



EFM32 Happy Gecko STK

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Revision History

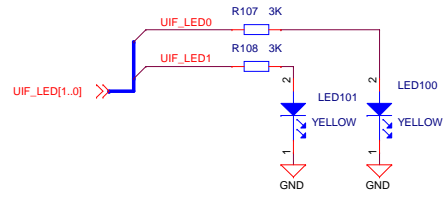
Rev.	Description
A00	First production release.
B00	Updated Board Controller pin-out.
B01	Minor update to secondary (target USB) AEM channel.



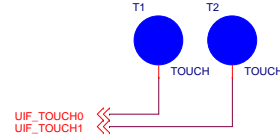
EFM32 HG STK

<p>SILICON LABS</p>		Schematic Title	
		EFM32 Happy Gecko Starter Kit	
Designed: DDB Approved: JNO		Page Title	
		Title Page	
Size A3	BOM Doc No: <Cage Code>	Document number BRD2012A	Revision B01
Design Created Date: Wednesday, December 03, 2008	Sheet Created Date Saturday, March 21, 2009	Sheet Modified Date Wednesday, April 08, 2015	Sheet 1 of 10

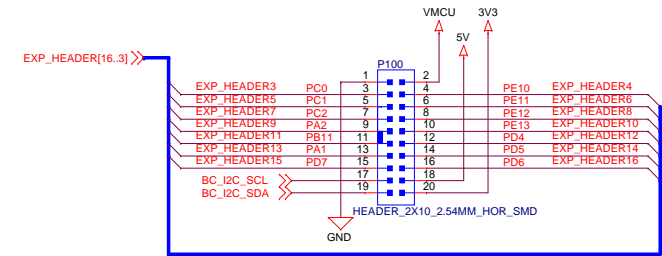
User LEDs



Touch Pads



EXP Header

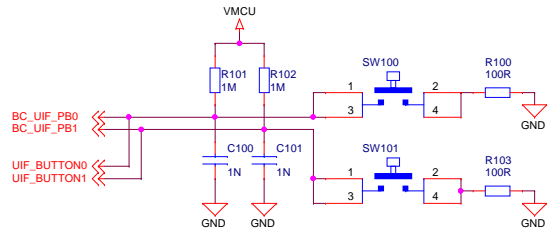


EXP-Header Functionality

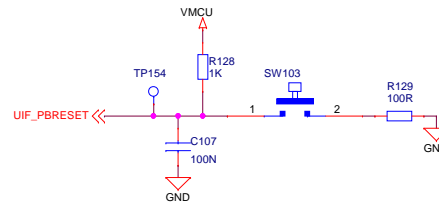
1	GND		
3	PC0		ACMP0_CH0
5	PC1		ACMP0_CH1
7	PC2		ACMP0_CH2
9	PA2		
11	PB11		IDAC0_OUT
13	PA1		
15	PD7	I2C0_SCL	ADC0_CH7
17			Reserved for EXP Board Identification
19			Reserved for EXP Board Identification

2	VMCU		
4	PE10	US0_TX	
6	PE11	US0_RX	
8	PE12	US0_CLK	ADC0_CH0
10	PE13	US0_CS	ADC0_CH1
12	PD4	LEU0_TX	ADC0_CH4
14	PD5	LEU0_RX	ADC0_CH5
16	PD6	I2C0_SDA	ADC0_CH6
18	5V		
20	3V3		

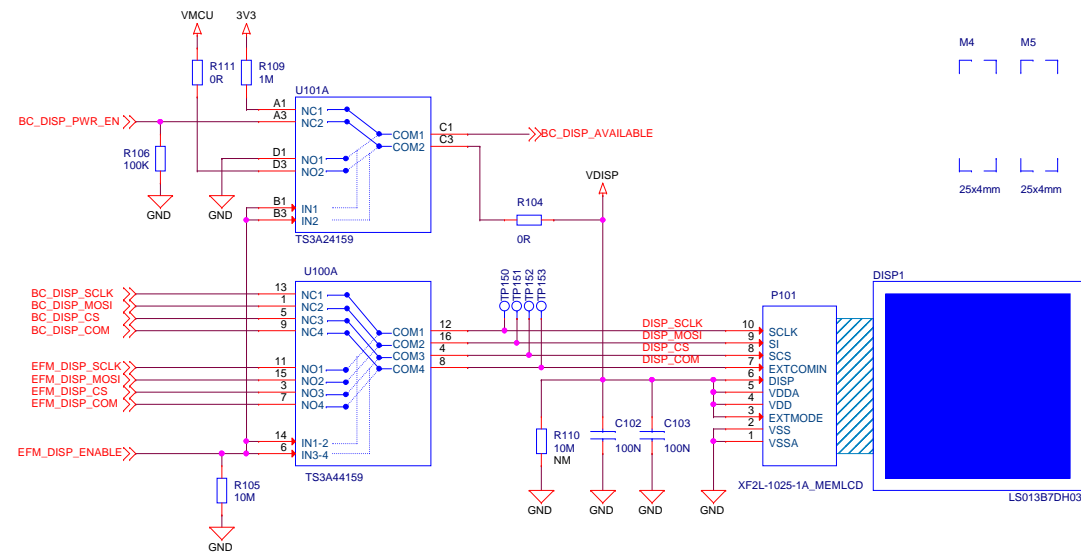
User Pushbuttons



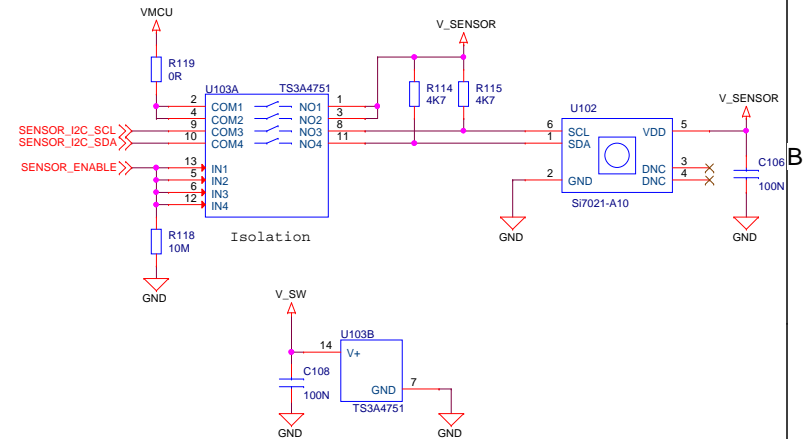
RESET Pushbutton



Memory LCD-TFT Display & Multiplexer



Relative Humidity & Temperature Sensor

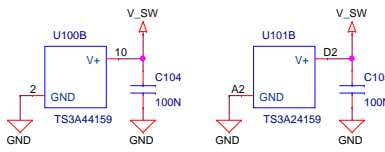


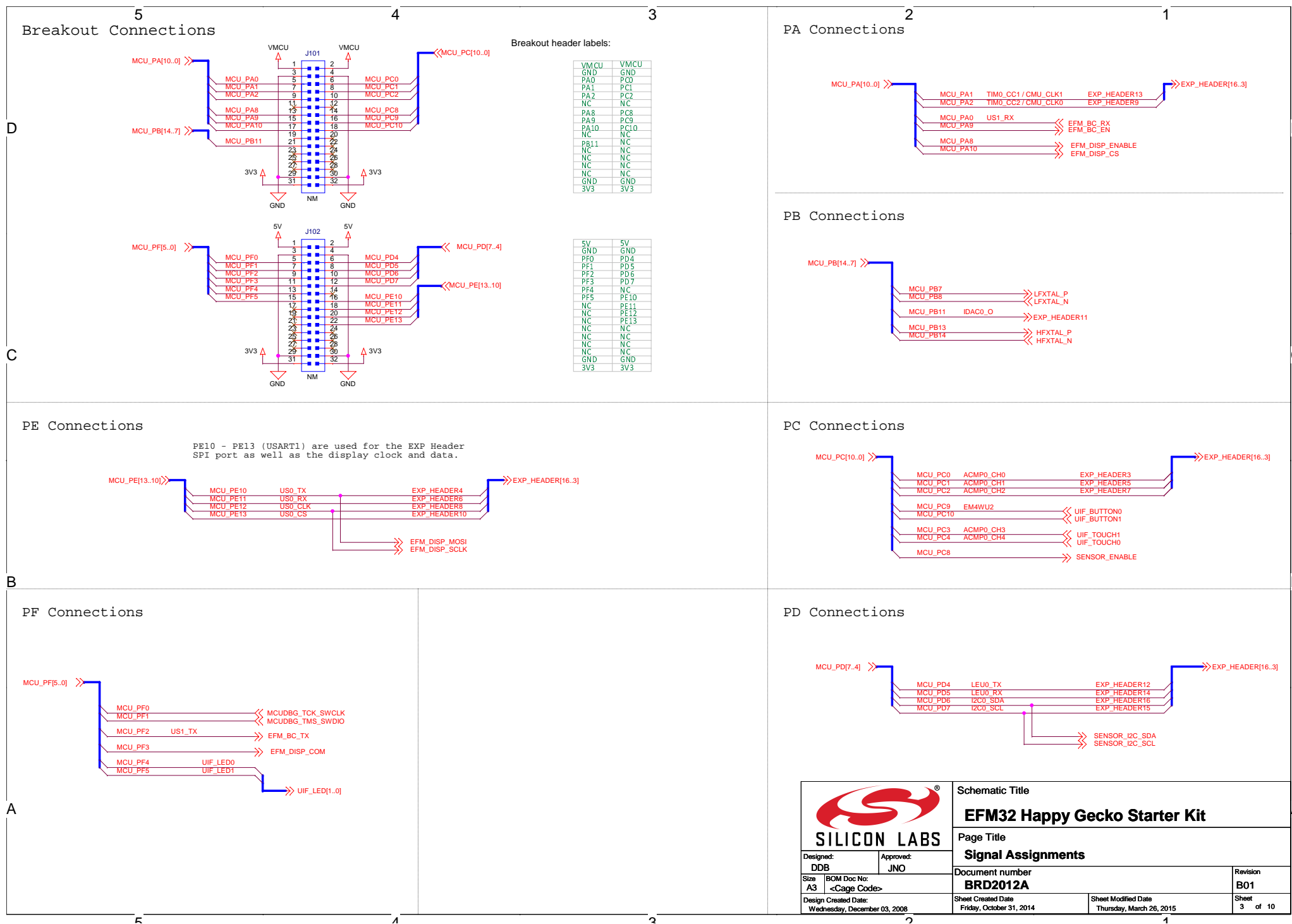
EFM32 HG STK

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		User Interfaces	
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		B01	
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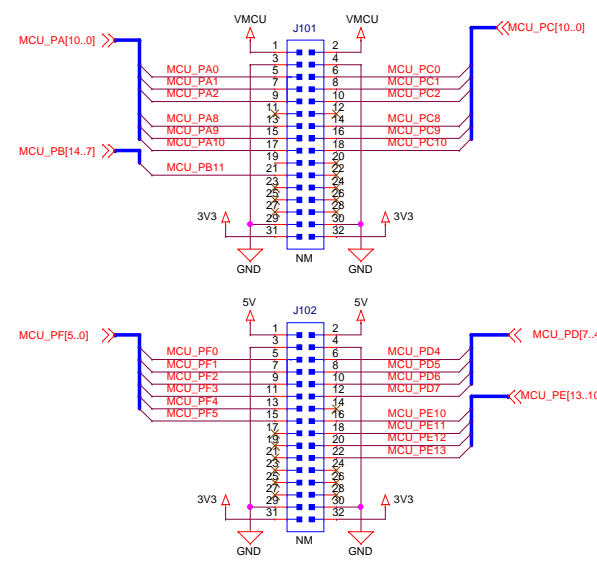
EFM_DISP_ENABLE	DISP_CTRL	VDISP	BC_DISP_AVAILABLE
1	EFM	VMCU	0
0	BC	BC_DISP_PWR_EN	1

The EFM32 always controls ownership of the display using the EFM_DISP_ENABLE signal.





Breakout Connections

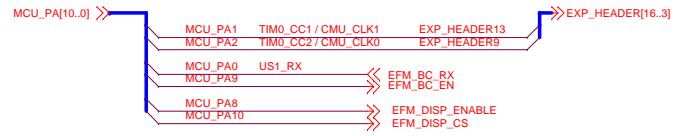


Breakout header labels:

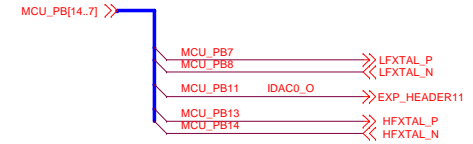
VMCU	VMCU
GND	GND
PA0	PC0
PA1	PC1
PA2	PC2
NC	NC
PA8	PC8
PA9	PC9
PA10	PC10
NC	NC
PB11	NC
NC	NC
NC	NC
NC	NC
NC	NC
NC	NC
GND	GND
3V3	3V3

5V	5V
GND	GND
PF0	PD4
PF1	PD5
PF2	PD6
PF3	PD7
PF4	NC
PF5	PE10
NC	PE11
NC	PE12
NC	PE13
NC	NC
NC	NC
NC	NC
NC	NC
GND	GND
3V3	3V3

PA Connections

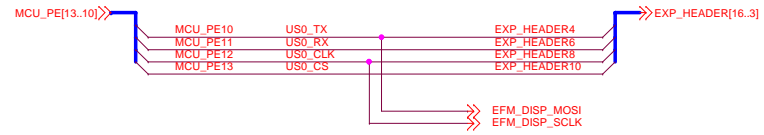


PB Connections

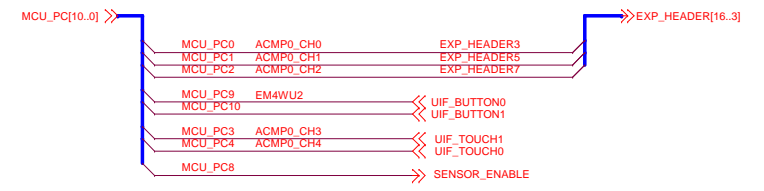


PE Connections

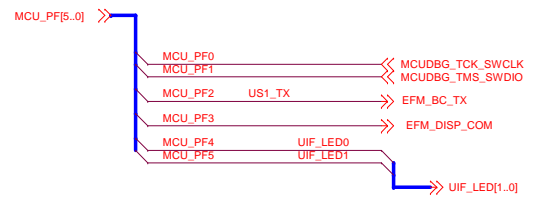
PE10 - PE13 (USART1) are used for the EXP Header SPI port as well as the display clock and data.



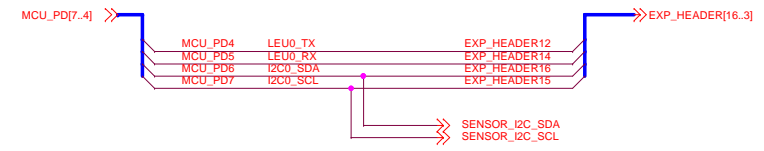
PC Connections



PF Connections

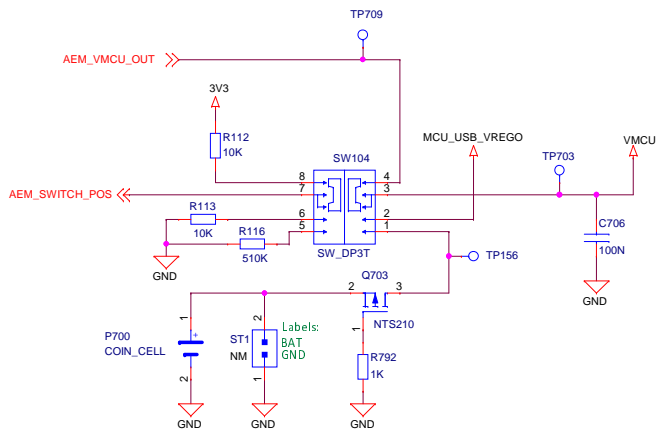


PD Connections



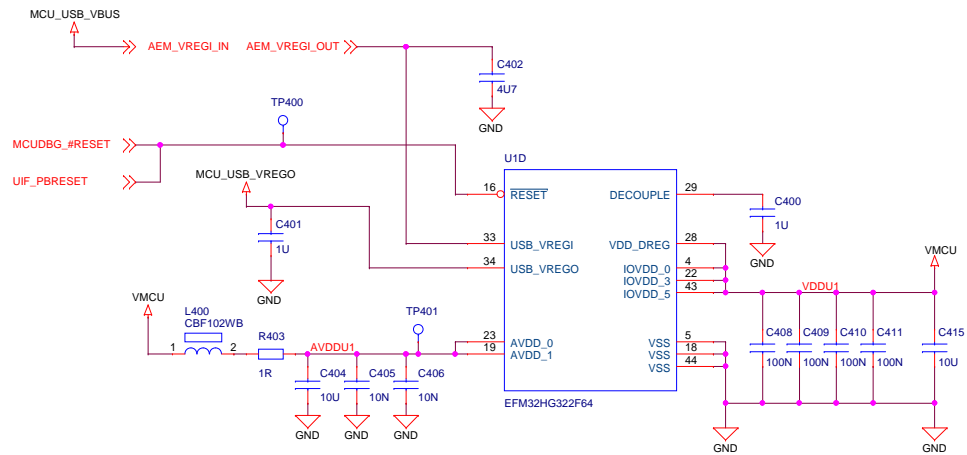
<p>SILICON LABS</p>	Schematic Title		
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	Signal Assignments		
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Power Select Switch: AEM/USB/BAT

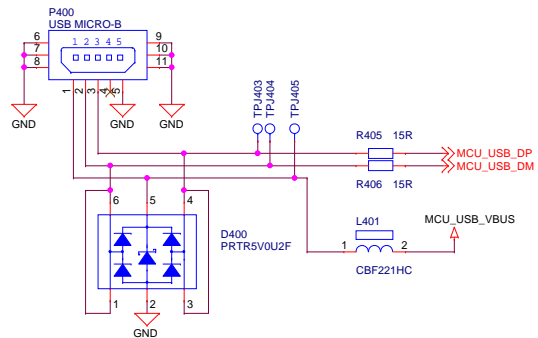



SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
USB	AEM Enabled, VMCU sourced from internal 3.3V LDO powered by MCU USB 5V supply
BAT	AEM Disabled, VMCU sourced from coin-cell battery or external power supply

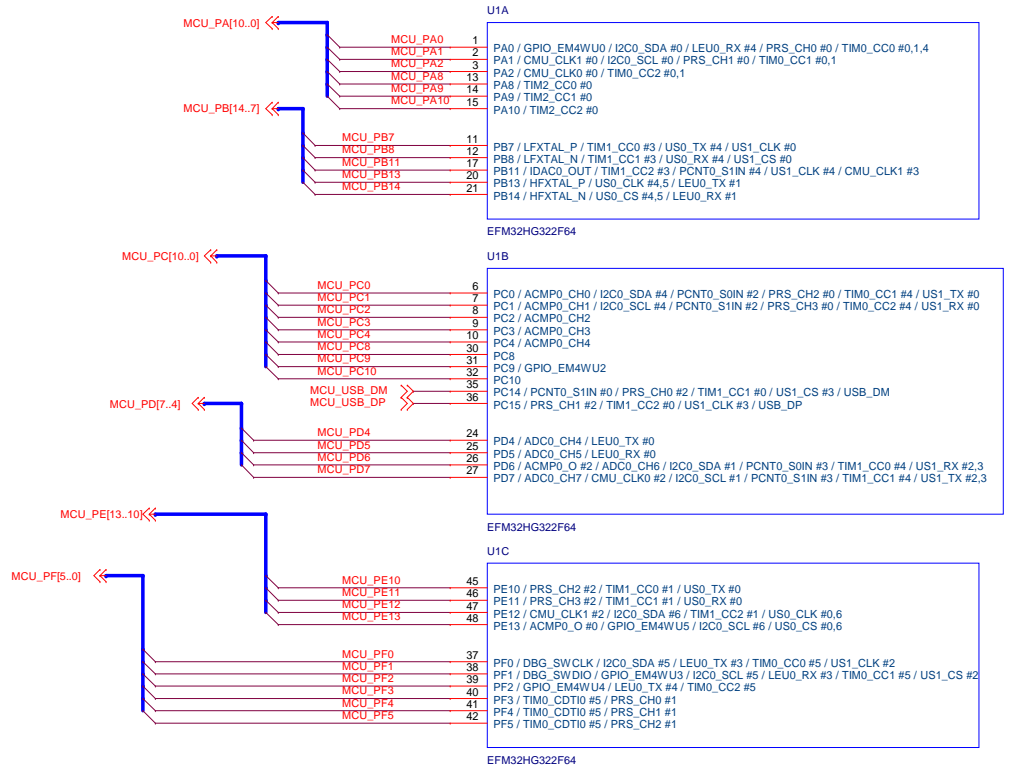
EFM32 Power and Decoupling



USB Connection and ESD Protection

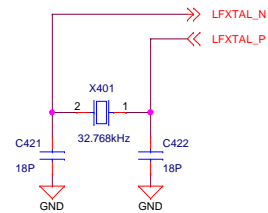
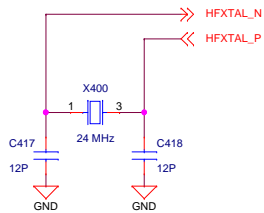


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		EFM32 Power & USB	
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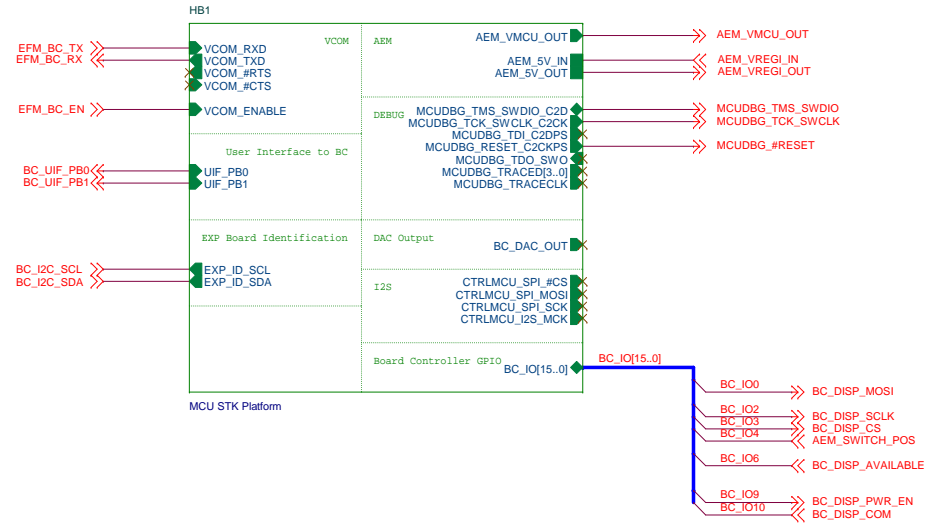
High Frequency Clock


Low Frequency Clock

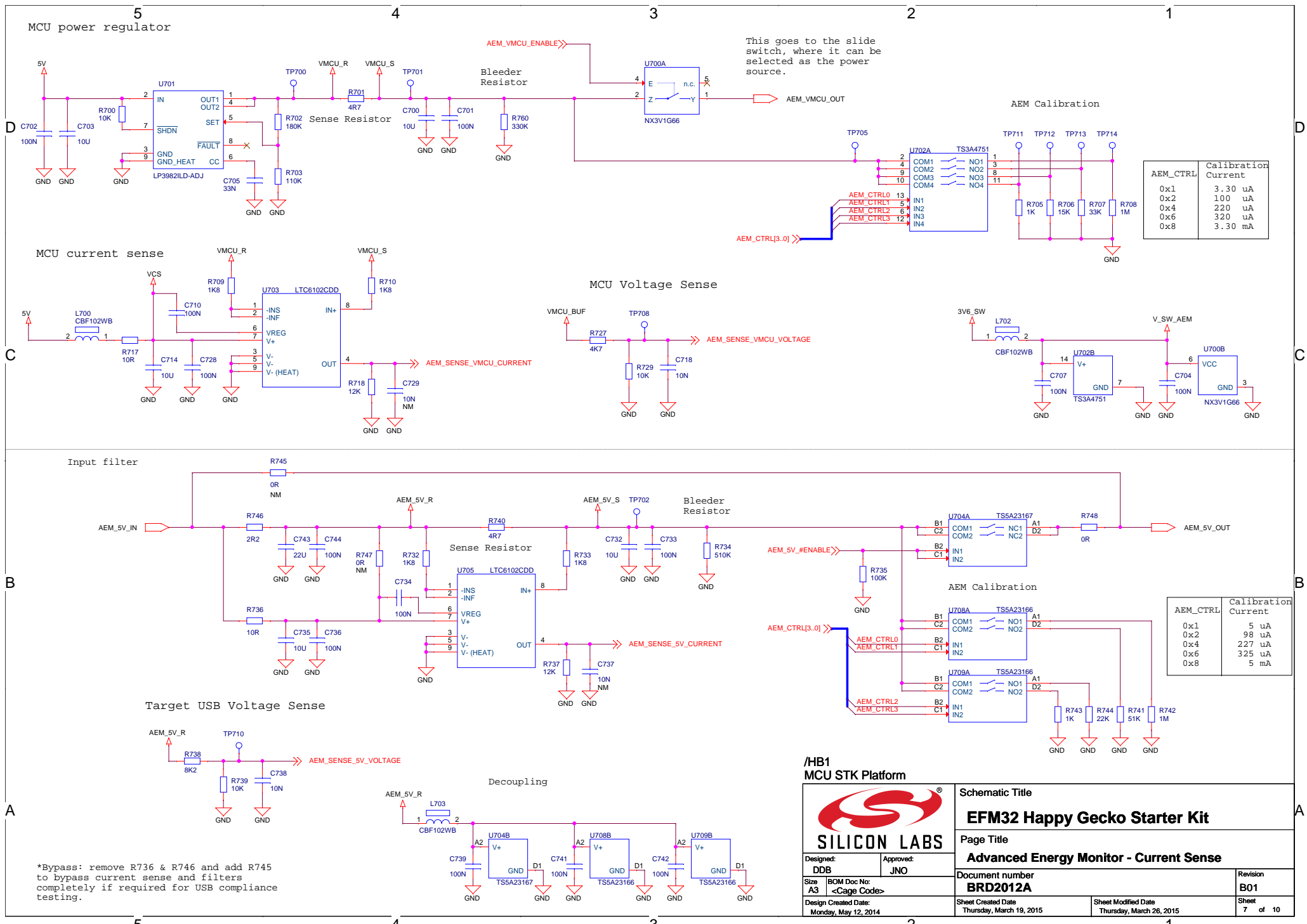


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Board Controller Functional Block



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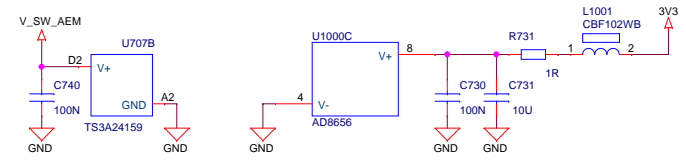
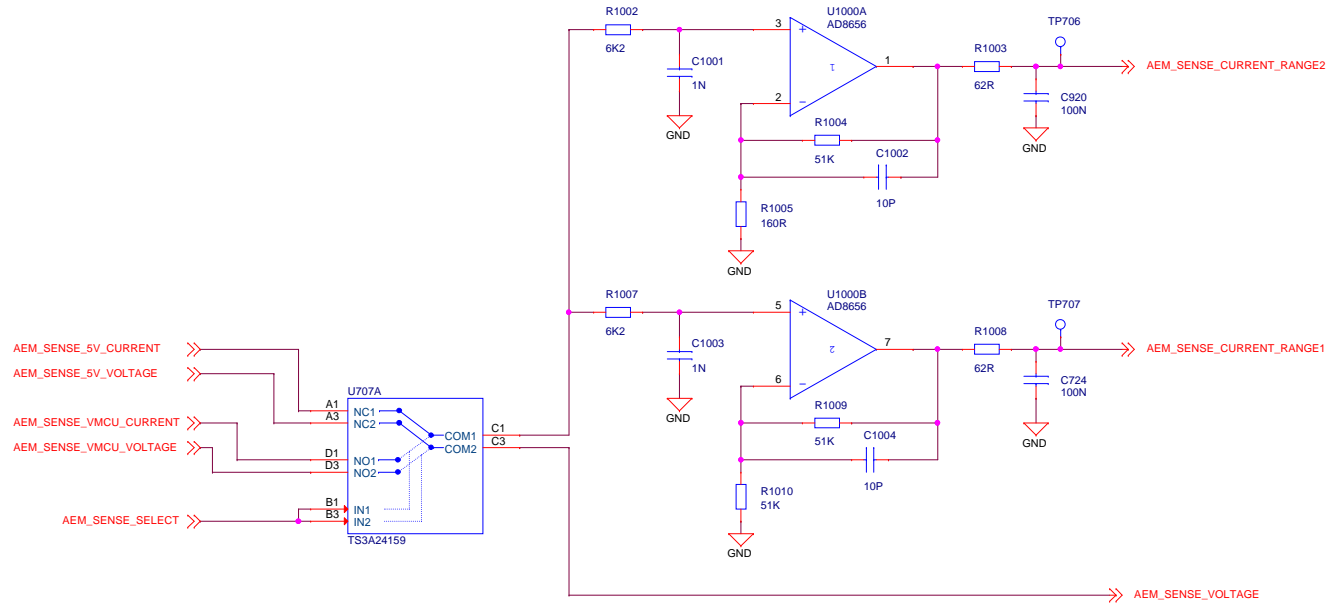


*Bypass: remove R736 & R746 and add R745 to bypass current sense and filters completely if required for USB compliance testing.

/HB1
MCU STK Platform



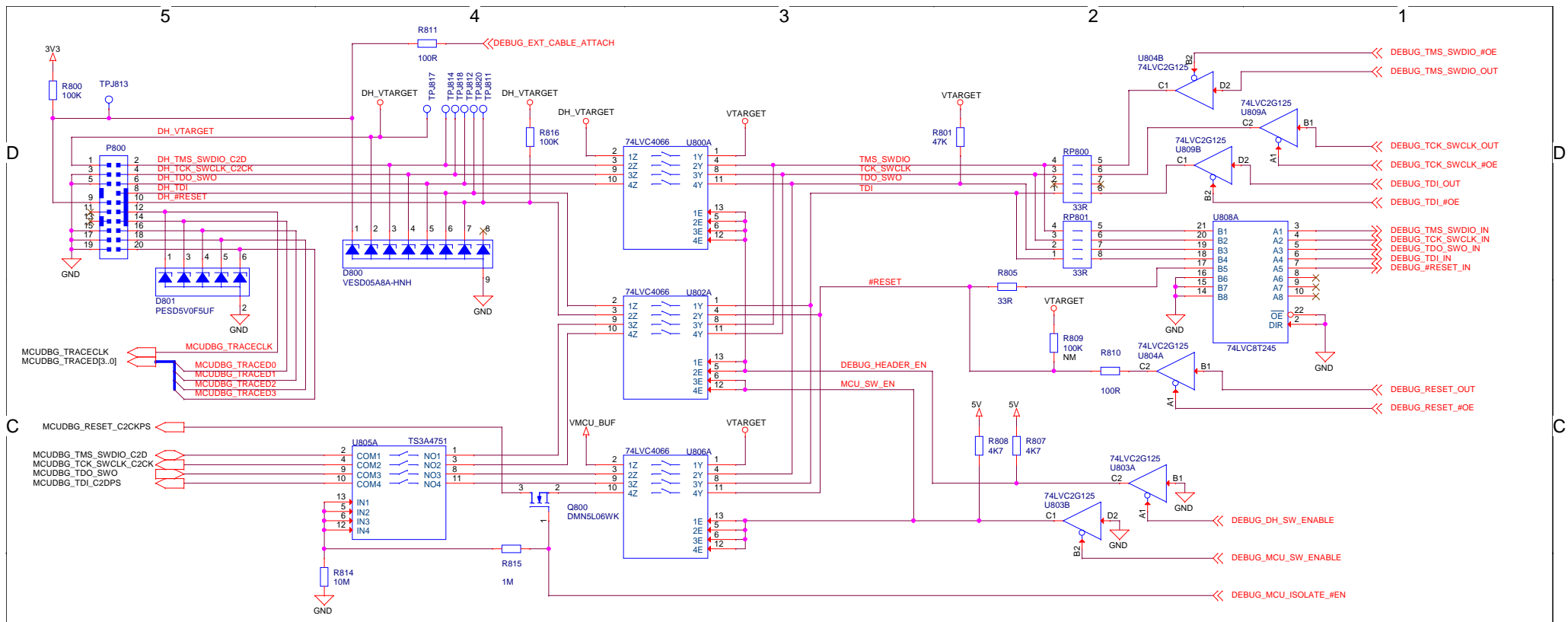
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Page Title		Advanced Energy Monitor - Current Sense	
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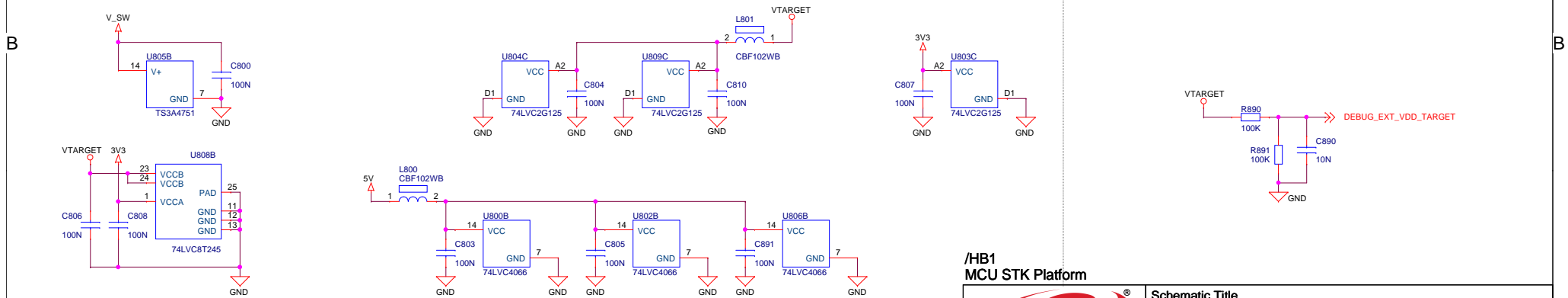
/HB1
MCU STK Platform



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Page Title		Advanced Energy Monitor - Gain Stages	
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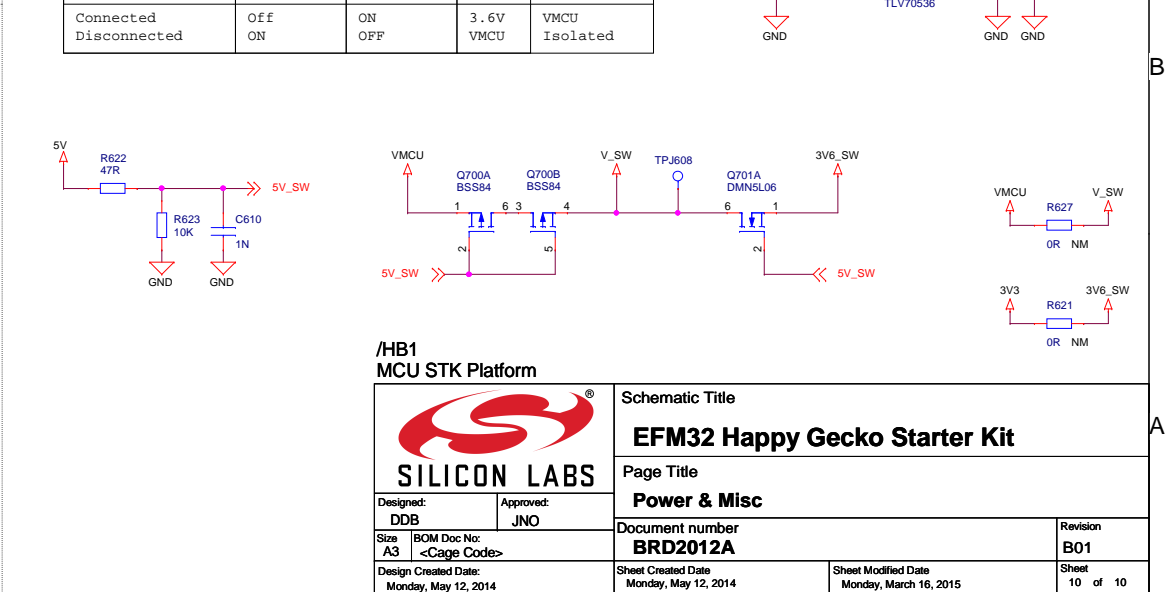
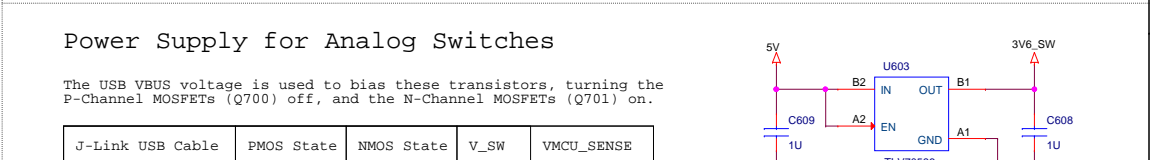
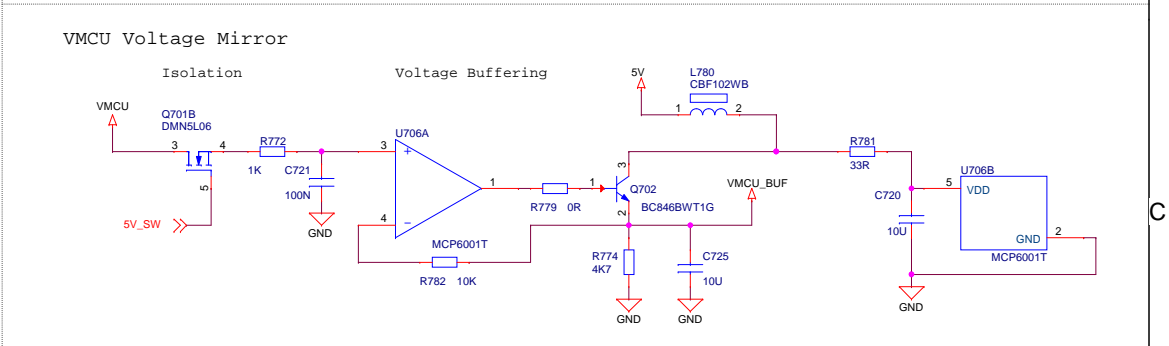
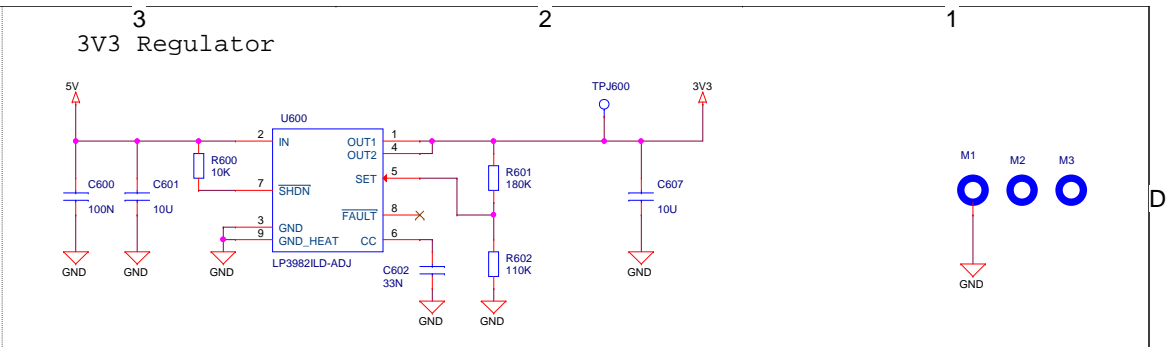
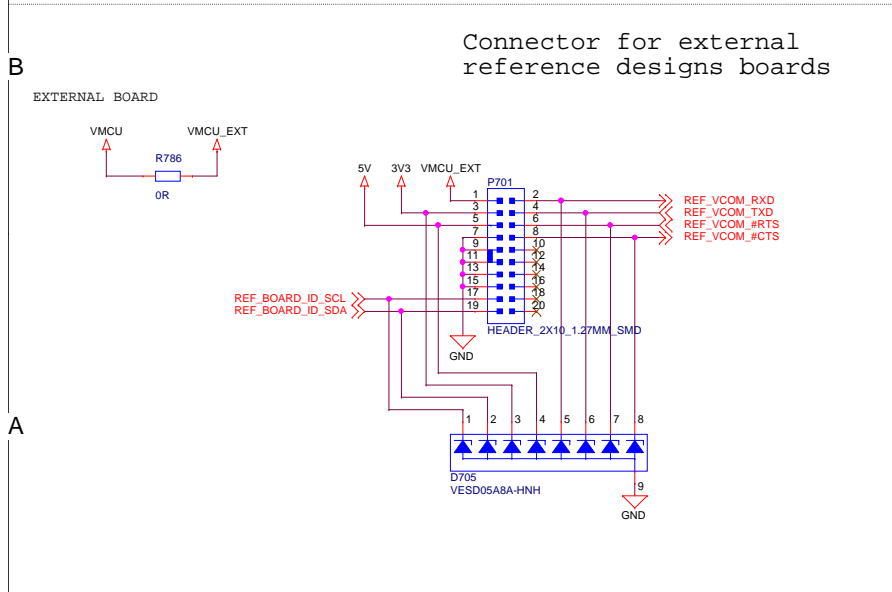
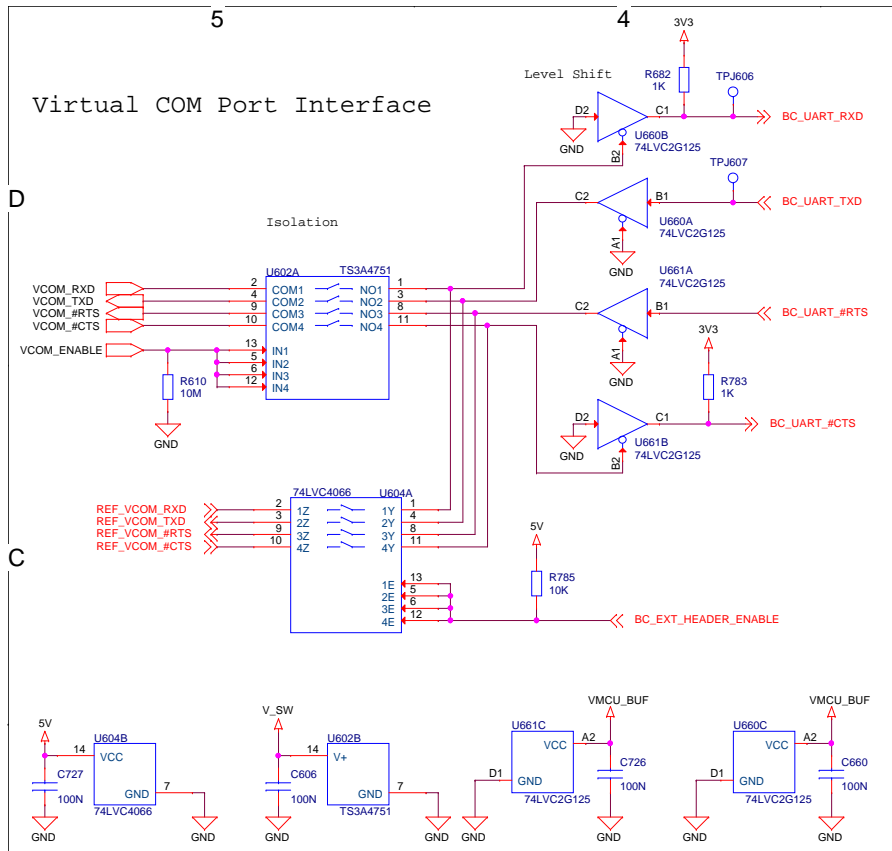
Power & Decoupling



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	-	-

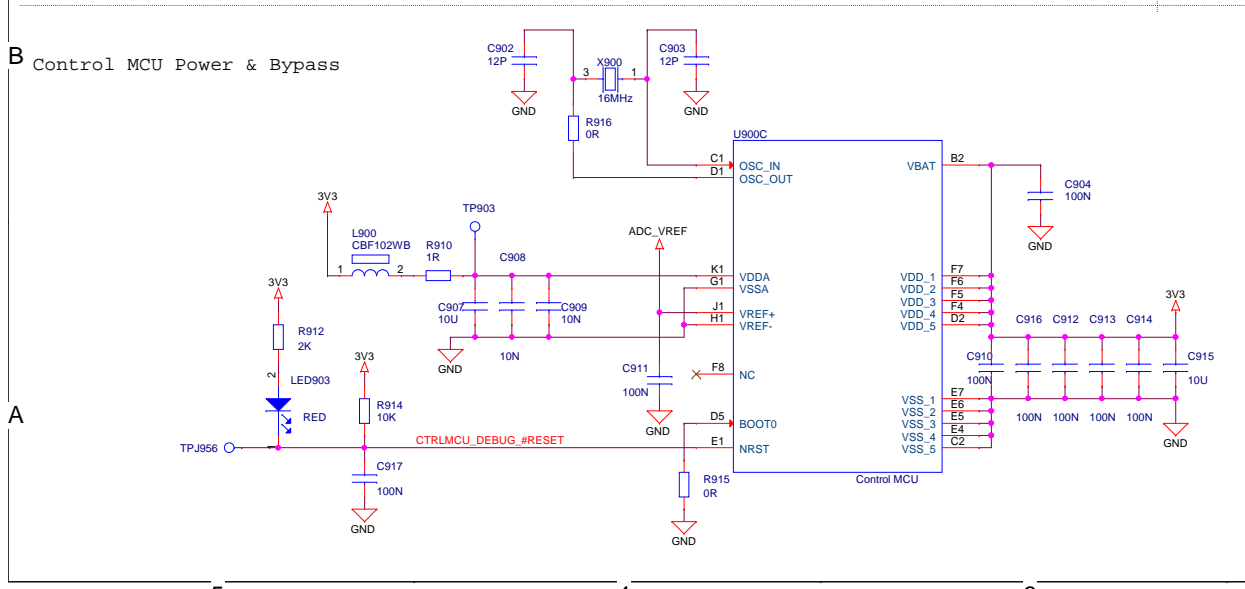
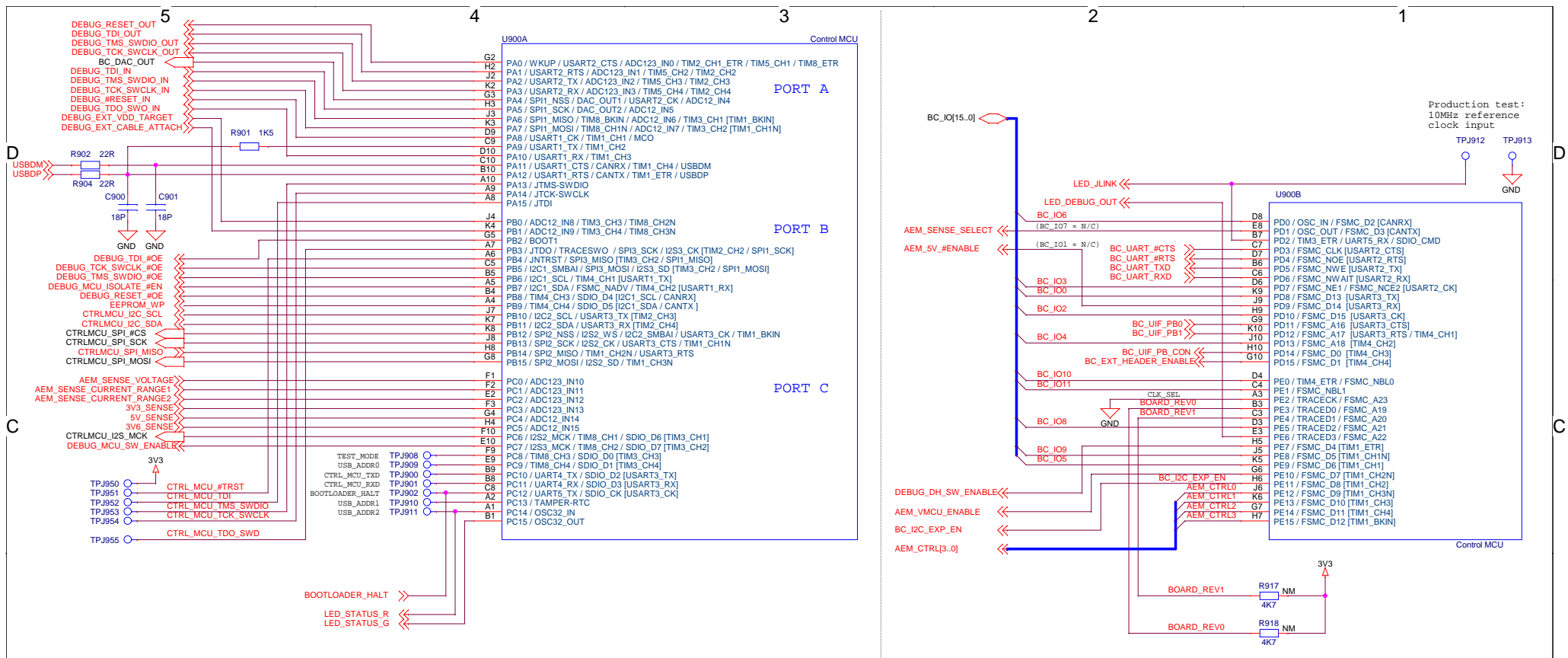
/HB1
MCU STK Platform

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/HB1
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Production test: 10MHz reference clock input

TPJ912 TPJ913

Control MCU (U900B) Pin Connections:

- 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_CK]; 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].

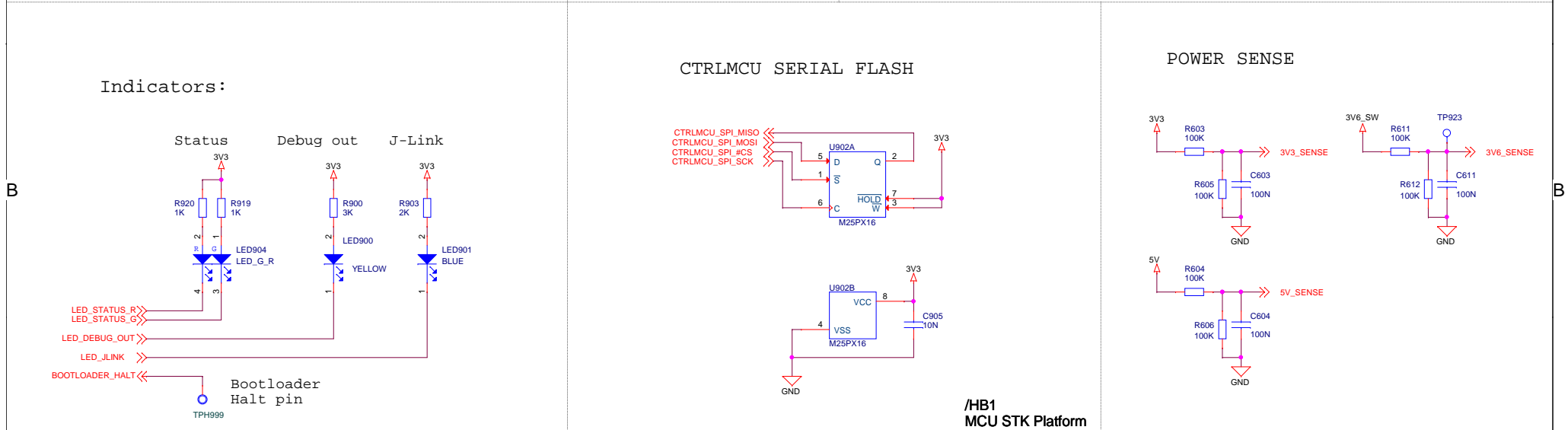
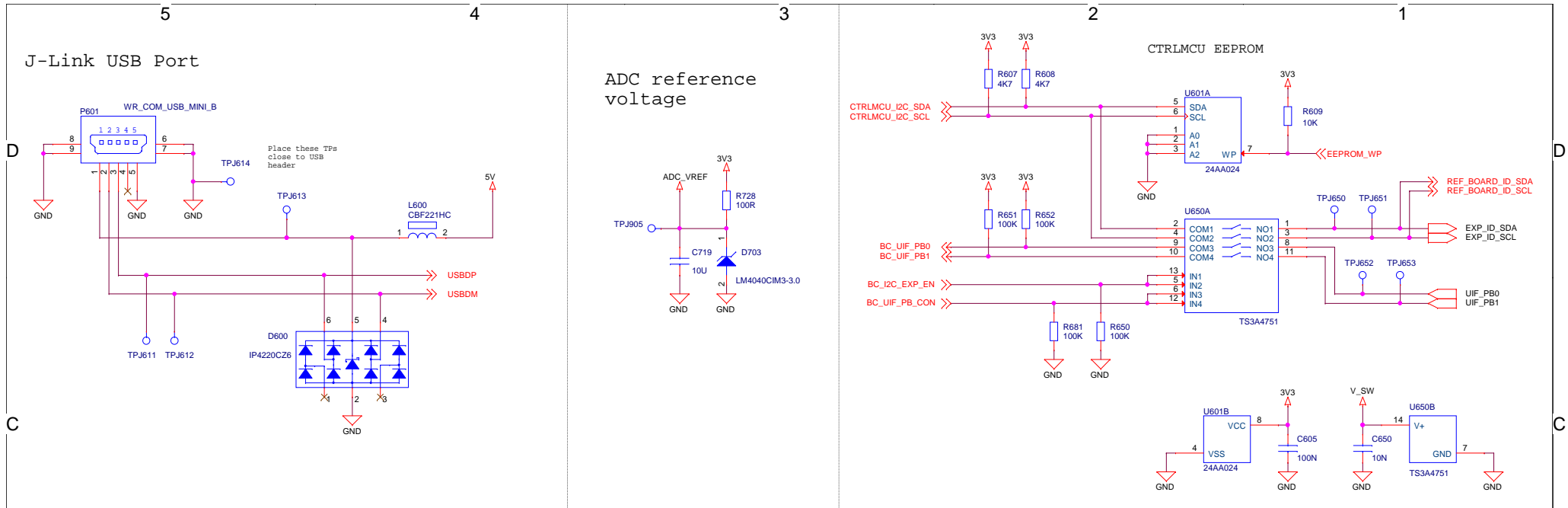
Other Connections:

- Debug: DEBUG_DH_SW_ENABLE, AEM_VMCU_ENABLE, BC_I2C_EXP_EN, AEM_CTRL[3..0].
- Power: 3V3.
- Board Rev: BOARD_REV1, BOARD_REV0.
- LED: LED_JLINK, LED_DEBUG_OUT.
- BC_IO[15..0], BC_IO6, BC_UART_#CTS, BC_UART_#RTS, BC_UART_#RXD, BC_UIF_PB0, BC_UIF_PB1, BC_EXT_HEADER_ENABLE, BC_I2C_EXP_EN, AEM_CTRL0, AEM_CTRL1, AEM_CTRL2, AEM_CTRL3.
- Test Points: TPJ912, TPJ913.

/HB1 MCU STK Platform

SILICON LABS

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