EFM8SB1 Sleepy Bee STK

Revision History

Rev.	Description
A00	Initial version released for production.
A01	Minor updates to design after prototype series. Updated PCB.
A02	Updated PCB revision.
A03	Un-mounted D801.

PCB1

PCB5101

/
STK

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

Schematic Title
EFM8SB1 Sleepy Bee STK

Page Title
Title Page

Document number **BRD5101A**		Revision A03
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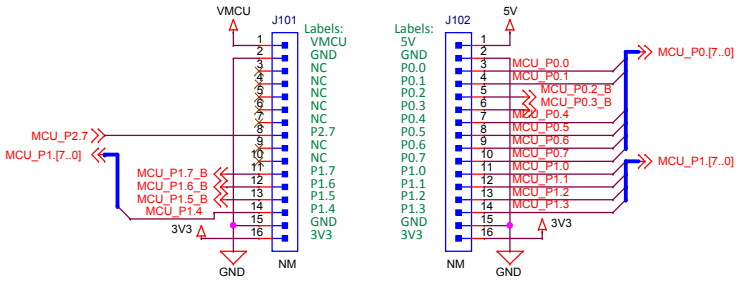
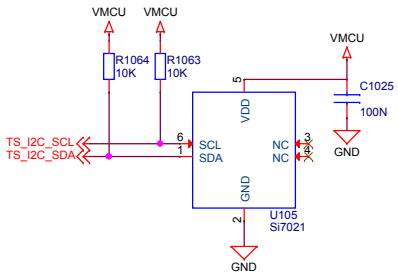
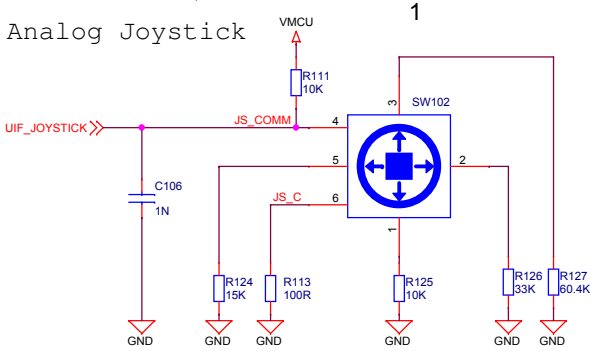
Breakout Connections



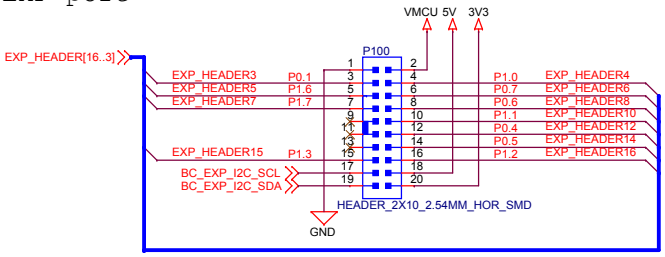
Temperature & Relative Humidity Sensor



Analog Joystick



EXP port



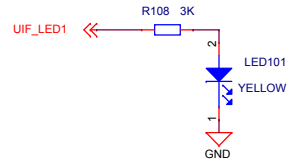
EXP-Header Functionality

** Indicates potential STK hardware conflicts

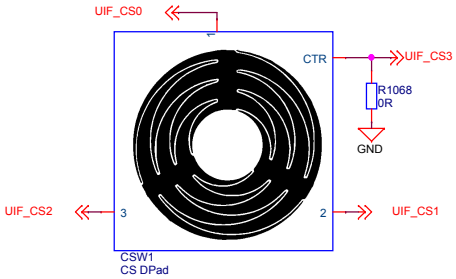
1	GND		
3	P0.1		ADC0.1
5	P1.6		
7	P1.7		
9			
11			
13			
15	P1.3	I2C0_SCL	ADC0.11
17	Reserved for EXP Board Identification		
19	Reserved for EXP Board Identification		

2	VMCU			
4	P1.0	SPI0_MOSI	CMP0P	
6	P0.7	SPI0_MISO	ADC0.7	
8	P0.6	SPI0_SCK	ADC0.6	
10	P1.1	SPI0_NSS	CMP0N	** STK LED0
12	P0.4	UART0_TX	ADC0.4	
14	P0.5	UART0_RX	ADC0.5	
16	P1.2	I2C0_SDA	ADC0.10	
18	5V			
20	3V3			

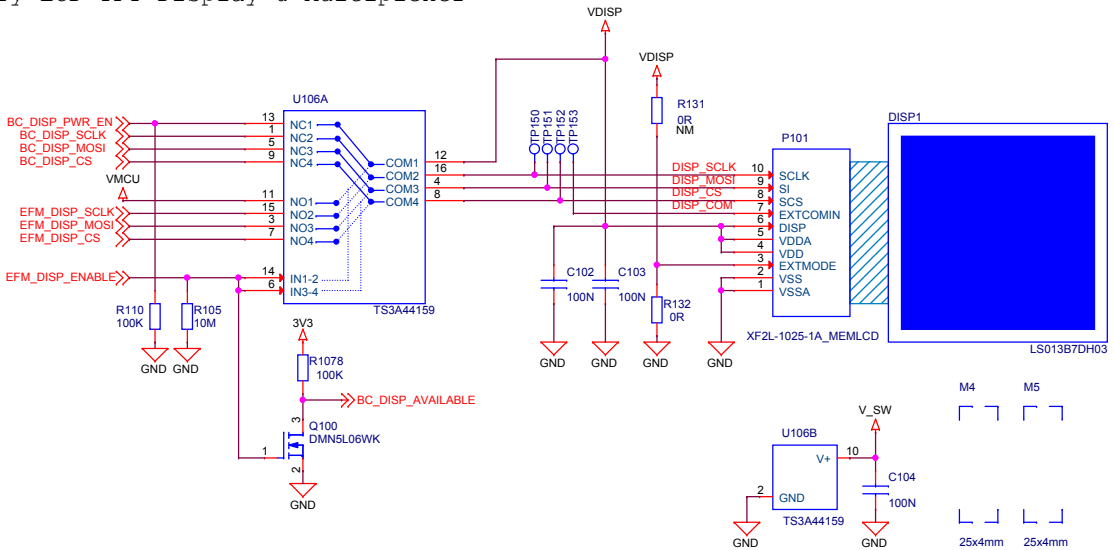
LED



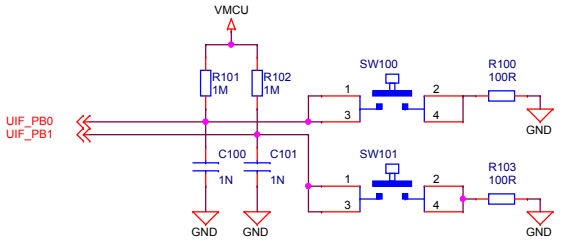
Capsense Rotor



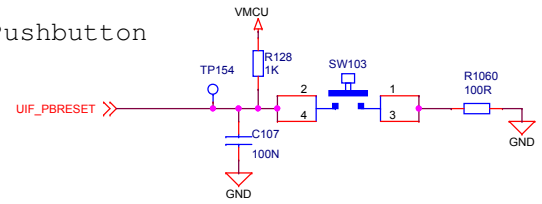
Memory LCD-TFT Display & Multiplexer



User pushbuttons



RESET Pushbutton



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

/
STK

SILICON LABS

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

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EFM8SB1 Sleepy Bee STK

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User Interfaces

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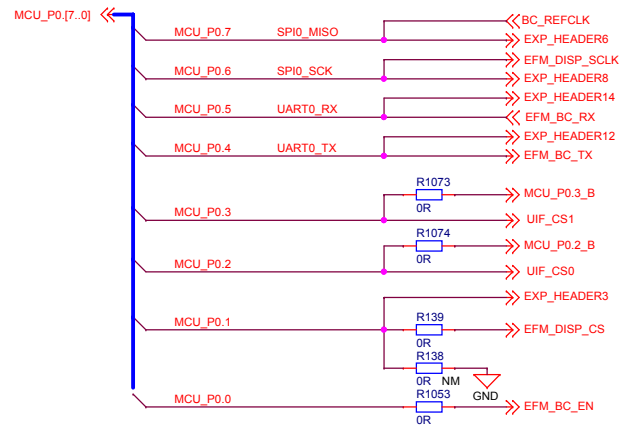
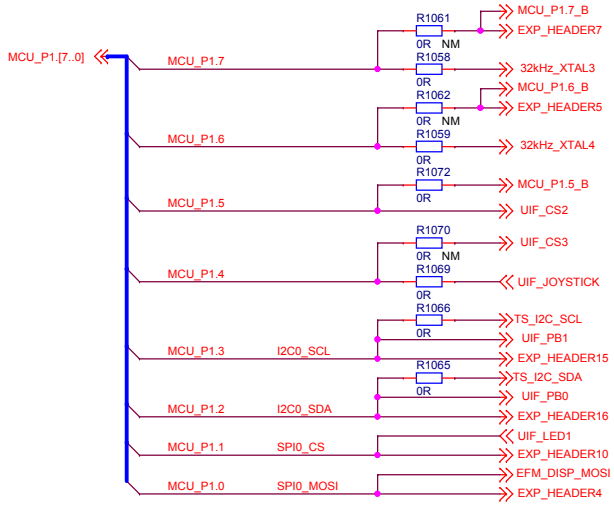
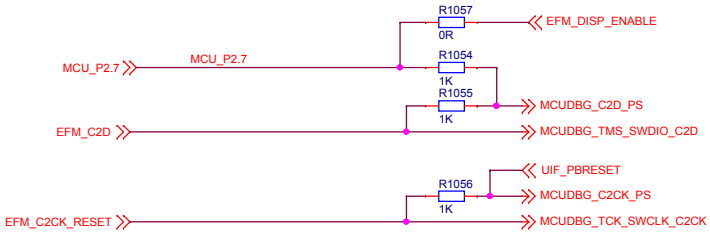
P0 Connections



P1 Connections



P2 & DEBUG Connections



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STK

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Schematic Title
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BRD5101A

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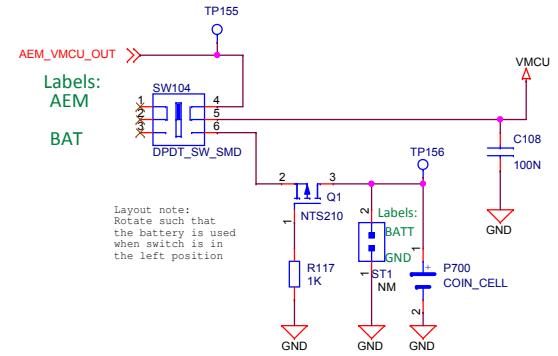
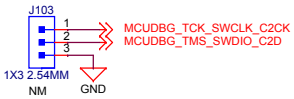
Power Switch

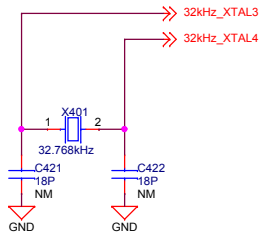
SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
BAT	AEM Disabled, VMCU sourced from external coin-cell battery or external power supply

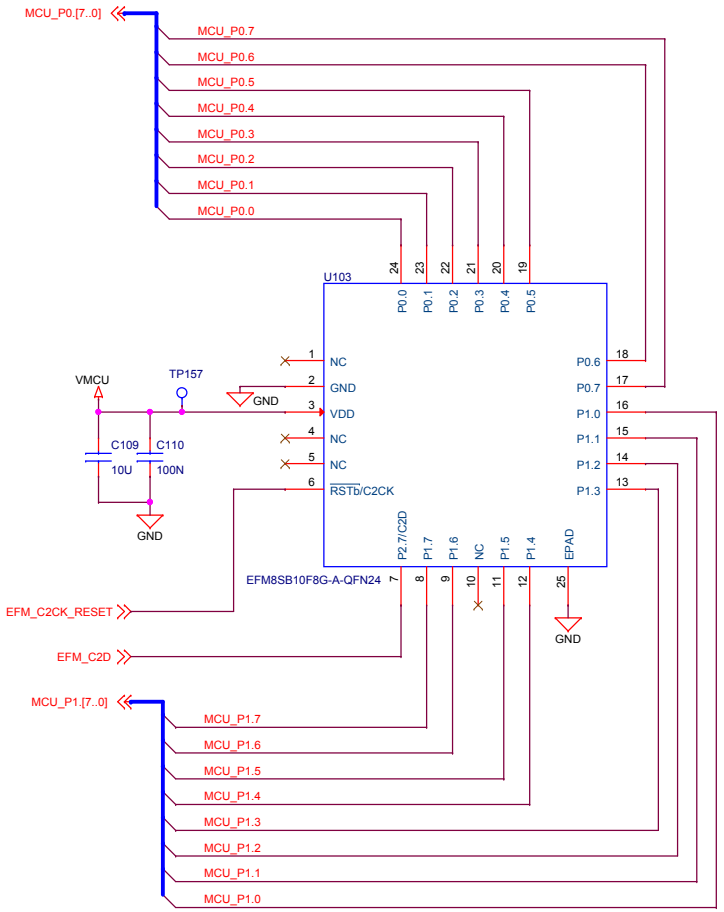


C2 Debug Header



Low Frequency Clock





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STK

SILICON LABS

Designed: MRW	Approved: JNO	Schematic Title: EFM8SB1 Sleepy Bee STK
Size: A3	BOM Doc No:	Page Title: EFM8 I/O & Power
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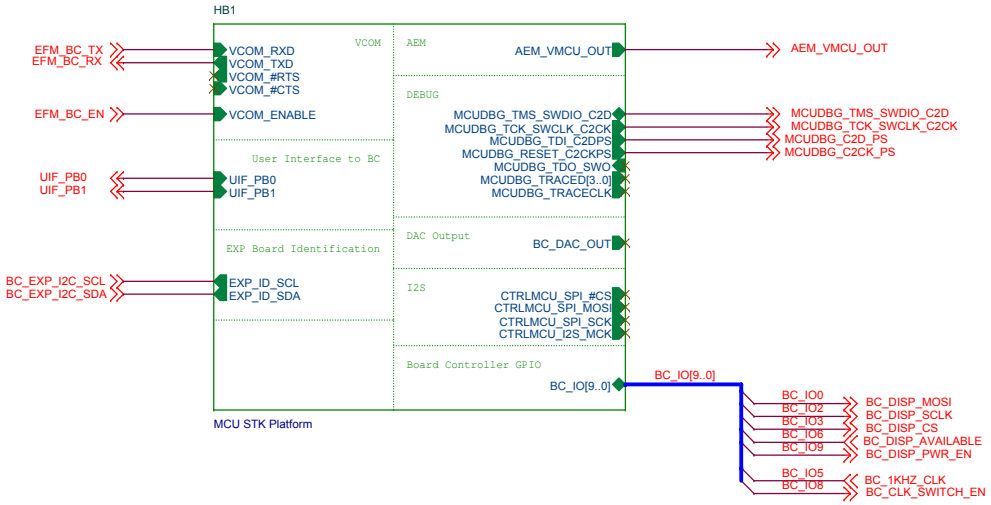
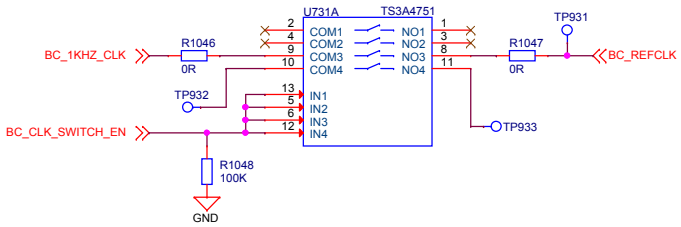
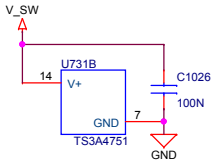


Analog Switch





/
STK

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Schematic Title	**EFM8SB1 Sleepy Bee STK**
Page Title	**STK Common Platform**
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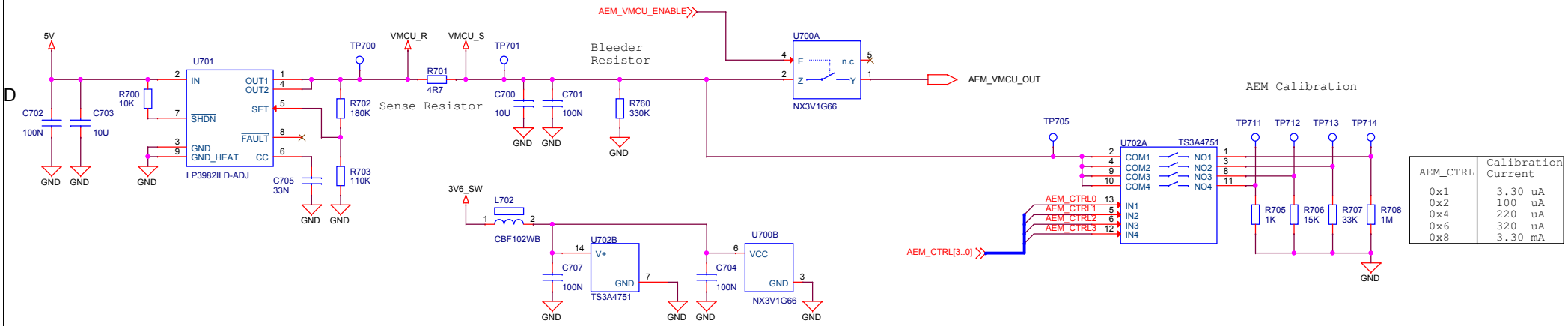
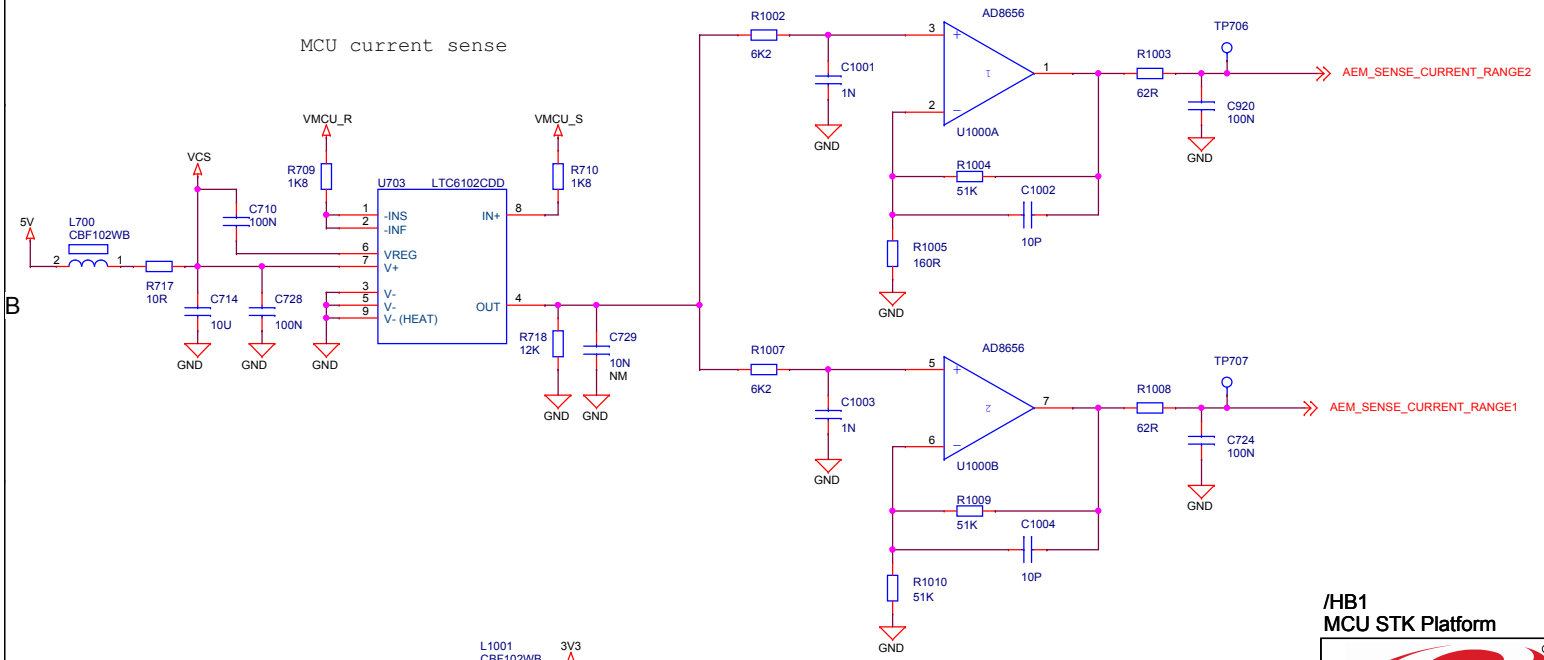
MCU power regulator

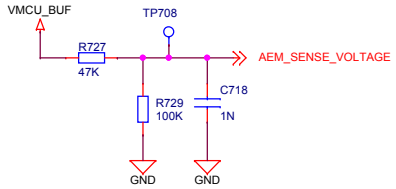


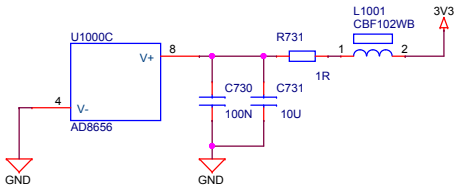
AEM_CTRL	Calibration Current
0x1	3.30 uA
0x2	100 uA
0x4	220 uA
0x6	320 uA
0x8	3.30 mA

MCU current sense



MCU Voltage Sense





/HB1
MCU STK Platform

SILICON LABS

Designed: DDB	Approved: JNO
Size A3	BOM Doc No:
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Advanced Energy Monitor

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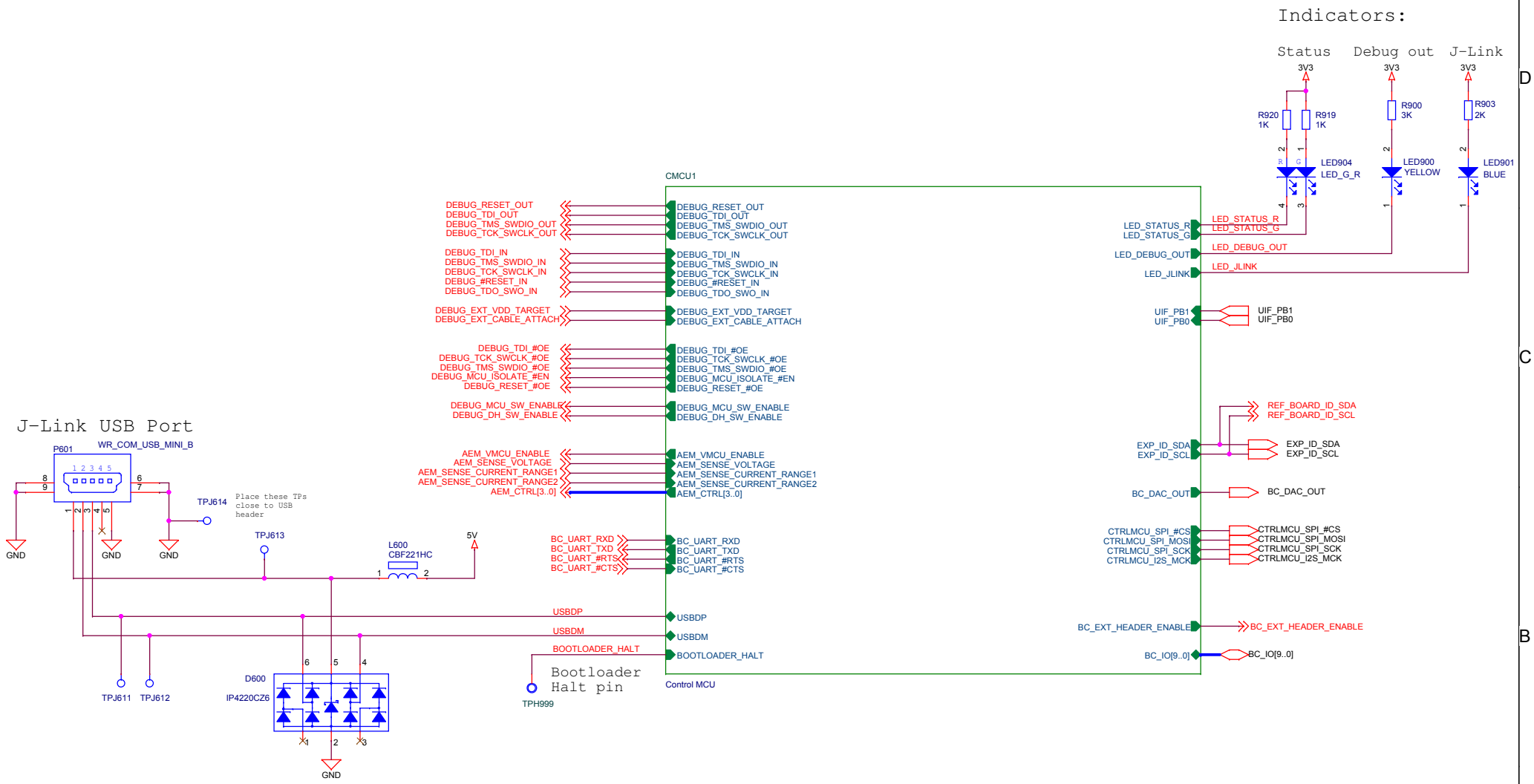

/HB1
MCU STK Platform

SILICON LABS

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Page Title	Control MCU
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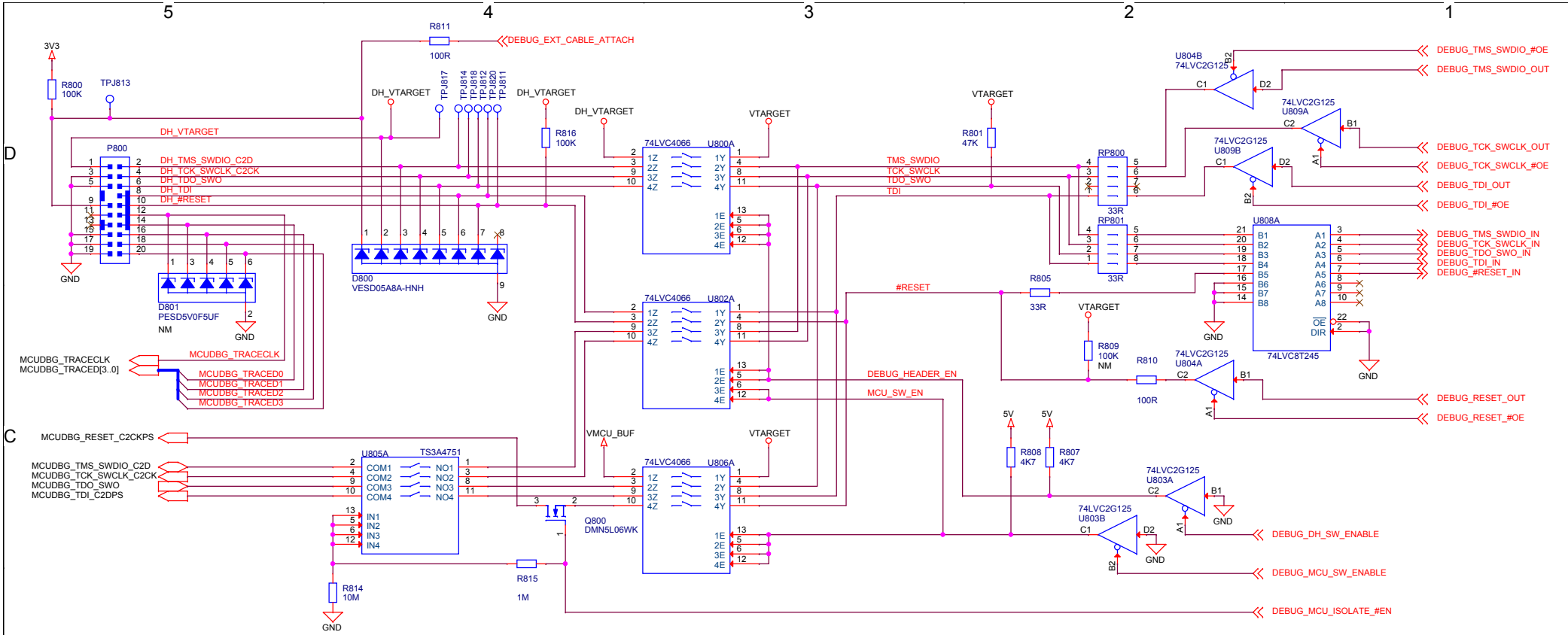
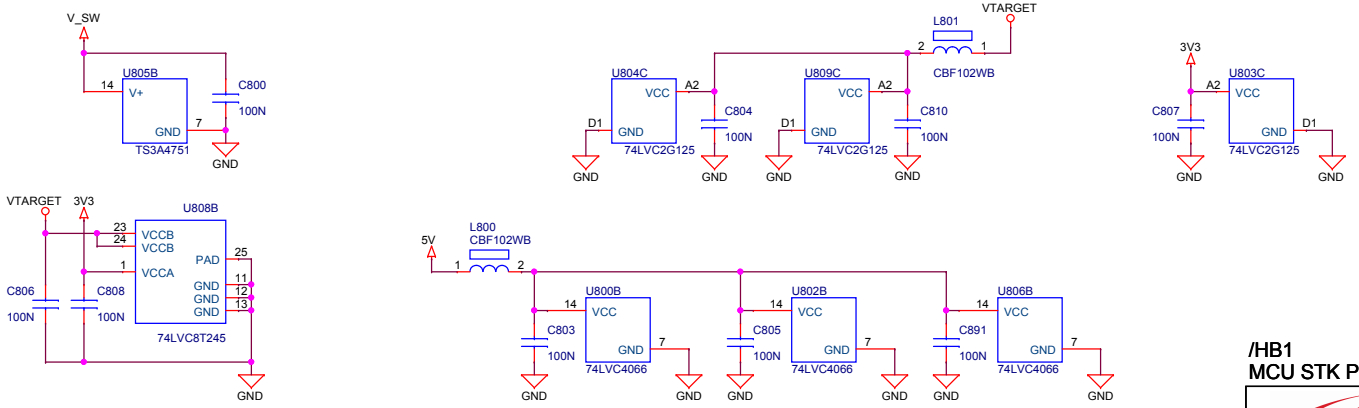
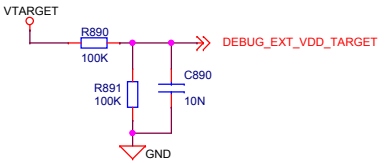


Power & Decoupling





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
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Debug Interface

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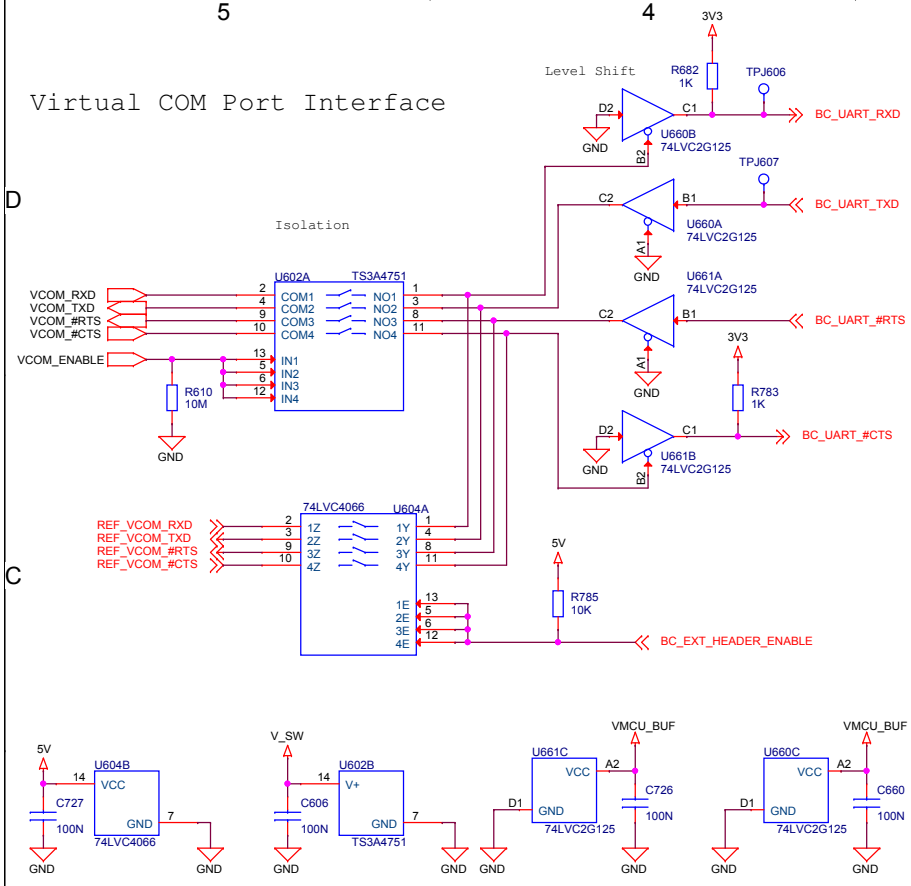
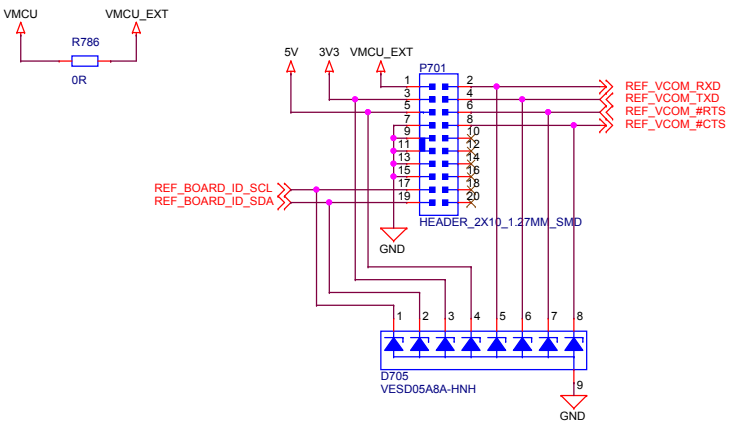
Virtual COM Port Interface

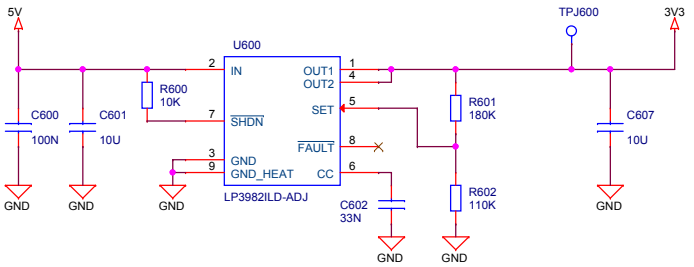


Connector for external reference designs boards

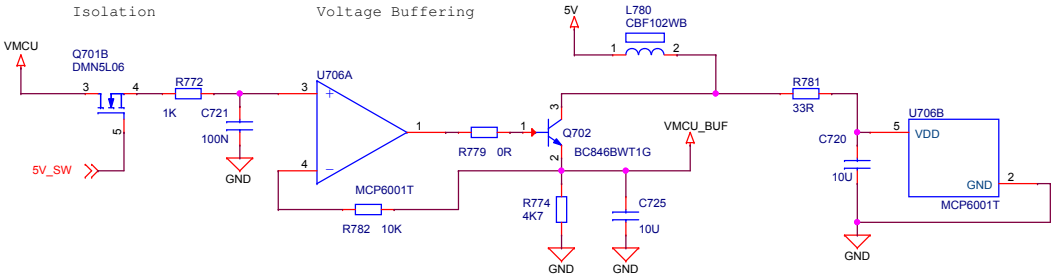
EXTERNAL BOARD



3V3 Regulator



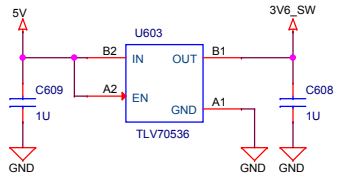
VMCU Voltage Mirror

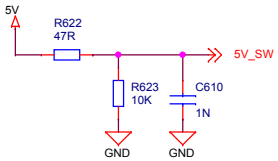


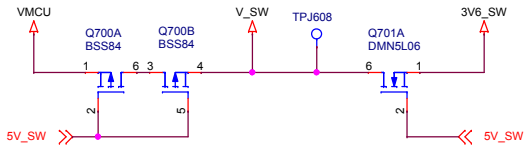
Power Supply for Analog Switches

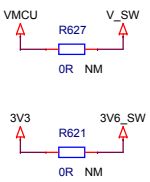
The USB VBUS voltage is used to bias these transistors, turning the P-Channel MOSFETs (Q700) off, and the N-Channel MOSFETs (Q701) on.

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

Designed: DDB	Approved: JNO
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Power & Misc.

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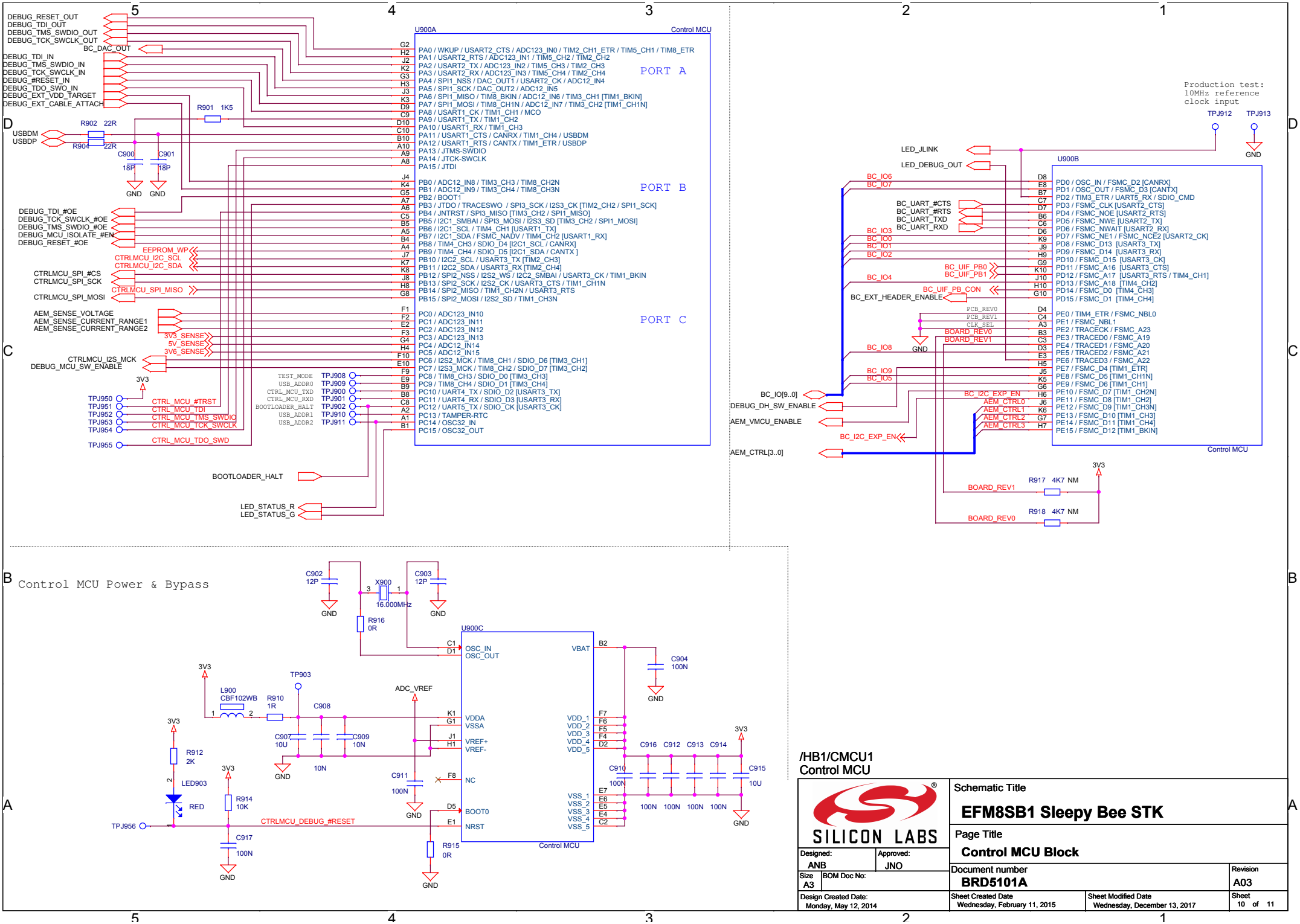

/HB1/CMCU1
Control MCU

SILICON LABS

Designed: ANB	Approved: JNO
Size A3	BOM Doc No:
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Schematic Title
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Control MCU Block

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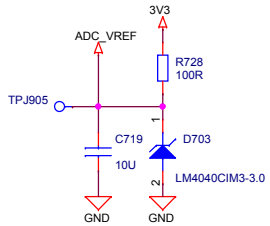
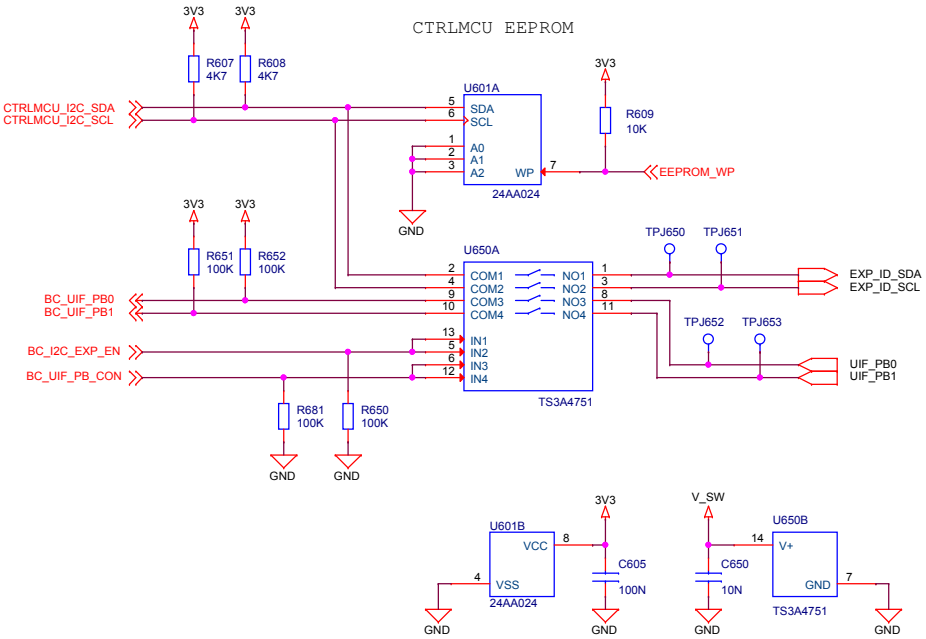
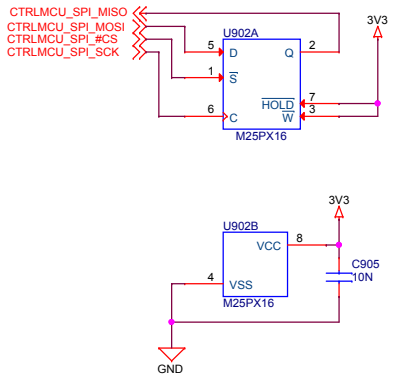
ADC reference voltage



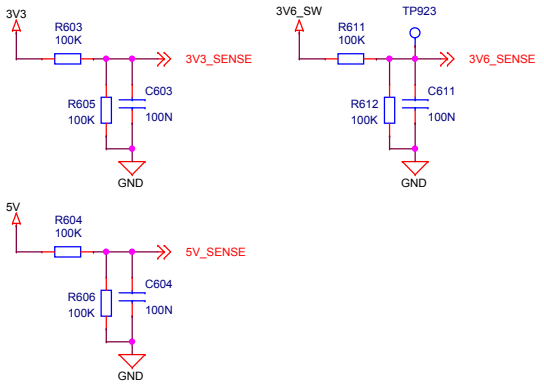
CTRLMCU EEPROM



CTRLMCU SERIAL FLASH



POWER SENSE



/HB1/CMCU1
Control MCU

SILICON LABS

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

Schematic Title: **EFM8SB1 Sleepy Bee STK**

Page Title: **Control MCU Misc.**

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