EFM8LB1 Laser Bee STK

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.
A03	Updated EFM8LB1 revision. Moved reset switch. Fixed EXP pinout description.
A04	Un-mounted D801.

PCB1

PCB5300

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STK

SILICON LABS

Designed: MRW	Approved: JNO
Size A3	BOM Doc No:
Design Created Date: Wednesday, December 03, 2008	

Schematic Title
EFM8LB1 Laser Bee STK

Page Title
Title Page

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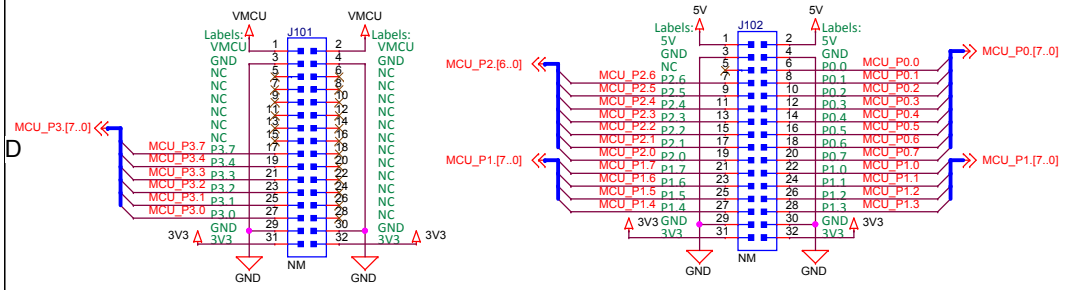
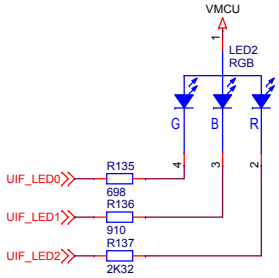
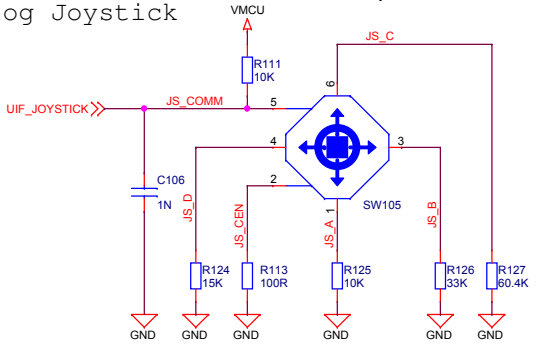
Breakout Connections



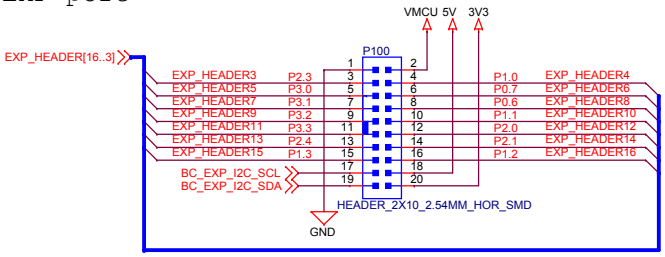
RGB LED



Analog Joystick



EXP port

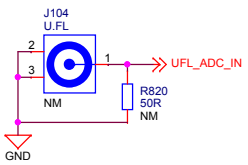


EXP-Header Functionality

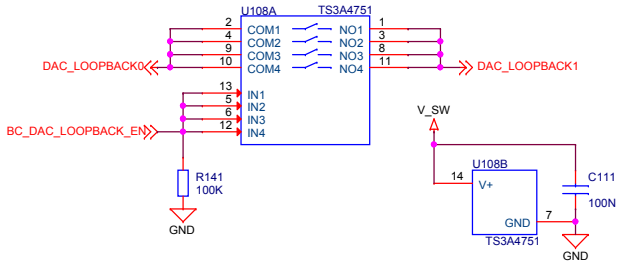
1	GND		
3	P2.3		CMP1.5/ADC0.16
5	P3.0		DAC0
7	P3.1		DAC1
9	P3.2		DAC2
11	P3.3		DAC3
13	P2.4		CMP1.6/ADC0.17
15	P1.3	I2C0_SCL	ADC0.9
17	Reserved for EXP Board Identification		
19	Reserved for EXP Board Identification		

2	VMCU		
4	P1.0	SPI0_MOSI	CMP1.1/ADC0.6
6	P0.7	SPI0_MISO	CMP0.5/ADC0.5
8	P0.6	SPI0_SCK	CMP0.4/ADC0.5
10	P1.1	SPI0_NSS	CMP0.7/ADC0.7
12	P2.0	UART1_TX	CMP1.3/ADC0.14
14	P2.1	UART1_RX	CMP1.4/ADC0.15
16	P1.2	I2C0_SDA	CMP0.8/ADC0.8
18	5V		
20	3V3		

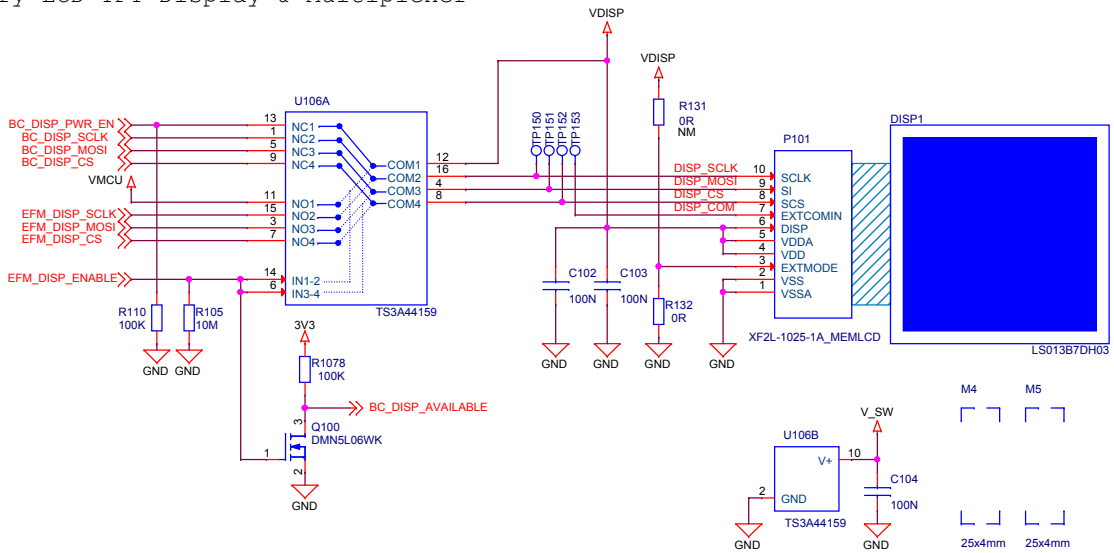
U.FL ADC Connection



DAC Loopback Analog Switch



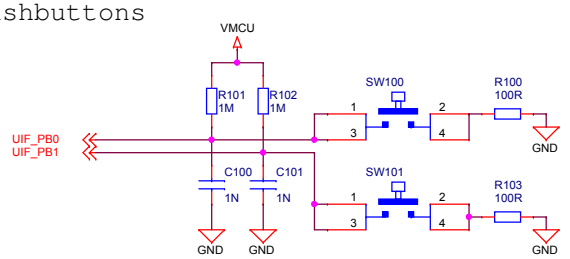
Memory LCD-TFT Display & Multiplexer



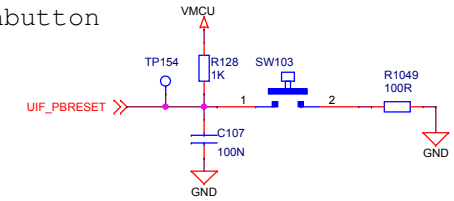
The EFM8 always controls ownership of the display using the EFM_DISP_ENABLE signal.

EFM_DISP_ENABLE	DISP_CTRL	VDISP
0	BC	BC_DISP_PWR_EN
1	EFM	VMCU

User pushbuttons



RESET Pushbutton



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STK

SILICON LABS

Designed: MRW	Approved: JNO
Size: A3	BOM Doc No:
Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM8LB1 Laser Bee STK**

Page Title: **User Interface**

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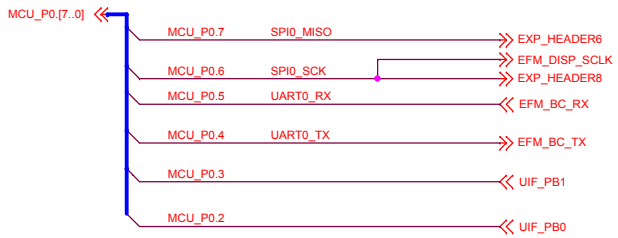
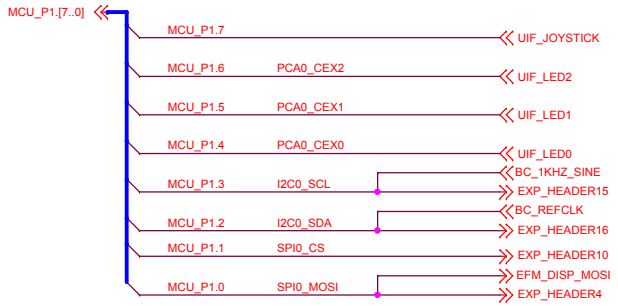
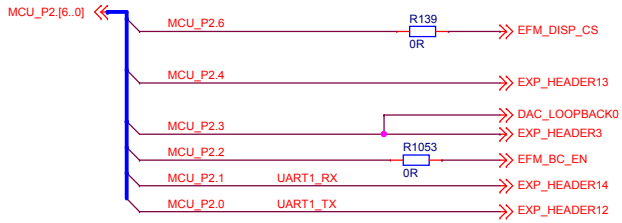
P0 Connections



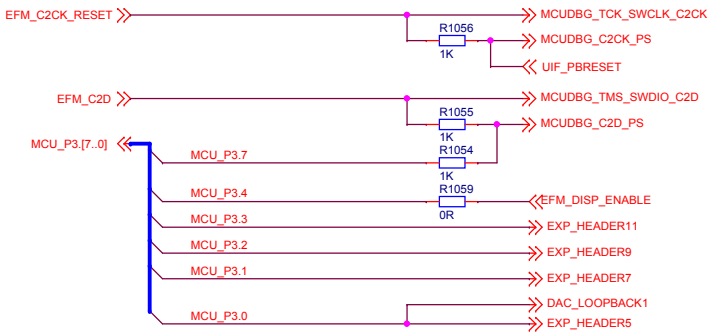
P1 Connections



P2 Connections



P3 & DEBUG Connections



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STK

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Designed: MRW	Approved: JNO
Size A3	BOM Doc No:
Design Created Date: Wednesday, December 03, 2008	

Schematic Title
EFM8LB1 Laser Bee STK

Page Title
Signal Assignments

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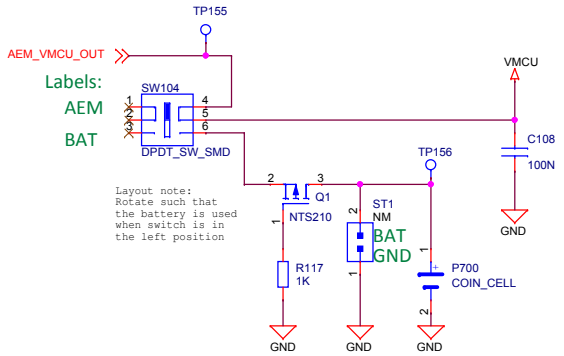
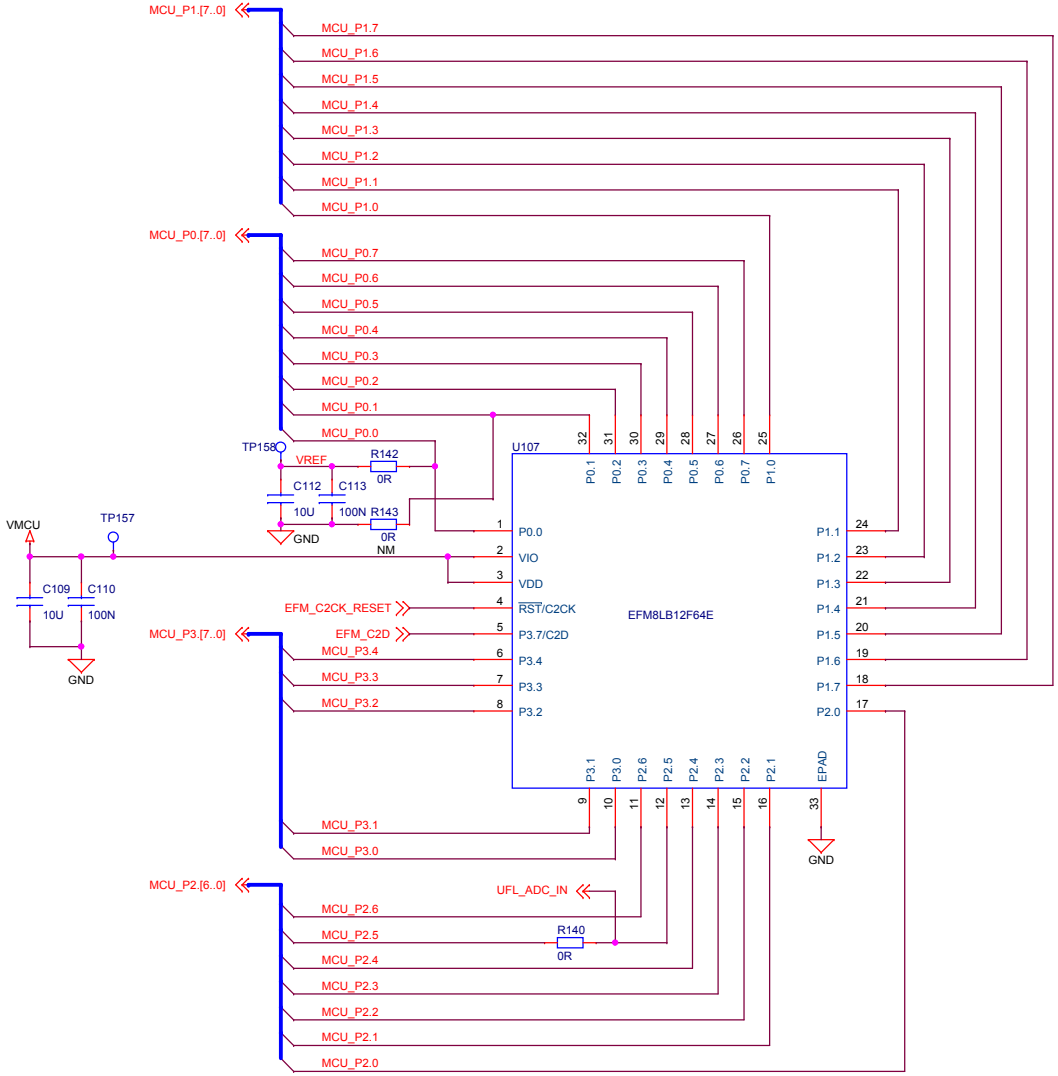
Power Switch

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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STK

SILICON LABS

Schematic Title	EFM8LB1 Laser Bee STK
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Designed: MRW	Approved: JNO
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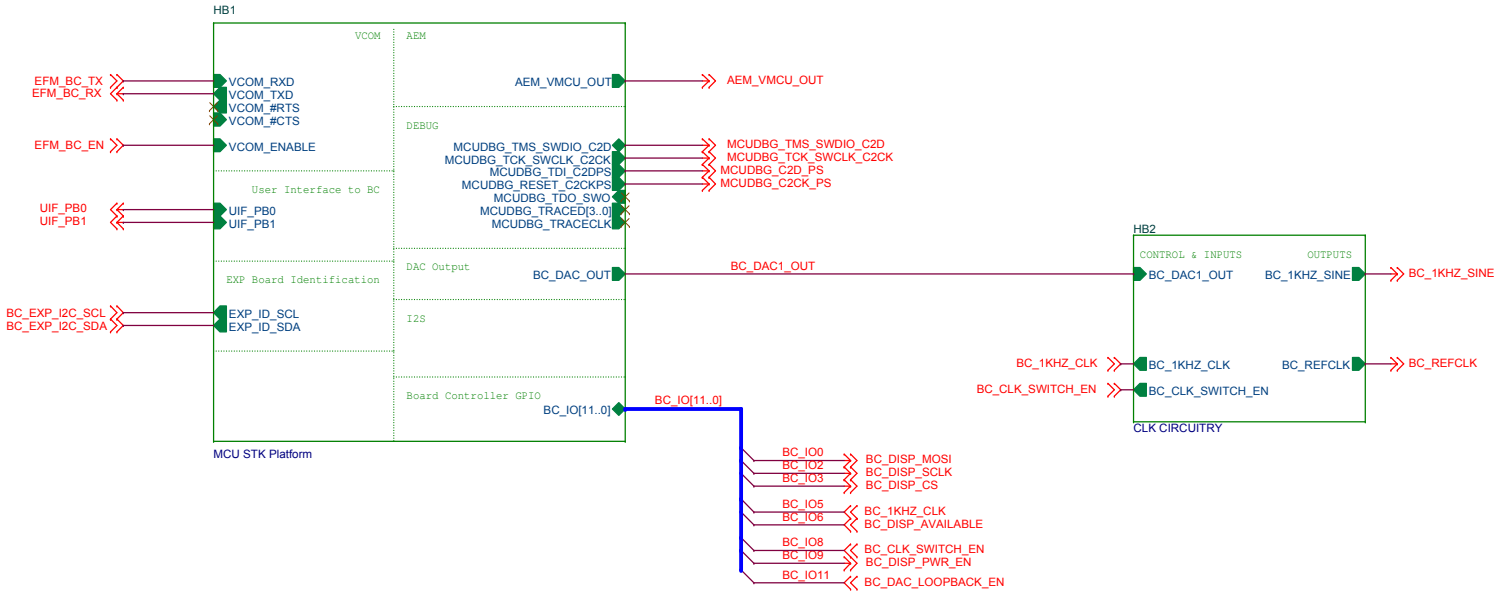

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STK

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Schematic Title
EFM8LB1 Laser Bee STK

Page Title
STK Common Platform

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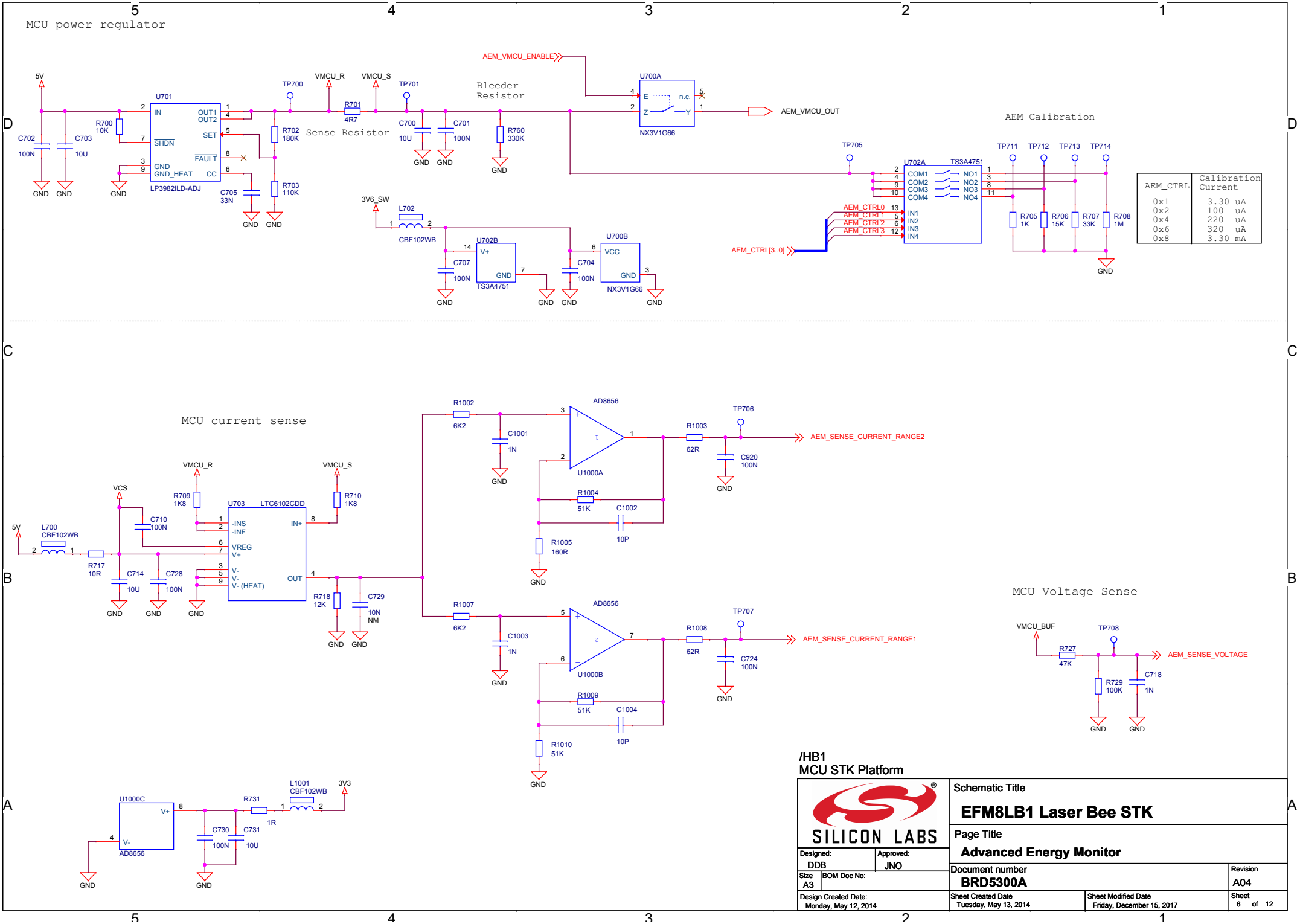

/HB1
MCU STK Platform

SILICON LABS

Designed: DDB	Approved: JNO
Size A3	BOM Doc No:
Design Created Date: Monday, May 12, 2014	

Schematic Title
EFM8LB1 Laser Bee STK

Page Title
Advanced Energy Monitor

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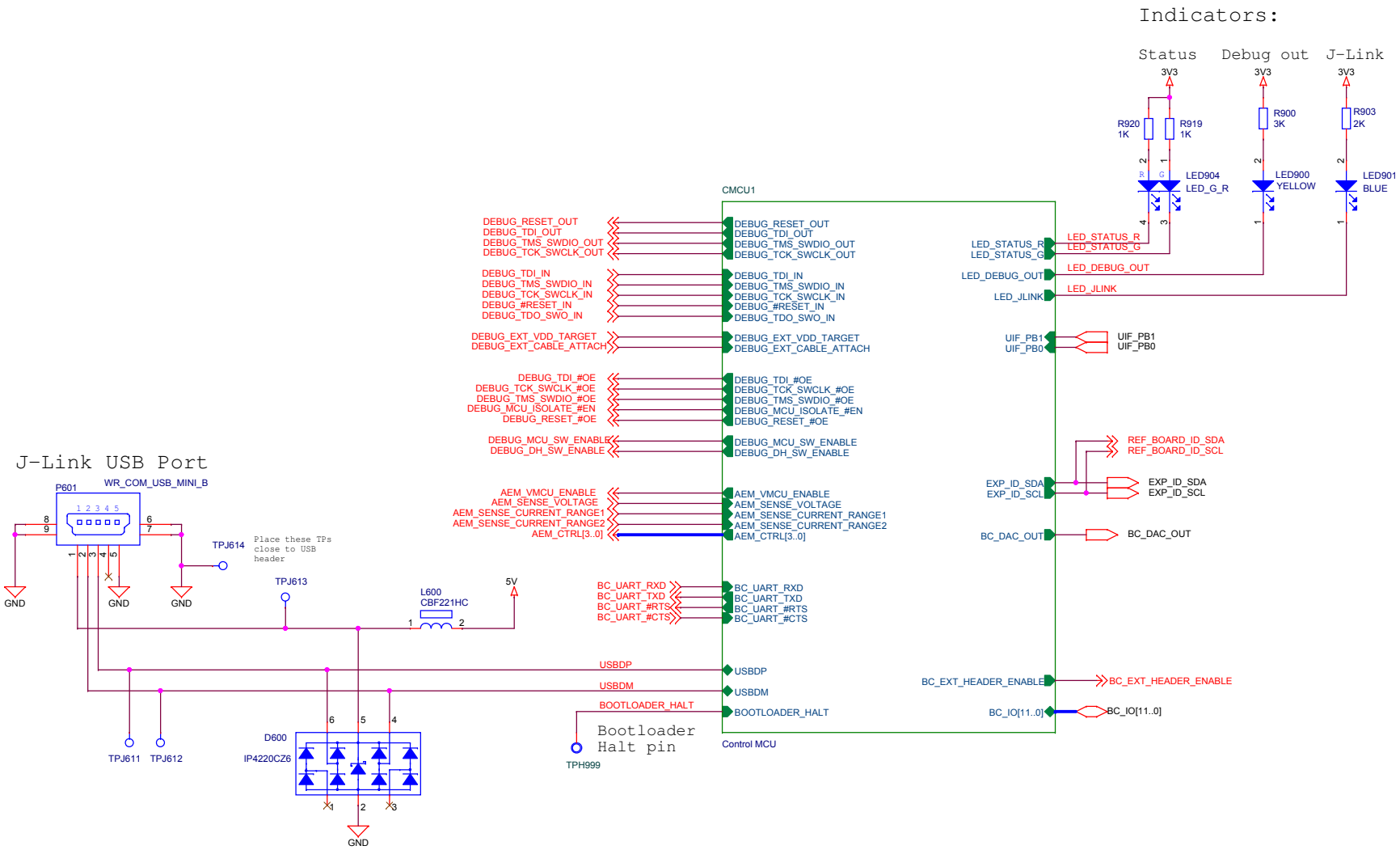

/HB1
MCU STK Platform

SILICON LABS

Designed: ANB	Approved: JNO
Size: A3	BOM Doc No:
Design Created Date: Monday, May 12, 2014	

Schematic Title: **EFM8LB1 Laser Bee STK**

Page Title: **Control MCU**

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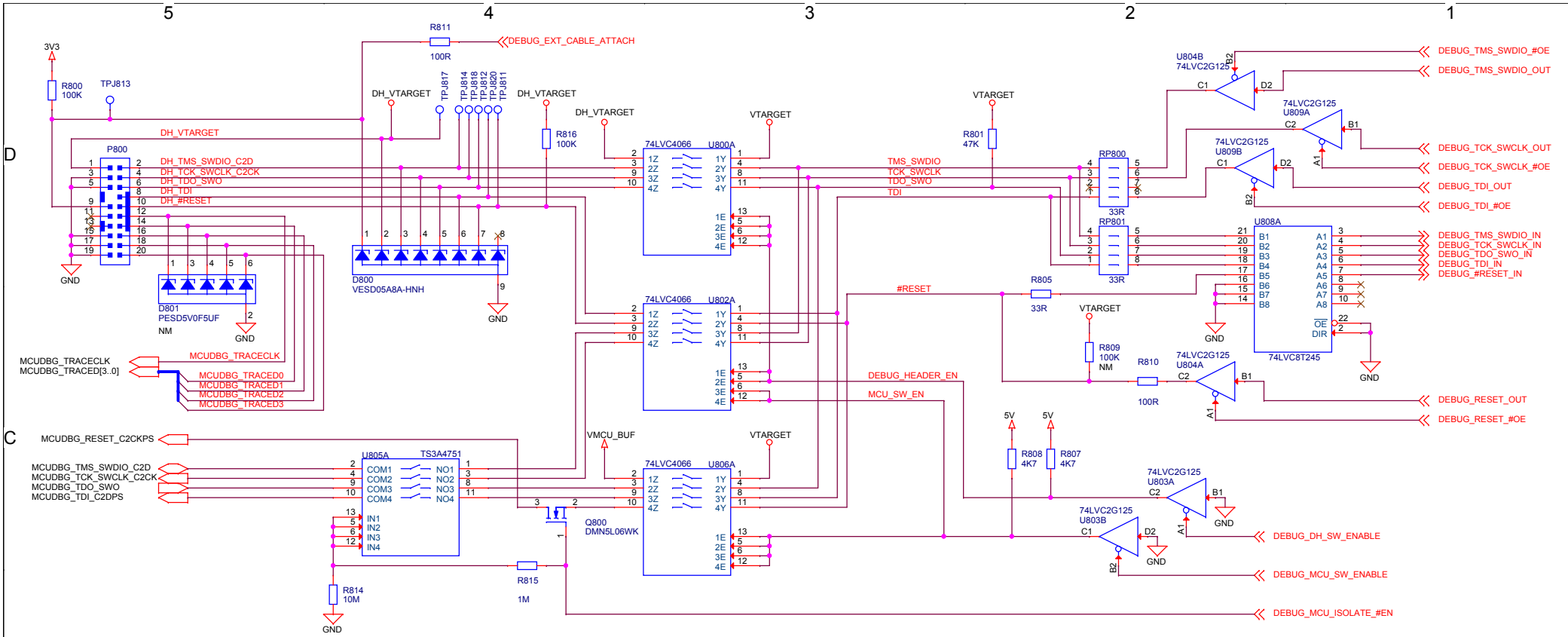
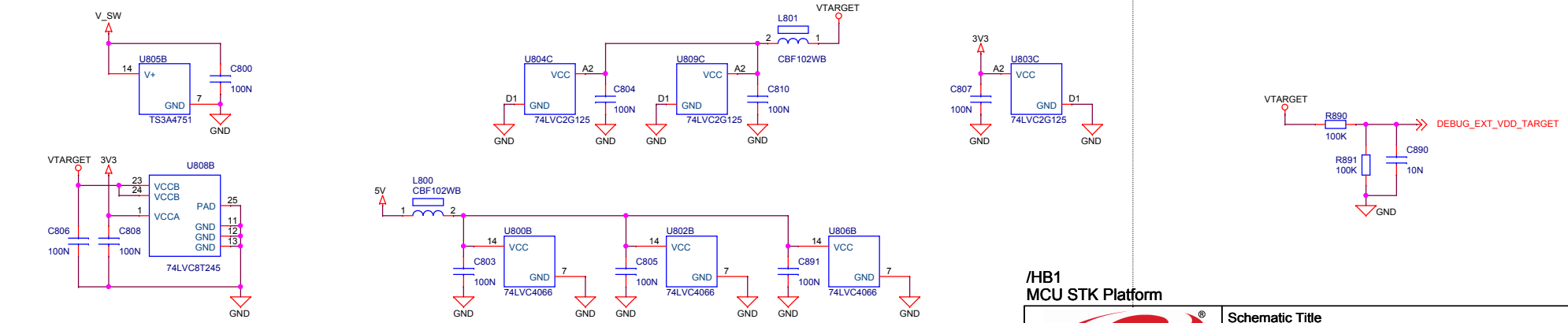


Power & Decoupling



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

SILICON LABS

Designed: DDB	Approved: JNO
Size A3	BOM Doc No:
Design Created Date: Monday, May 12, 2014	

Schematic Title
EFM8LB1 Laser Bee STK

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Debug Interface

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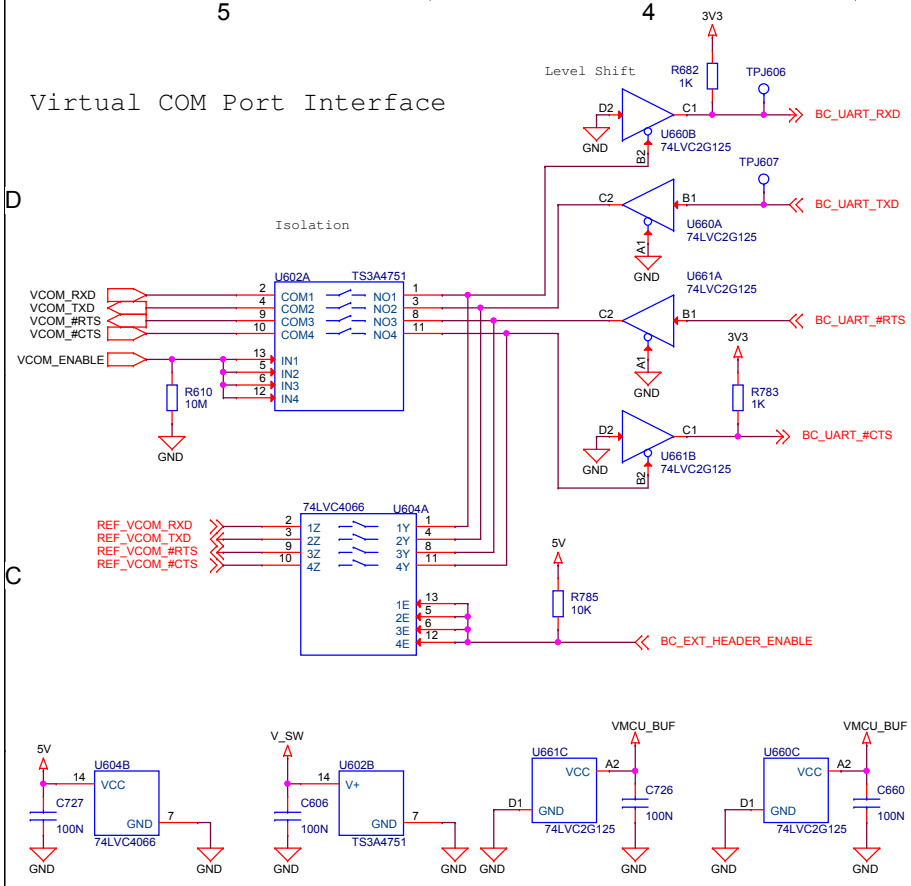
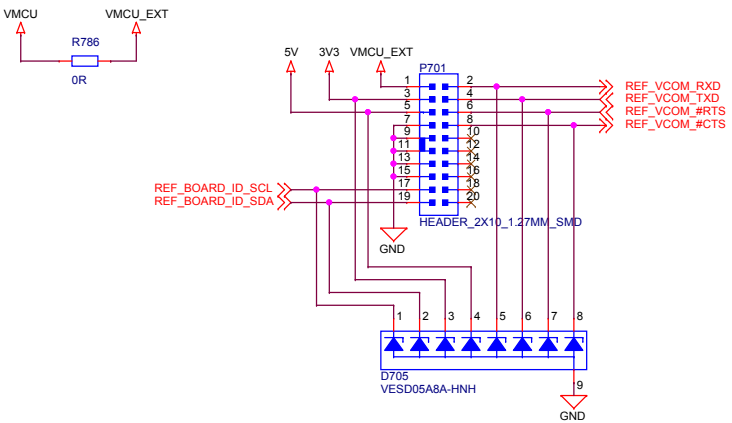
Virtual COM Port Interface

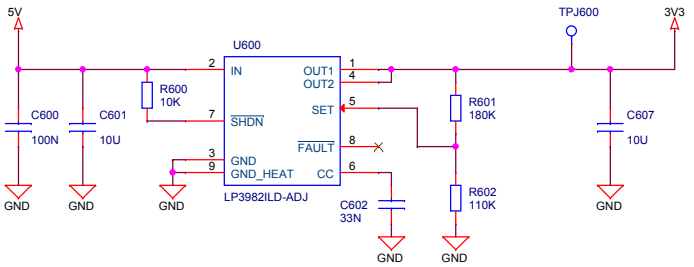


Connector for external reference designs boards

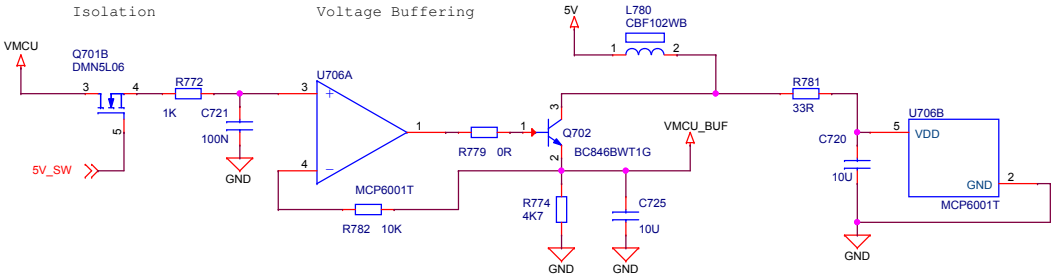
EXTERNAL BOARD



3V3 Regulator



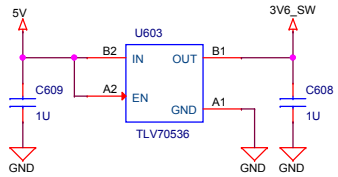
VMCU Voltage Mirror

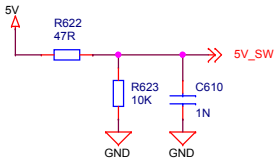


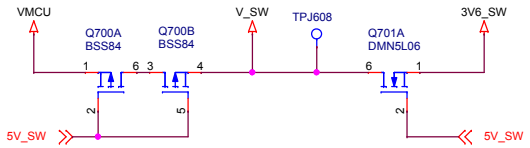
Power Supply for Analog Switches

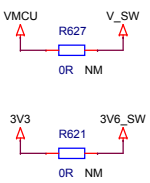
The USB VBUS voltage is used to bias these transistors, turning the P-Channel MOSFETs (Q700) off, and the N-Channel MOSFETs (Q701) on.

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









/HB1
MCU STK Platform

SILICON LABS

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Schematic Title
EFM8LB1 Laser Bee STK

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Power & Misc.

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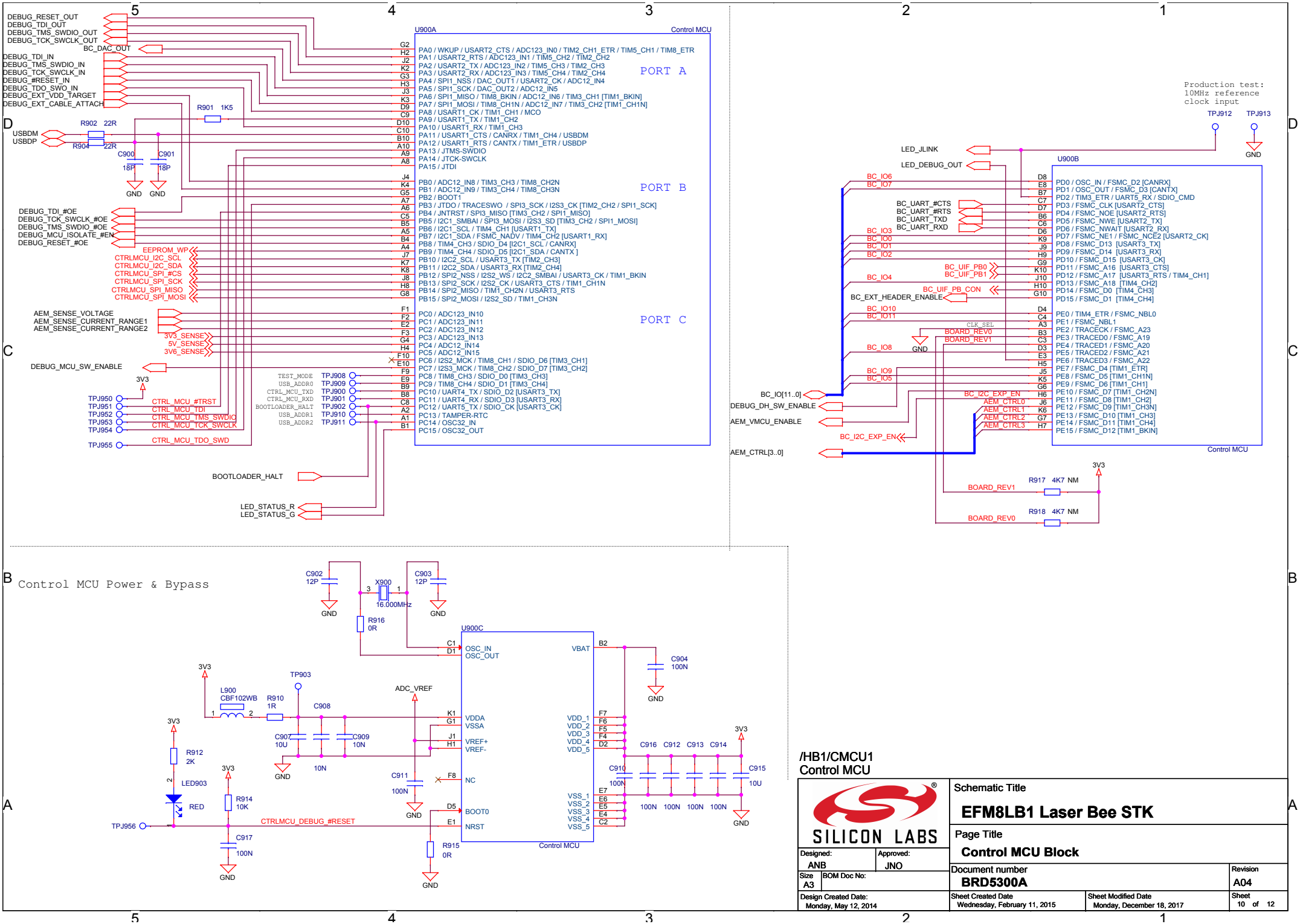

/HB1/CMCU1
Control MCU

SILICON LABS

Designed: ANB	Approved: JNO
Size A3	BOM Doc No:
Design Created Date: Monday, May 12, 2014	

Schematic Title
EFM8LB1 Laser Bee STK

Page Title
Control MCU Block

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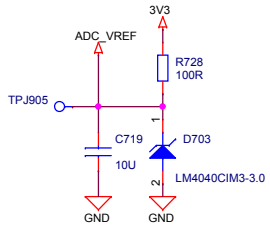
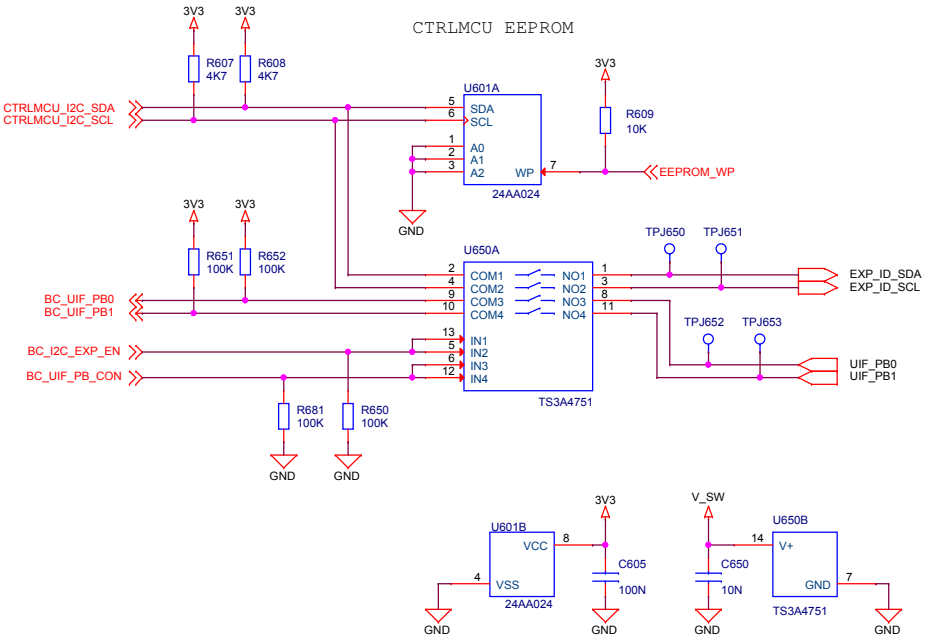
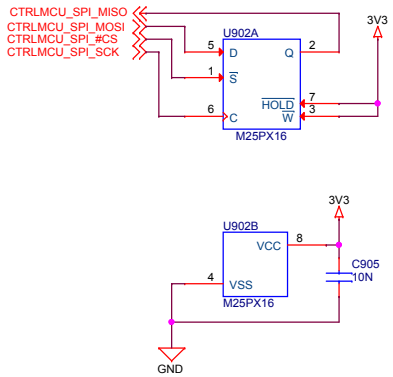
ADC reference voltage



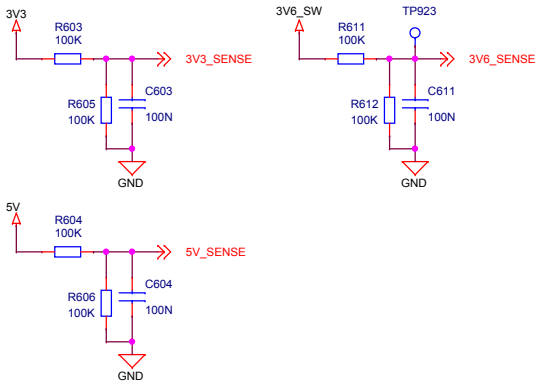
CTRLMCU EEPROM



CTRLMCU SERIAL FLASH



POWER SENSE



/HB1/CMCU1
Control MCU

SILICON LABS

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Schematic Title: **EFM8LB1 Laser Bee STK**

Page Title: **Control MCU Misc.**

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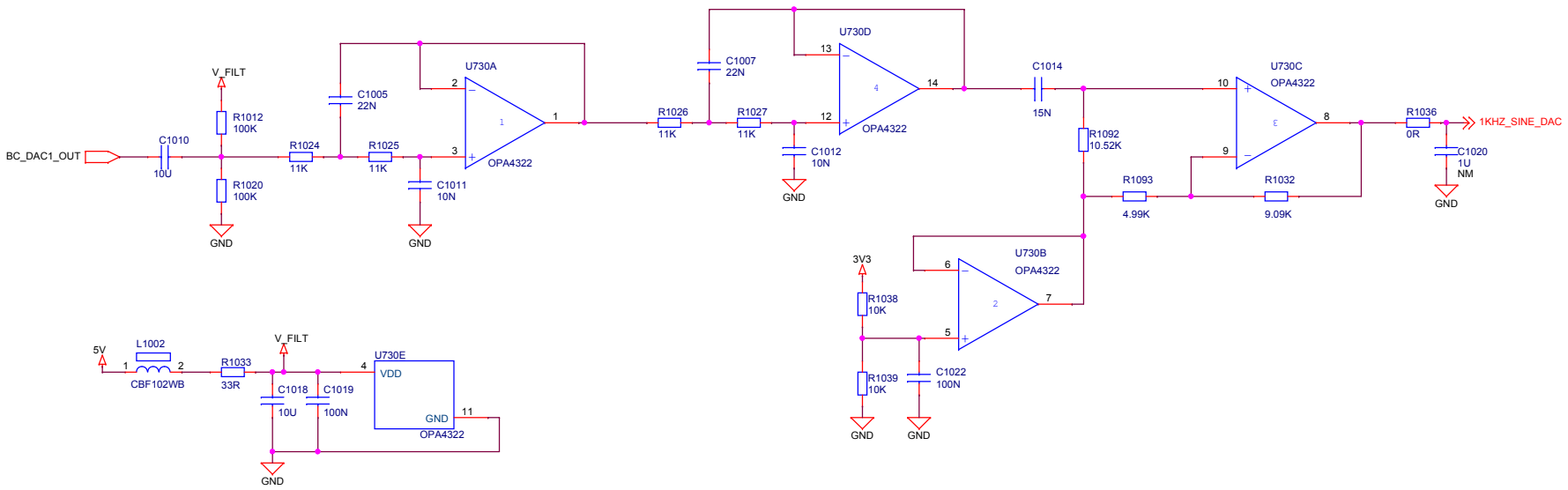
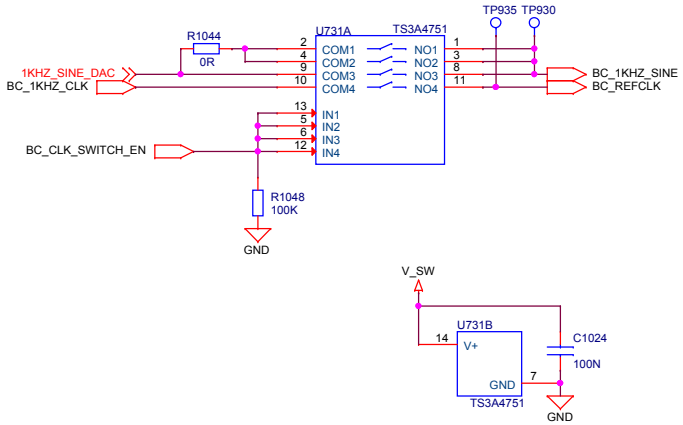
LPF



Analog Switch



SILICON LABS

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Schematic Title: **EFM8LB1 Laser Bee STK**

Page Title: **Clock & Filter**

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