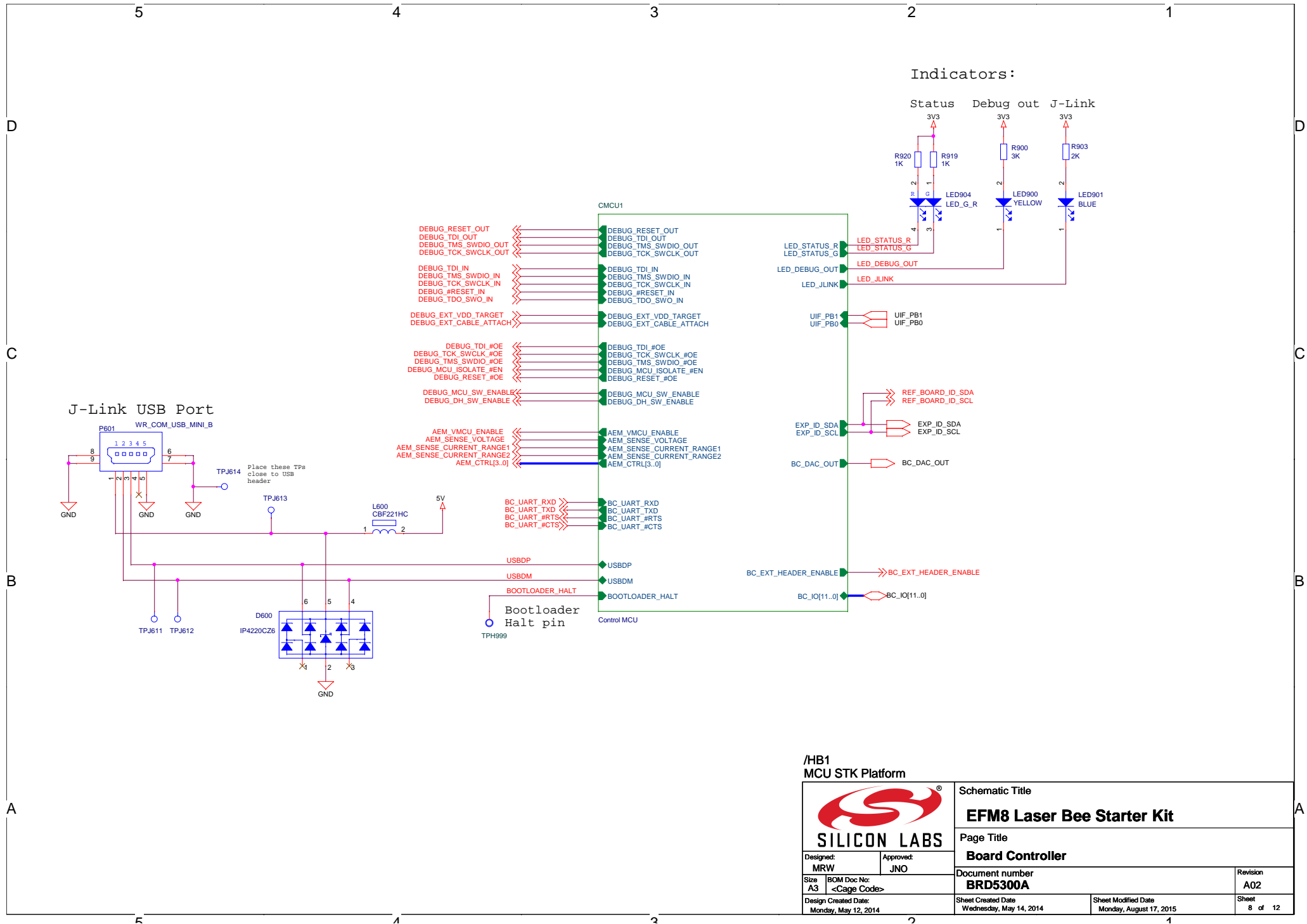
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		<b>EFM8 Laser Bee Starter Kit</b>	
Designed: MRW Approved: JNO		Page Title	
		<b>Functional Blocks</b>	
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**/HB1  
MCU STK Platform**

**SILICON LABS**

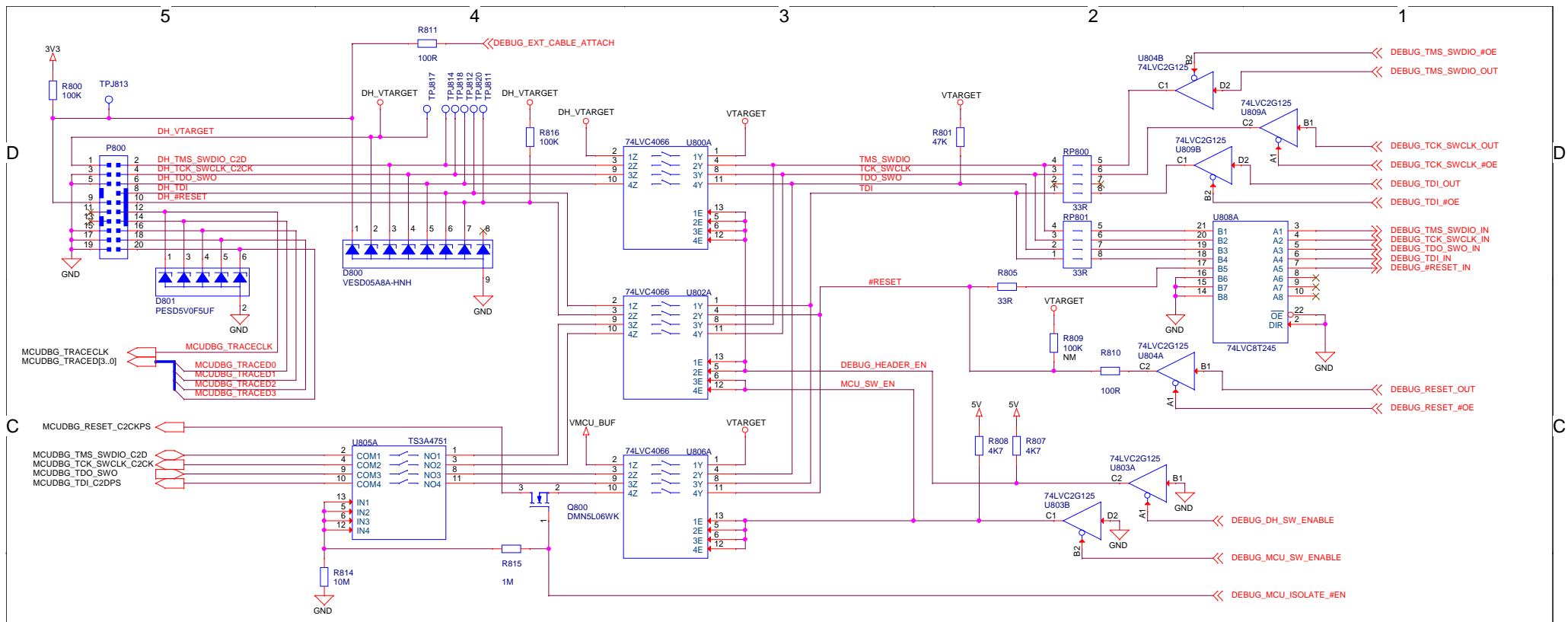
Schematic Title		<b>EFM8 Laser Bee Starter Kit</b>	
Page Title		<b>Advanced Energy Monitor</b>	
Designed: <b>MRW</b>	Approved: <b>JNO</b>	Document number	Revision
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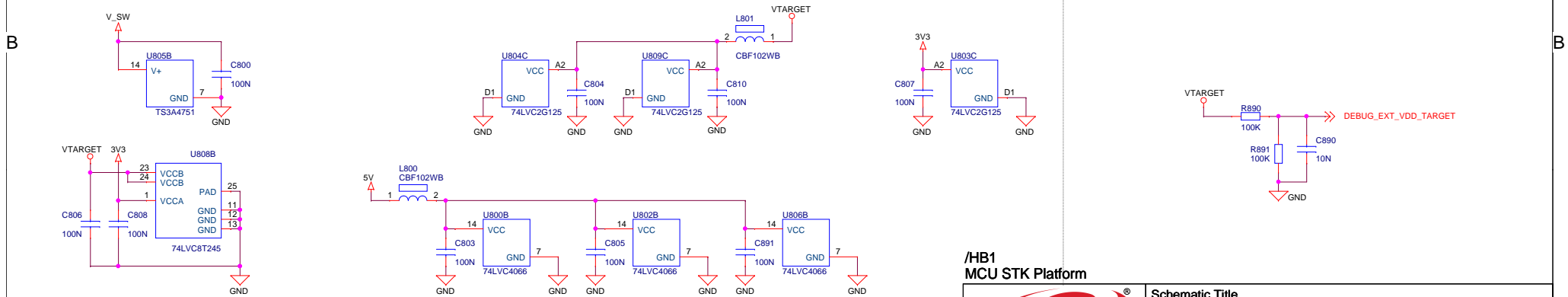
/HB1  
MCU STK Platform

 <b>SILICON LABS</b>		Schematic Title	
		<b>EFM8 Laser Bee Starter Kit</b>	
Designed: MRW Approved: JNO		Page Title	
		<b>Board Controller</b>	
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Power & Decoupling



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	1	1	1	0	-	-

/HB1  
MCU STK Platform

**Schematic Title**  
**EFM8 Laser Bee Starter Kit**

**Page Title**  
**Debug Interface**

**Document number**  
**BRD5300A**

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**A02**

**Designed:** MRW

**Approved:** JNO

**Size:** A3

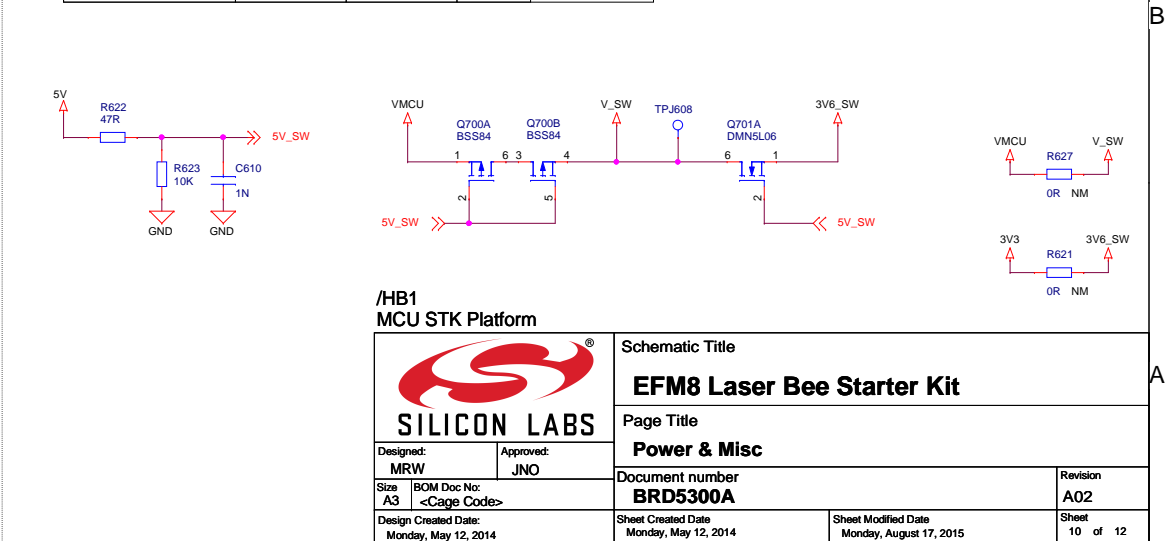
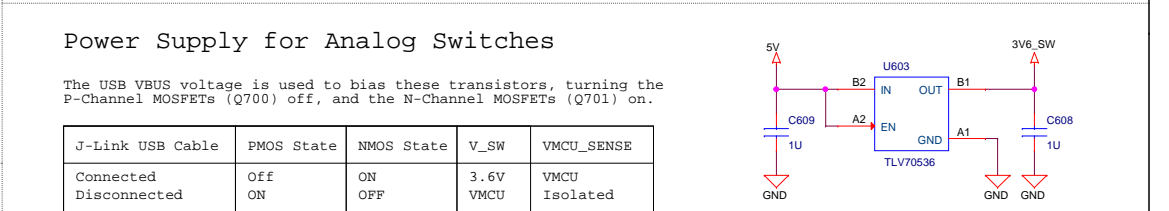
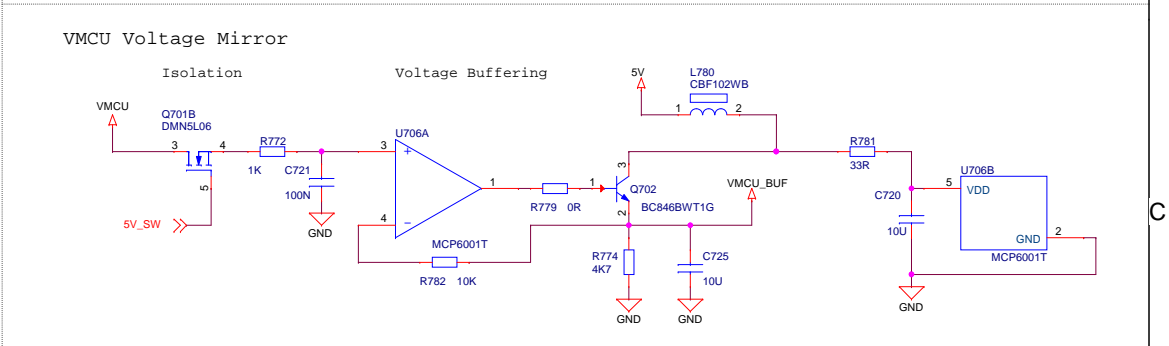
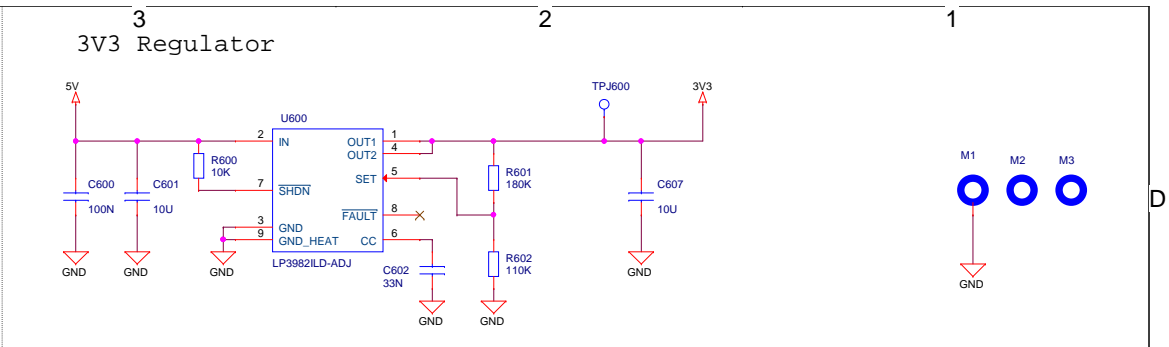
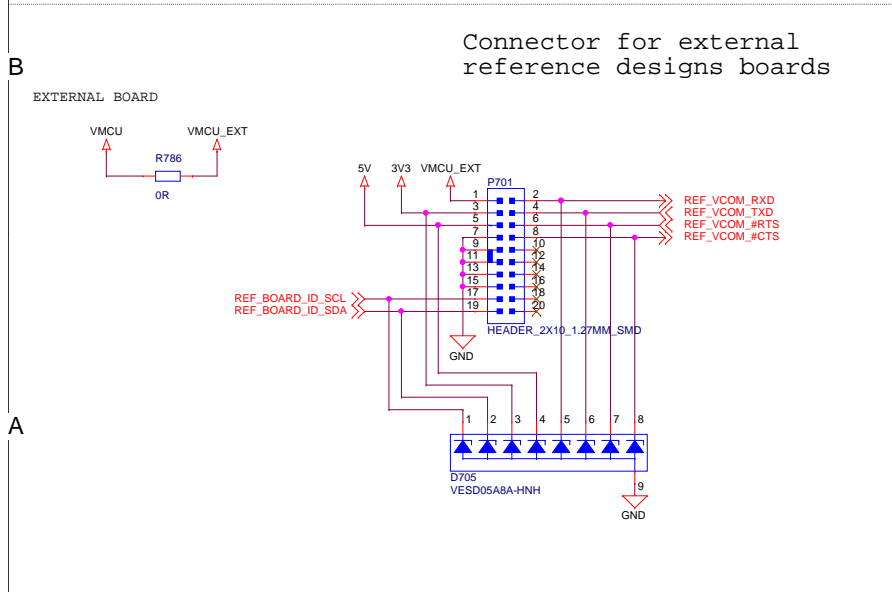
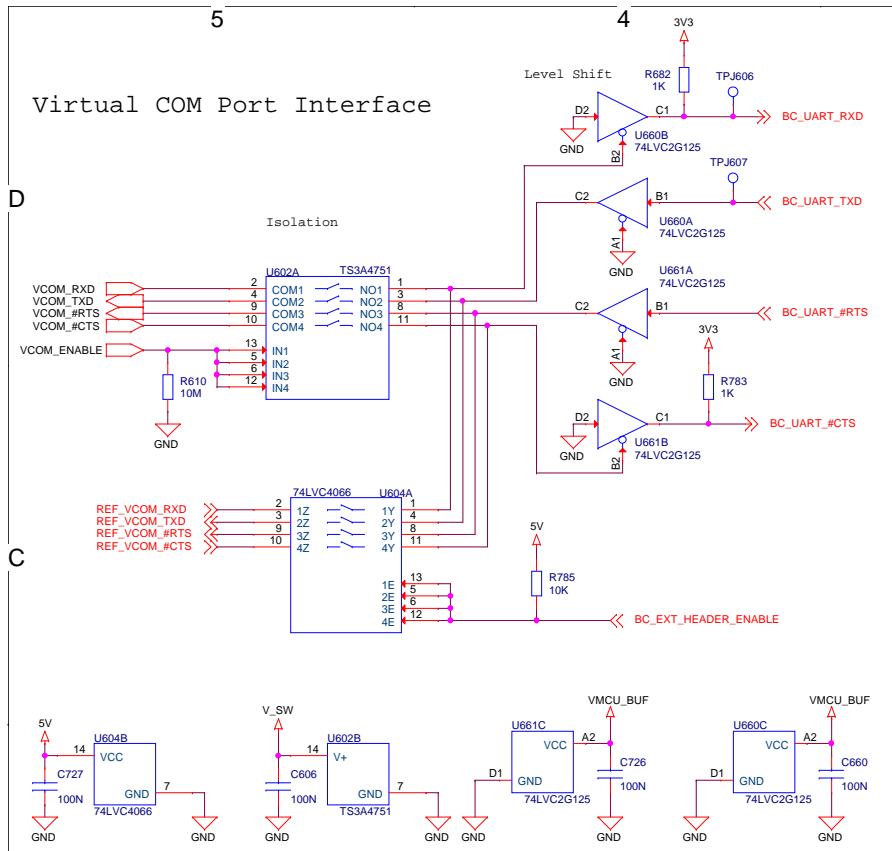
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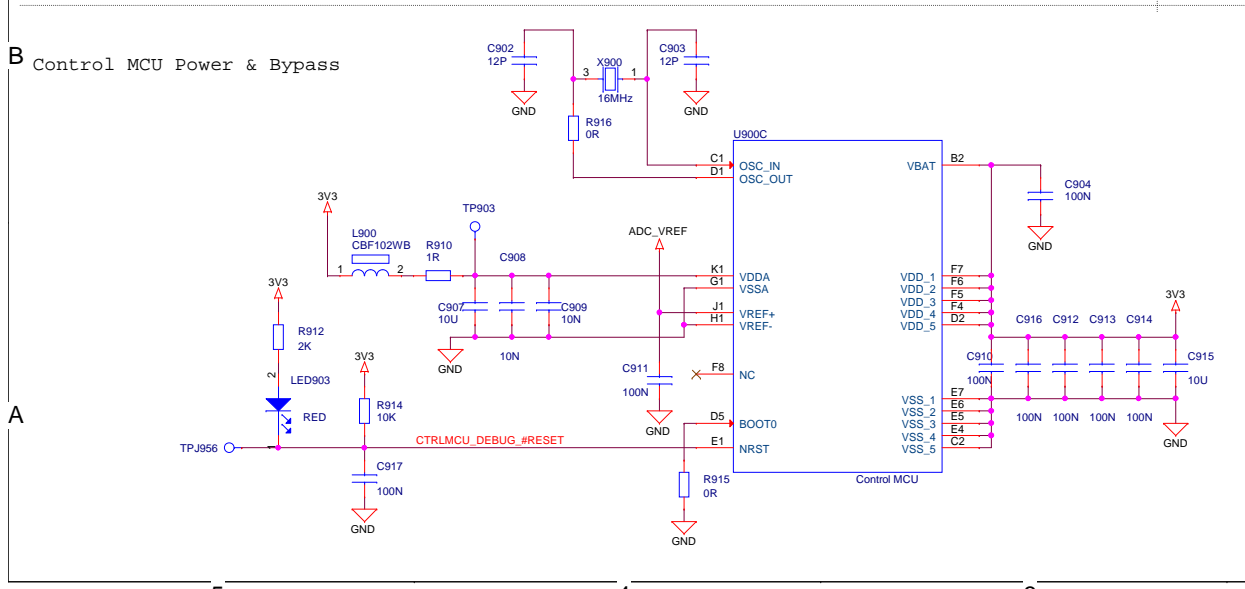
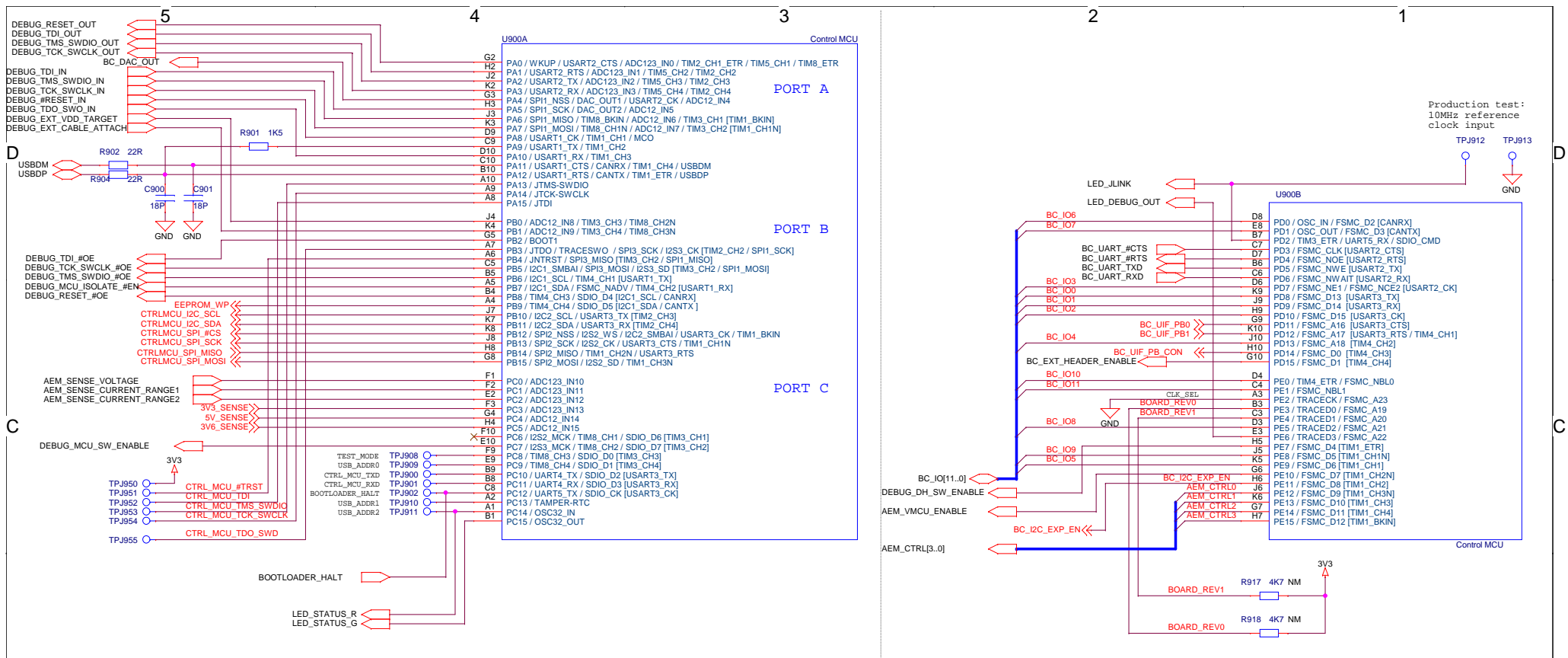
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/HB1  
MCU STK Platform

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Page Title		<b>Power &amp; Misc</b>	
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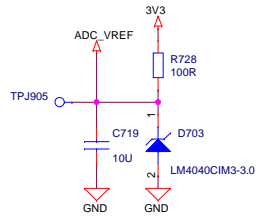
**Control MCU (U900B) Connections:**

- LEDs:** LED\_ILINK, LED\_DEBUG\_OUT, TPJ912, TPJ913.
- BC Pins:** BC\_IO6, BC\_IO7, BC\_IO3, BC\_IO0, BC\_IO1, BC\_IO2, BC\_IO4, BC\_IO10, BC\_IO11, BC\_IO8, BC\_IO9, BC\_IO5.
- Other:** BC\_IQ[1..0], DEBUG\_DH\_SW\_ENABLE, AEM\_VMCU\_ENABLE, AEM\_CTRL[3..0], BC\_I2C\_EXP\_EN, CLK\_SEL, BOARD\_REV0, BOARD\_REV1, BOARD\_REV2, AEM\_CTRL0, AEM\_CTRL1, AEM\_CTRL2, AEM\_CTRL3.
- Control MCU (U900B) Pins:** PD0/OSC\_IN/FSMC\_D2[CANRX], PD1/OSC\_OUT/FSMC\_D3[CANTX], PD2/TIM3\_ETR/UART5\_RX/SDIO\_CMD, PD3/FSMC\_CLK[USART2\_CTS], PD4/FSMC\_NOE[USART2\_RTS], PD5/FSMC\_NWE[USART2\_TX], PD6/FSMC\_NWAIT[USART2\_RX], PD7/FSMC\_NE1/FSMC\_NCE2[USART2\_CK], PD8/FSMC\_D13[USART3\_TX], PD9/FSMC\_D14[USART3\_RX], PD10/FSMC\_D15[USART3\_TX], PD11/FSMC\_A16[USART3\_CTS], PD12/FSMC\_A17[USART3\_RTS/TIM4\_CH1], PD13/FSMC\_A18[TIM4\_CH2], PD14/FSMC\_D0[TIM4\_CH3], PD15/FSMC\_D1[TIM4\_CH4], PE0/TIM4\_ETR/FSMC\_NBL0, PE1/FSMC\_NBL1, PE2/TRACECK/FSMC\_A23, PE3/TRACED0/FSMC\_A19, PE4/TRACED1/FSMC\_A20, PE5/TRACED2/FSMC\_A21, PE6/TRACED3/FSMC\_A22, PE7/FSMC\_D4[TIM1\_ETR], PE8/FSMC\_D5[TIM1\_CH1N], PE9/FSMC\_D6[TIM1\_CH1], PE10/FSMC\_D7[TIM1\_CH2N], PE11/FSMC\_D8[TIM1\_CH2], PE12/FSMC\_D9[TIM1\_CH3N], PE13/FSMC\_D10[TIM1\_CH3], PE14/FSMC\_D11[TIM1\_CH4], PE15/FSMC\_D12[TIM1\_BKIN].

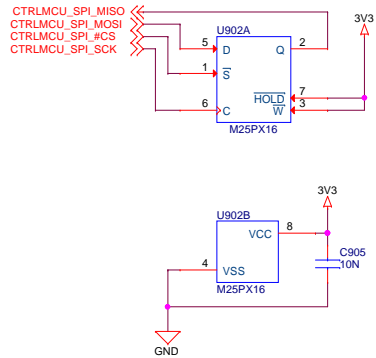
**Power & Bypass:** BOARD\_REV1, BOARD\_REV0, R917 (4K7 NM), R918 (4K7 NM), 3V3.

<b>/HB1/CMCU1 Control MCU</b>		<b>Schematic Title</b>	
		<b>EFM8 Laser Bee Starter Kit</b>	
<b>Designed:</b> MRW		<b>Page Title</b>	
<b>Approved:</b> JNO		<b>Control MCU</b>	
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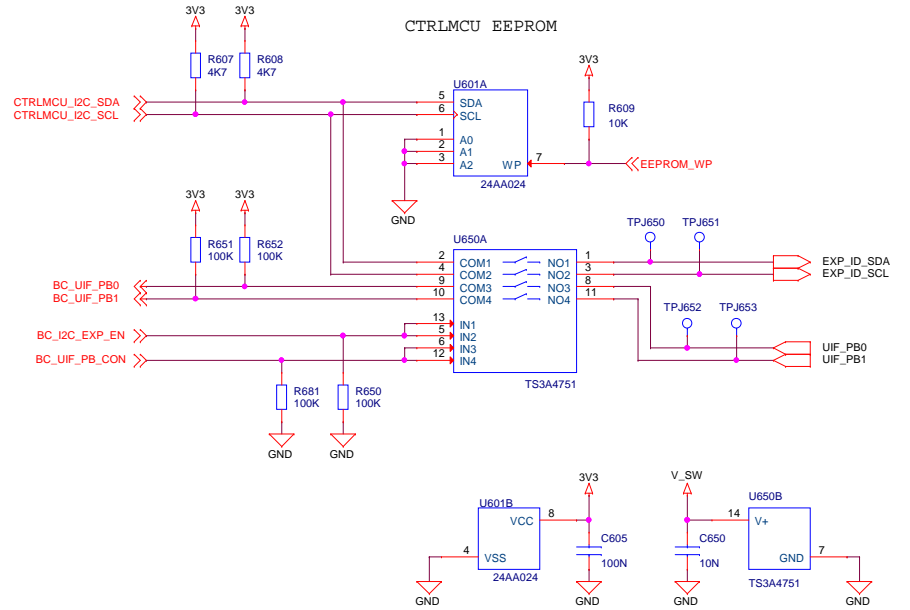
### ADC reference voltage



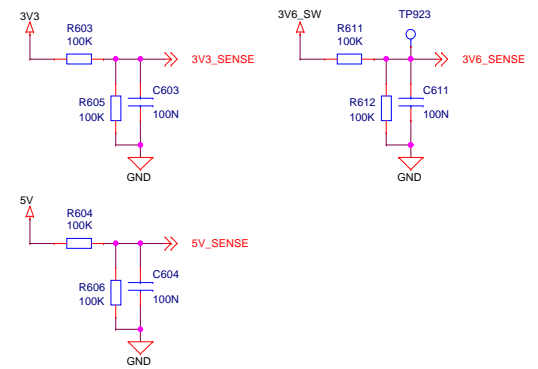
### CTRLMCU SERIAL FLASH




### CTRLMCU EEPROM



### POWER SENSE



/HB1/CMCU1  
Control MCU

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		<b>EFM8 Laser Bee Starter Kit</b>	
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		<b>Board Controller Misc</b>	
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