EFM32 Giant Gecko 11 STK

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Revision History

Rev.	Description
B00	Production release.

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EFM32GG11 STK

Designed: HEL	Approved: JNO	Schematic Title: EFM32 Giant Gecko 11 Starter Kit	
Size: A3	BOM Doc No: <Cage Code>	Page Title: Title Page	
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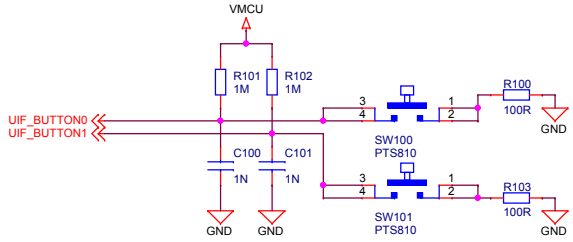
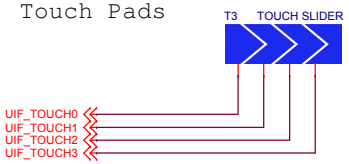
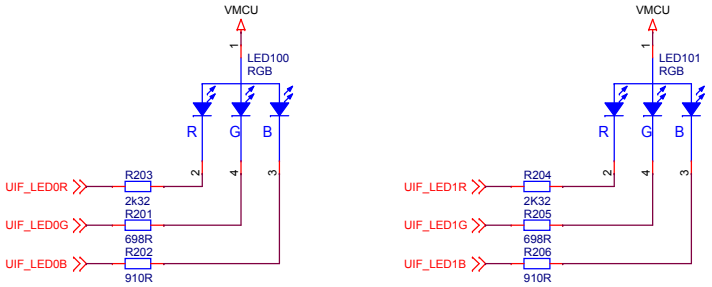
User Pushbuttons



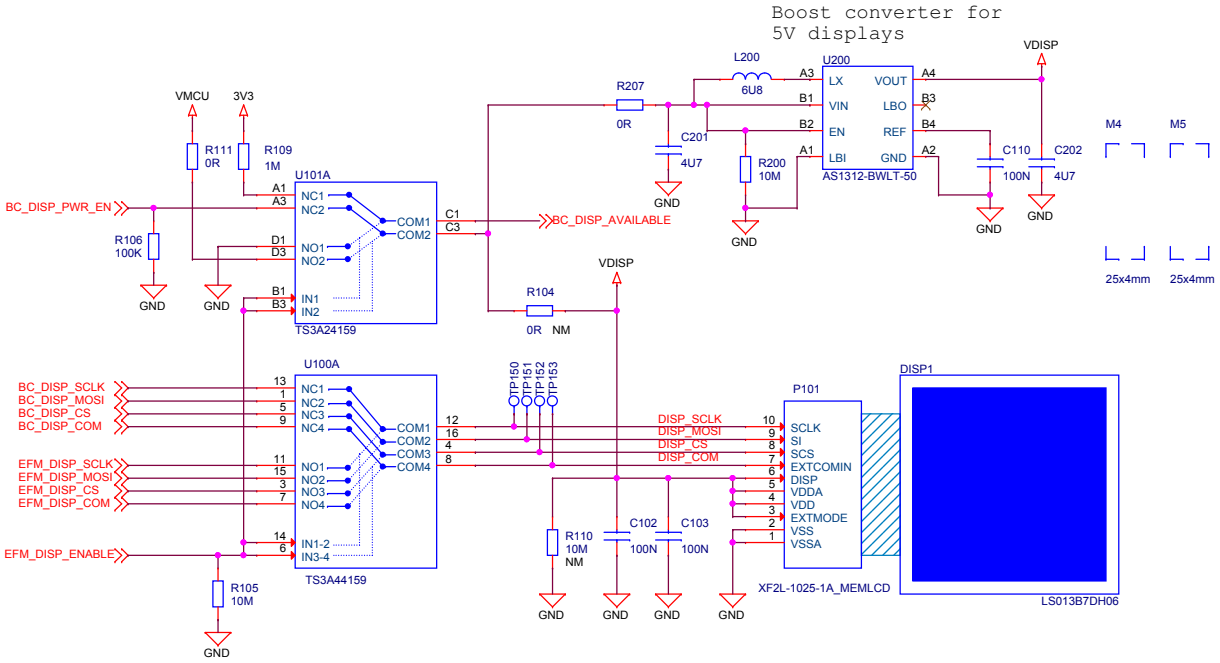
Touch Pads



User LEDs

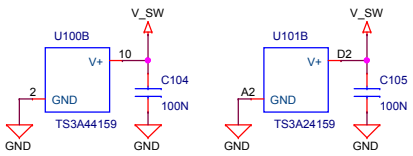


Memory LCD-TFT Display & Multiplexer

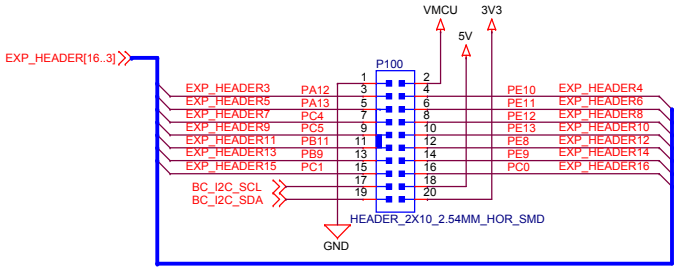


EFM_DISP_ENABLE	DISP_CTRL	VDISP	BC_DISP_AVAILABLE
1	EFM	VMCU	0
0	BC	BC_DISP_PWR_EN	1

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



EXP Header



EXP-Header Functionality

1	GND		
3	PA12	CAN1_RX #5	PCNT1_S0IN #5
5	PA13	CAN1_TX #5	PCNT1_S1IN #5
7	PC4	I2C1_SDA #0	SDIO_CD #1
9	PC5	I2C1_SCL#0	SDIO_WP #1
11	PB11	DAC0_OUT0	
13	PB9		
15	PC1	I2C0_SCL #4	CAN0_TX #0
17	Reserved for EXP Board Identification		
19	Reserved for EXP Board Identification		

2	VMCU		
4	PE10	US0_TX #0	SDIO_DAT1 #0
6	PE11	US0_RX#0	SDIO_DAT0 #0
8	PE12	US0_CLK#0	SDIO_CMD #0
10	PE13	US0_CS#0	SDIO_CLK #0
12	PE8	US5_TX #0	SDIO_DAT3 #0
14	PE9	US5_RX #0	SDIO_DAT2 #0
16	PC0	I2C0_SDA #4	CAN0_RX #0
18	5V		
20	3V3		

EFM32GG11 STK

SILICON LABS

Designed: HEL	Approved: JNO
Size A3	BOM Doc No:
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Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**

Page Title: **User Interfaces**

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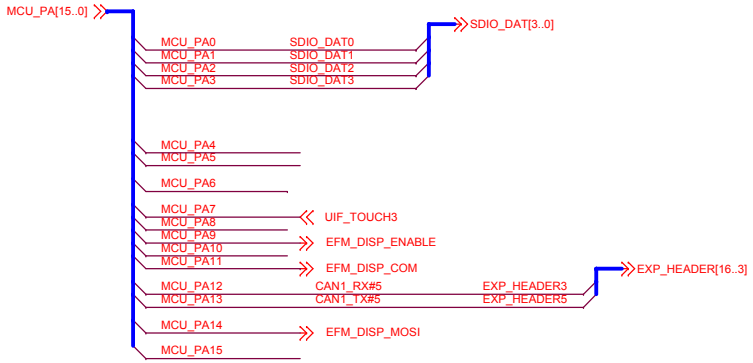
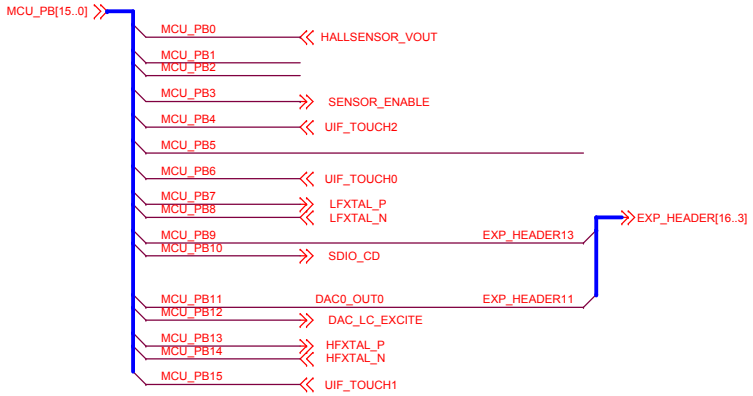
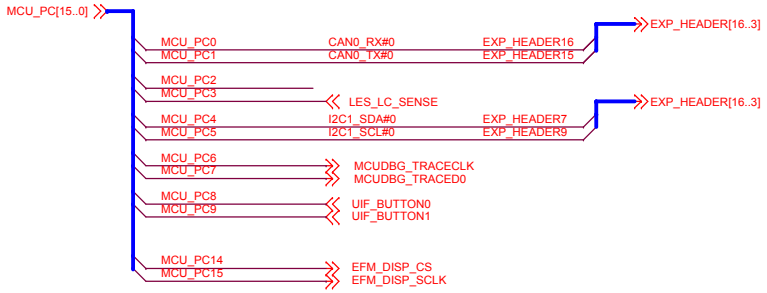
PA Connections



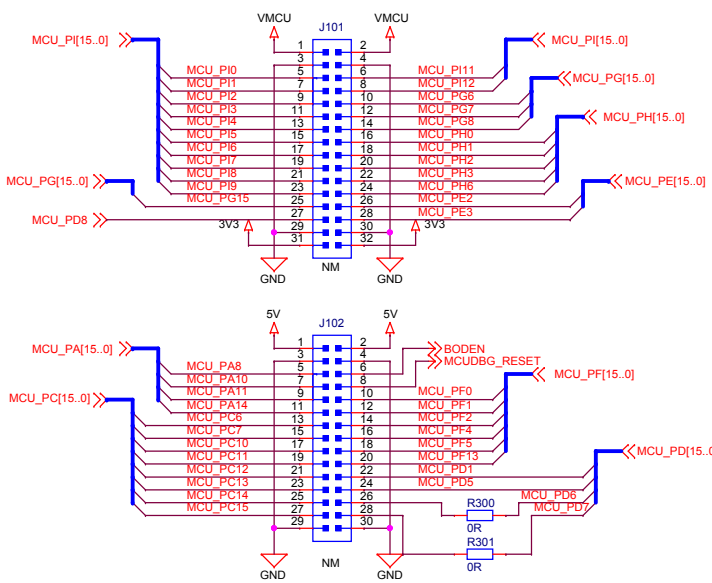
PB Connections



PC Connections



Breakout Connections



Breakout header labels:

VMCU	VMCU
GND	GND
I0	I11
I1	I12
I2	G6
I3	G7
I4	G8
I5	H0
I6	H1
I7	H2
I8	H3
I9	H6
G15	E2
D8	E3
GND	GND
3V3	3V3

5V	5V
GND	GND
A8	BDEN
A10	RST
A11	F0
A14	F1
C6	F2
C7	F4
C10	F5
C11	F13
C12	D1
C13	D5
C14	D6
C15	D7
GND	GND

SILICON LABS

Designed: HEL	Approved: JNO
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Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**

Page Title: **EFM32 Signal Assignments**

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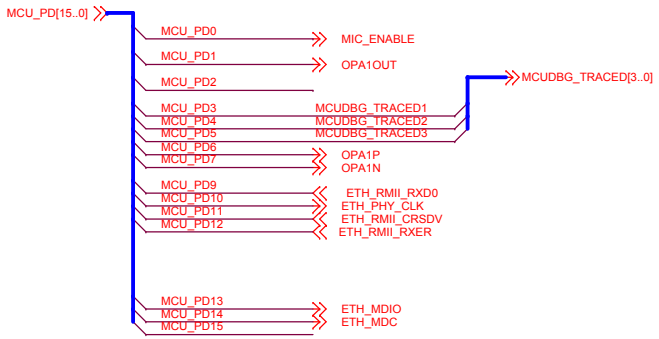
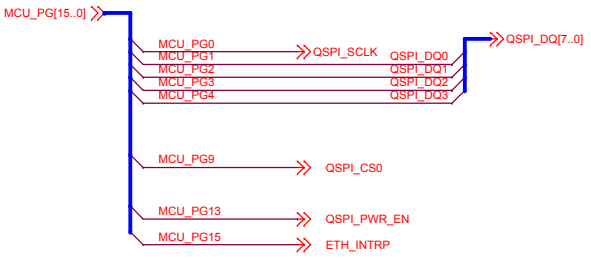
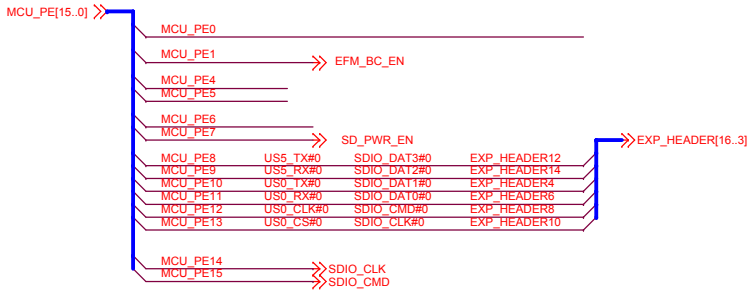
PD Connections



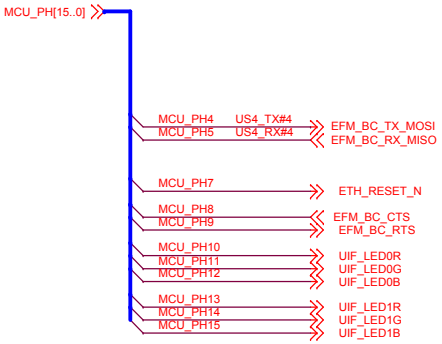
PG Connections



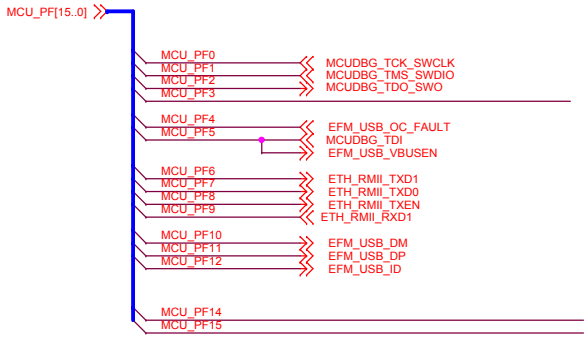
PE Connections



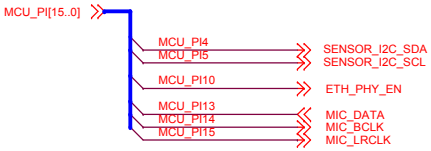
PH Connections



PF Connections



PI Connections



SILICON LABS

Designed: HEL	Approved: JNO
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Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**

Page Title: **EFM32 Signal Assignments**

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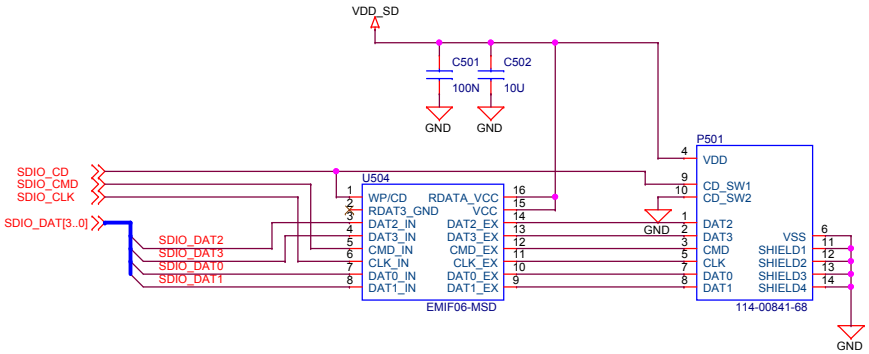
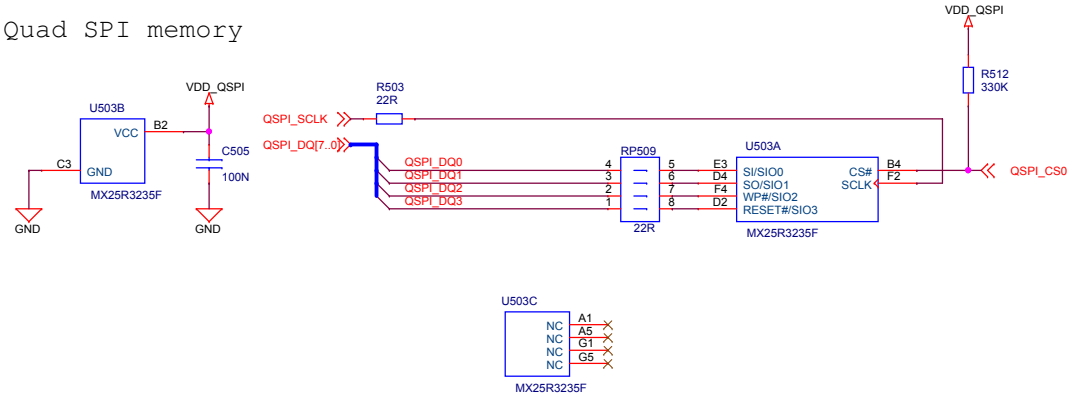
SDIO micro

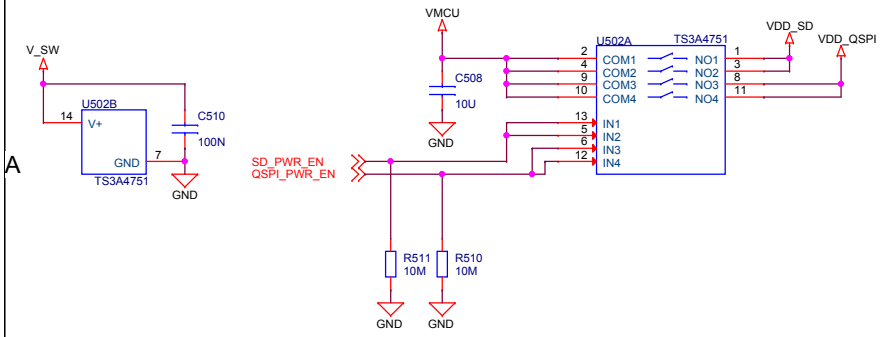
SDIO slot is connected to
SDIO location #0



Quad SPI memory



External memory power switch



EFM32GG11 STK

SILICON LABS

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

Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**

Page Title: **External memory interfaces**

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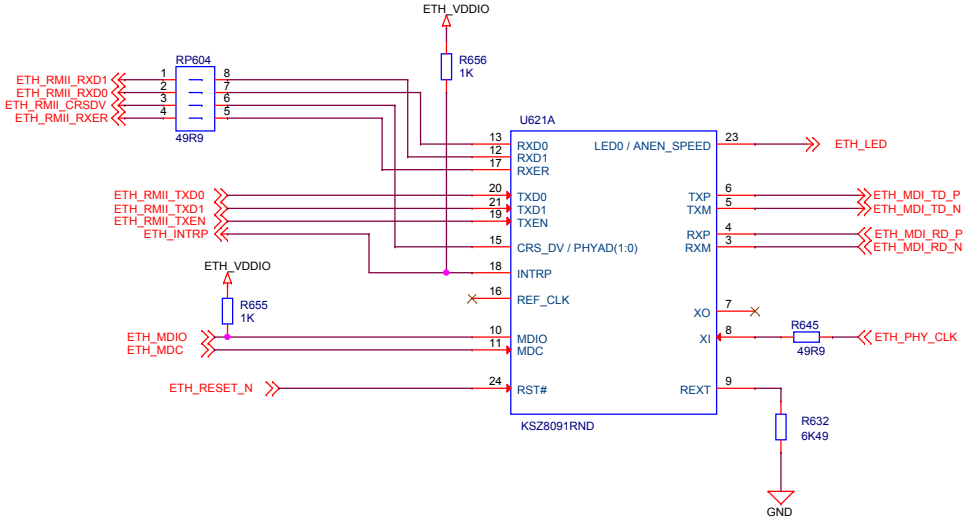
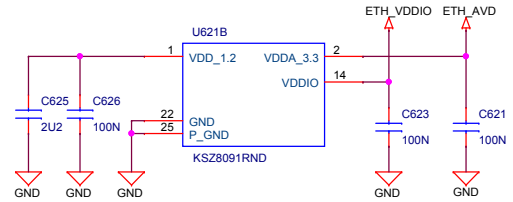
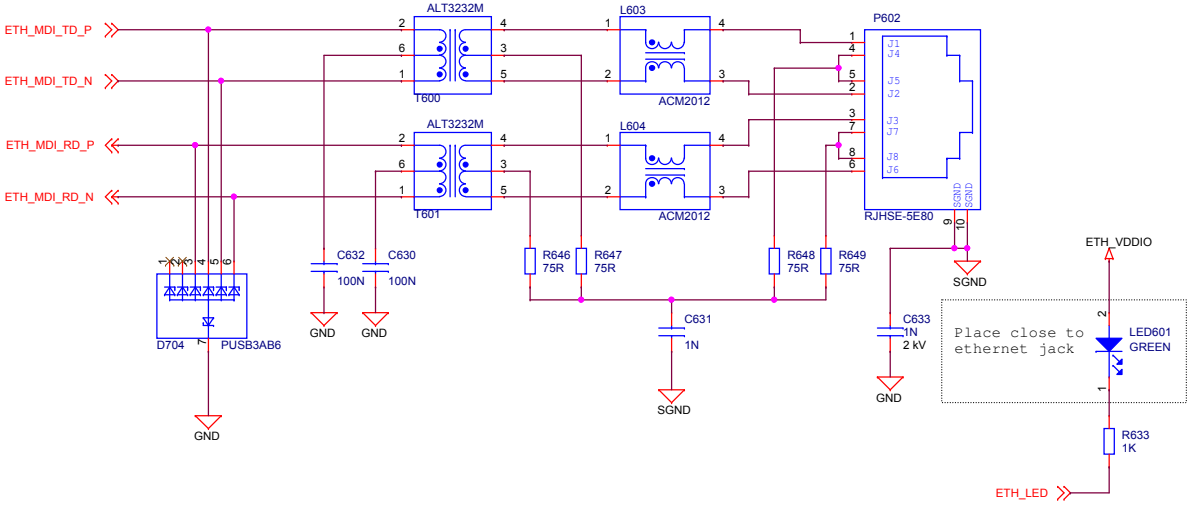
Ethernet PHY

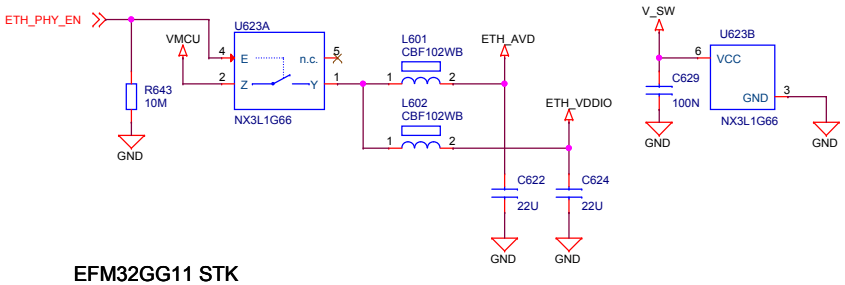
ETH RMII is connected to
EFM32 Ethernet location #1





Ethernet jack





EFM32GG11 STK

SILICON LABS

Designed: HEL	Approved: JNO	Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**	
Size: A3	BOM Doc No:	Page Title: **Ethernet PHY**	
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		Sheet Created Date: Tuesday, October 25, 2016	Sheet Modified Date: Tuesday, April 18, 2017
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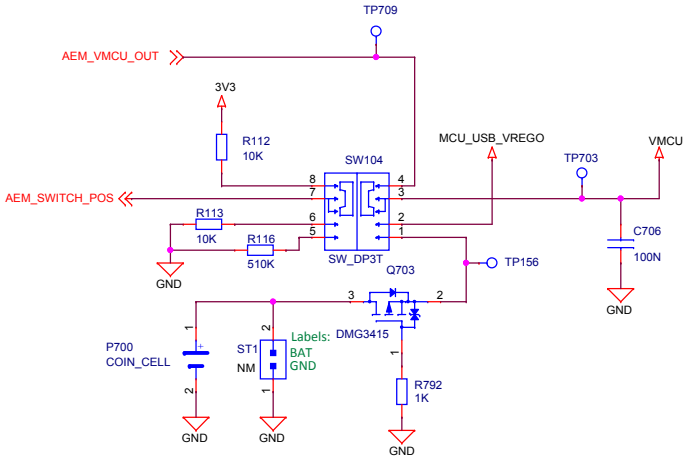
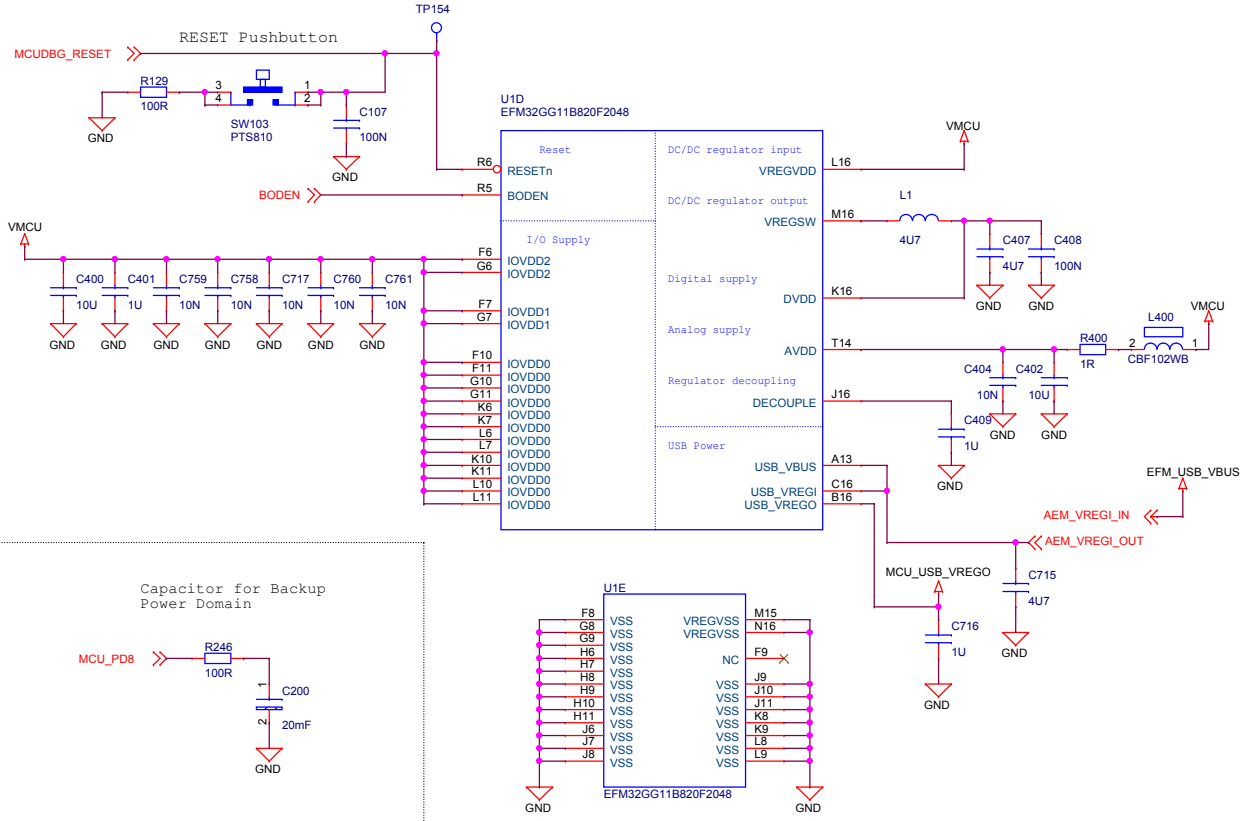
Power Select Switch: AEM/USB/BAT



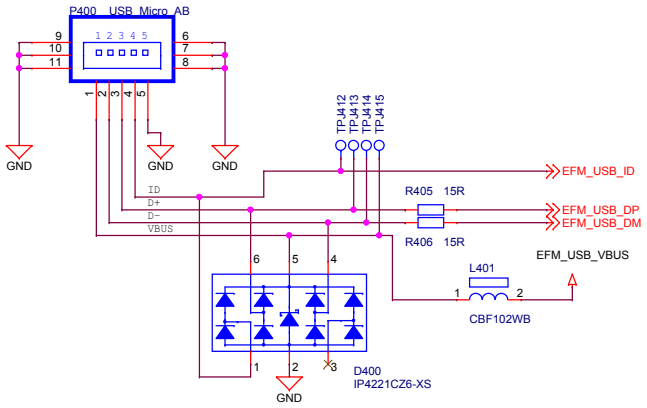
SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
USB	AEM Enabled. VMCU sourced from internal 3.3V LDO powered by MCU USB 5V supply
BAT	AEM Disabled, VMCU sourced from coin-cell battery or external power supply

EFM32 Power and Decoupling

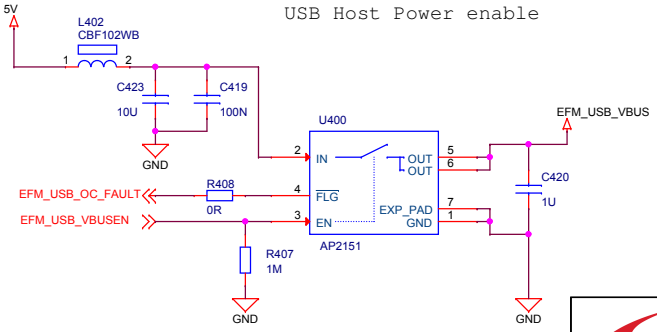


Capacitor for Backup Power Domain

USB Connection and ESD protection



USB Host Power enable



SILICON LABS

Schematic Title	EFM32 Giant Gecko 11 Starter Kit
Page Title	EFM32 Power & USB
Designed: HEL	Approved: JNO
Size: A3	BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008	
Document number: BRD2204A	Revision: B00
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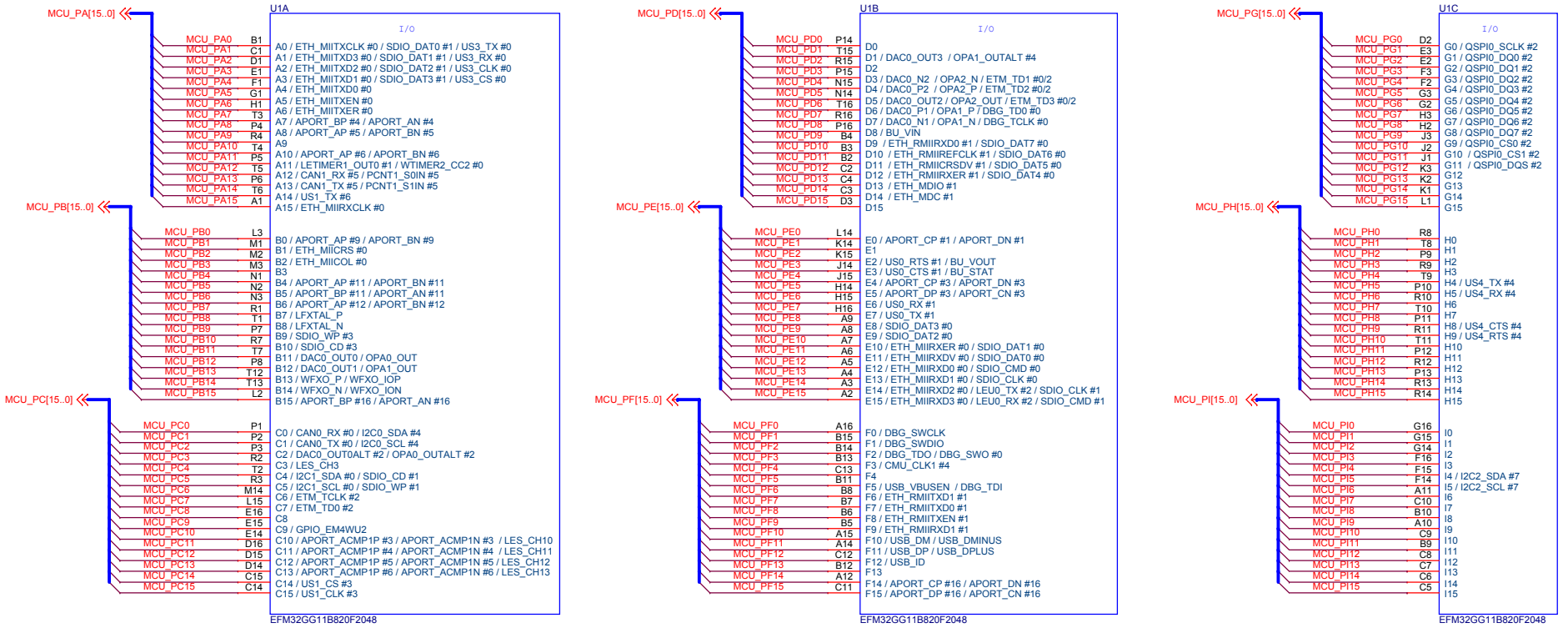
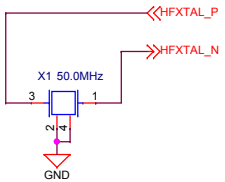
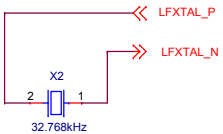
EFM32 GG11 MCU



High Frequency Clock



Low Frequency Clock



SILICON LABS

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Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**

Page Title: **EFM32 I/O**

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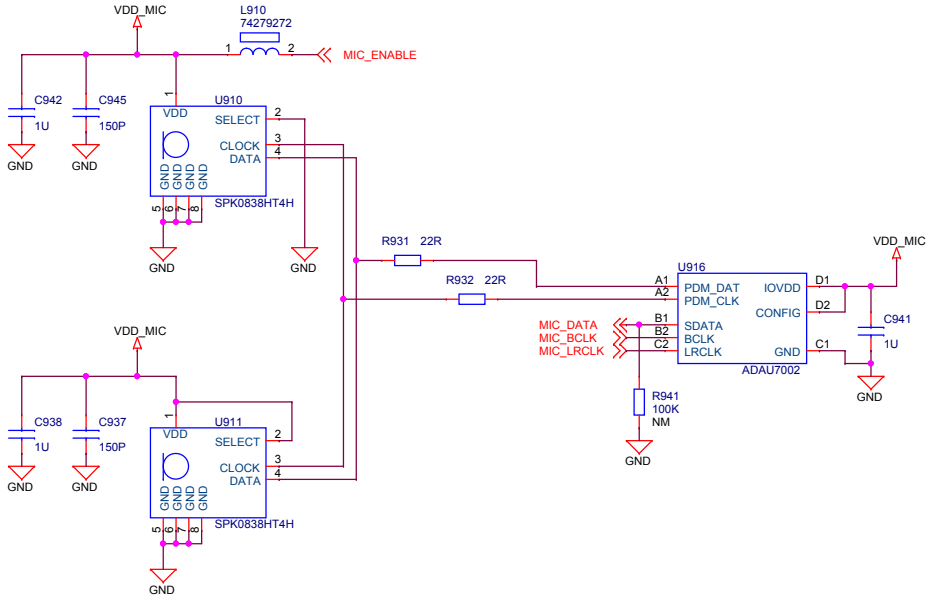
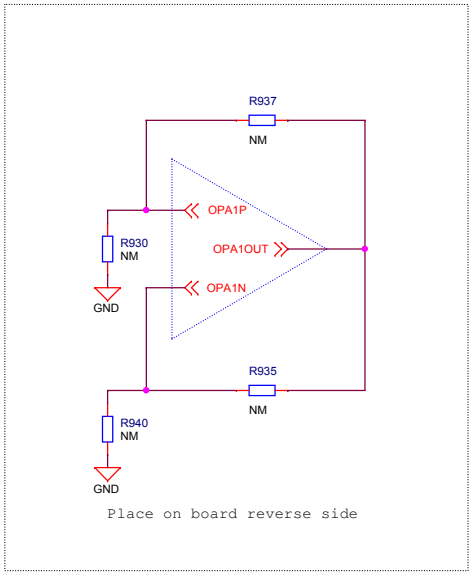
Stereo microphones





SILICON LABS	Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**	
	Page Title: **Stereo Microphones**	
Designed: HEL / Approved: JNO	Document number: **BRD2204A**	Revision: B00
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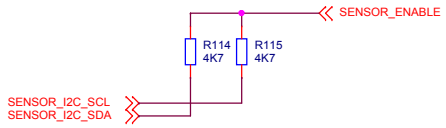
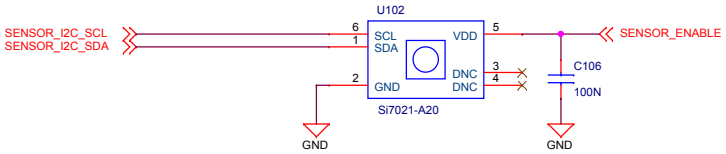
Design Created Date: Wednesday, December 03, 2008	Sheet Created Date: Monday, October 31, 2016 / Sheet Modified Date: Tuesday, April 18, 2017	Sheet 9 of 16

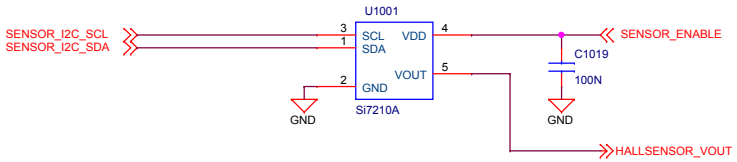
I2C Sensor pull-ups



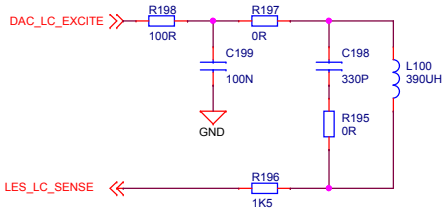
Relative Humidity & Temperature Sensor



Hall-effect sensor



LESENSE LC-Sensor



SILICON LABS		Schematic Title: **EFM32 Giant Gecko 11 Starter Kit**	
		Page Title: **Sensors**	
Designed: HEL	Approved: JNO	Document number: **BRD2204A**	Revision: B00
Size: A3	BOM Doc No: <Cage Code>		
Design Created Date: Wednesday, December 03, 2008		Sheet Created Date: Monday, November 14, 2016	Sheet Modified Date: Tuesday, April 18, 2017
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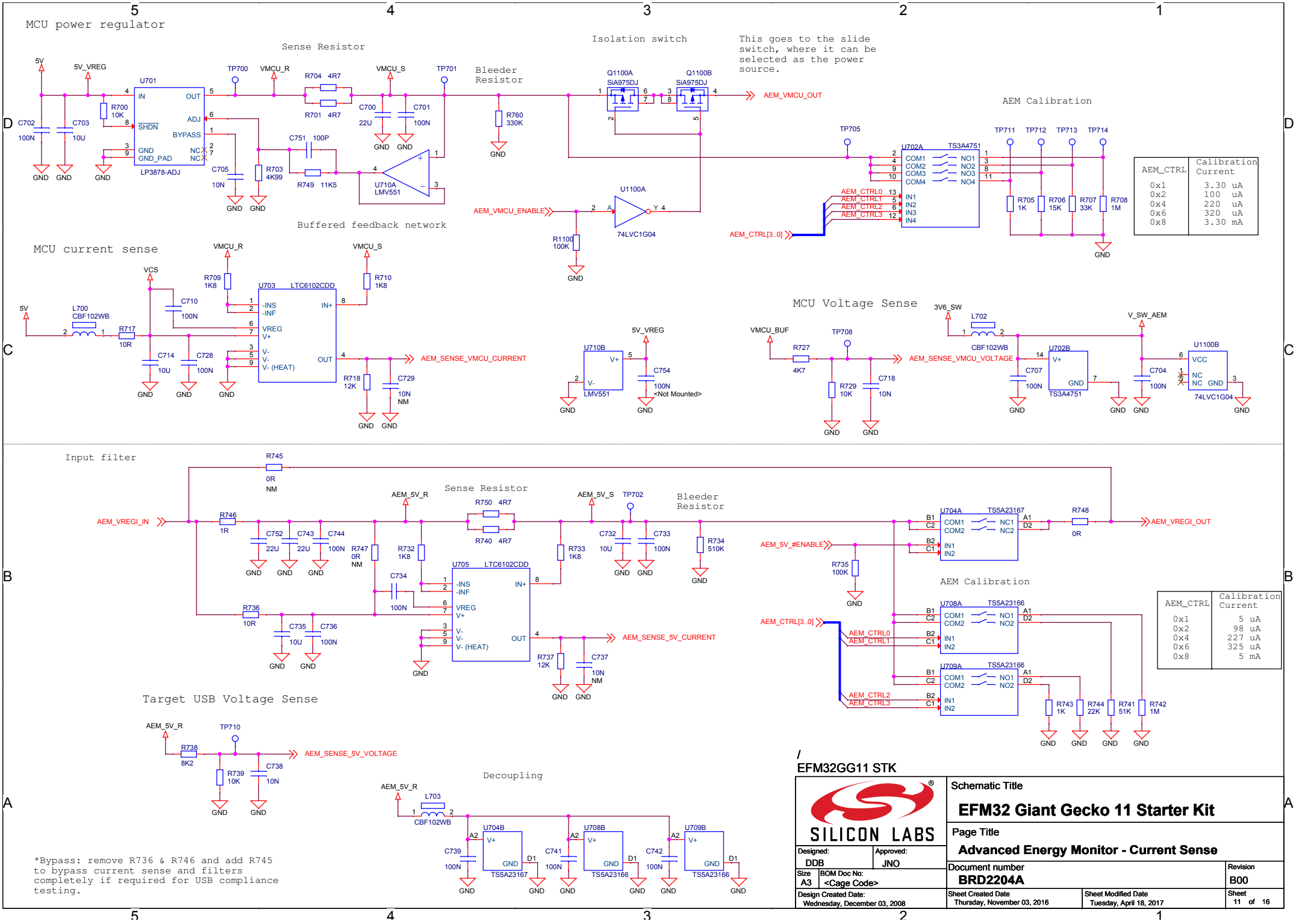
MCU power regulator
Sense Resistor
Isolation switch
This goes to the slide switch, where it can be selected as the power source.
Bleeder Resistor
AEM Calibration
Buffered feedback network
MCU current sense
MCU Voltage Sense
Input filter
Sense Resistor
Bleeder Resistor
AEM Calibration
Target USB Voltage Sense
Decoupling
*Bypass: remove R736 & R746 and add R745 to bypass current sense and filters completely if required for USB compliance testing.
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EFM32GG11 STK
SILICON LABS
Schematic Title
EFM32 Giant Gecko 11 Starter Kit
Page Title
Advanced Energy Monitor - Current Sense
Designed: DDB
Approved: JNO
Size A3
BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008
Document number BRD2204A
Revision B00
Sheet Created Date Thursday, November 03, 2016
Sheet Modified Date Tuesday, April 18, 2017
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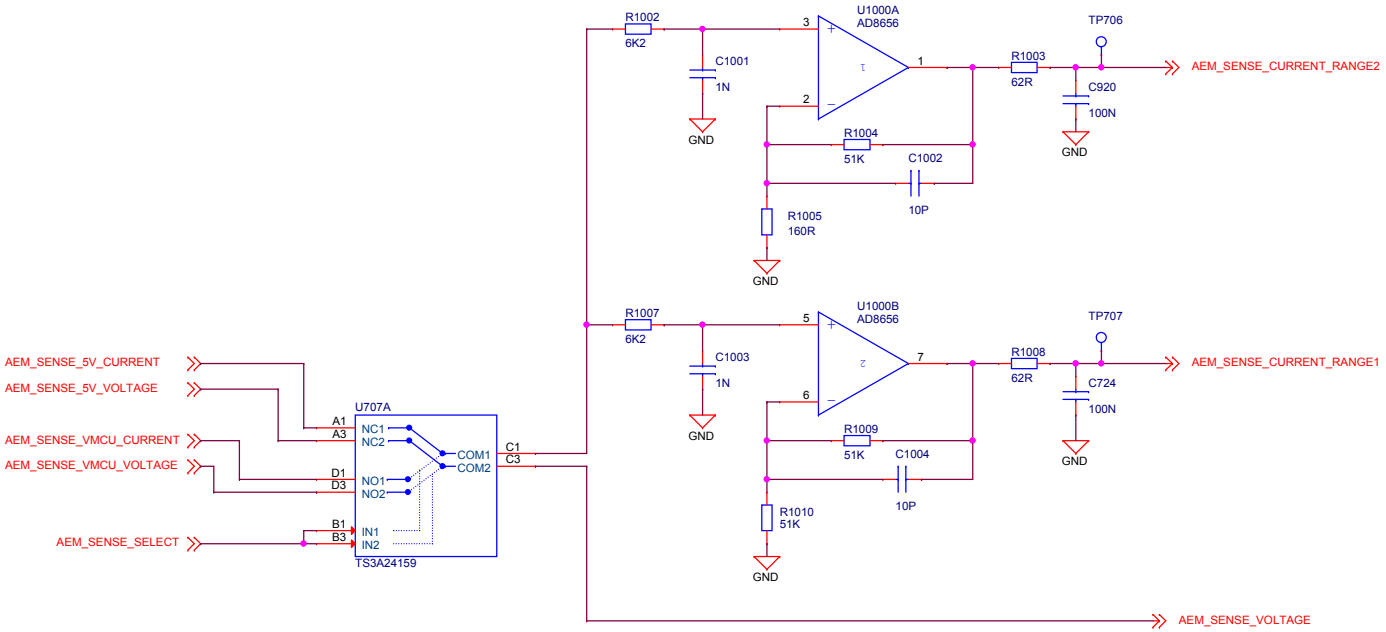

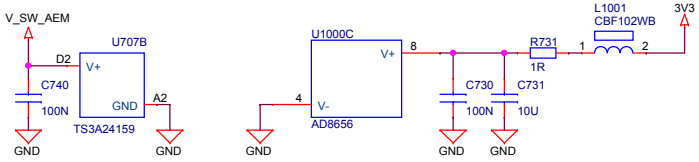

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EFM32GG11 STK

SILICON LABS

Schematic Title
EFM32 Giant Gecko 11 Starter Kit

Page Title
Advanced Energy Monitor - Gain Stages

Designed: DDB	Approved: JNO	Document number BRD2204A	Revision B00
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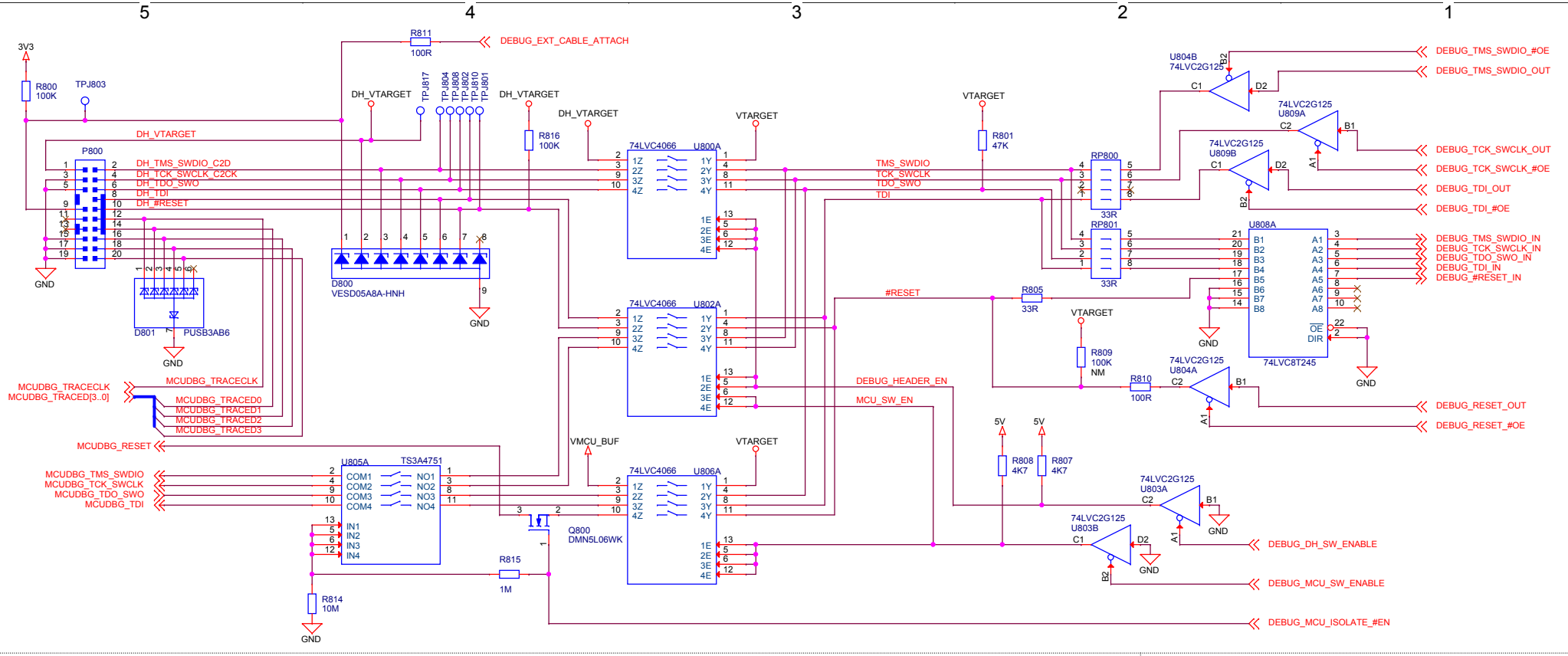
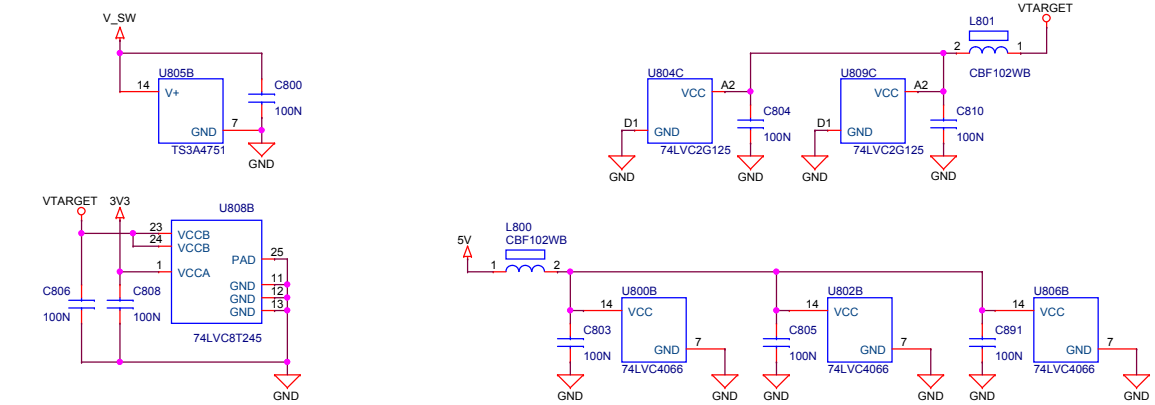
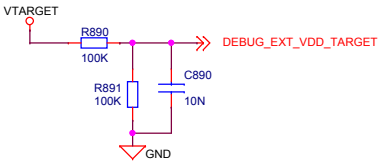


Power & Decoupling





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	-	-

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Schematic Title
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Debug Interface

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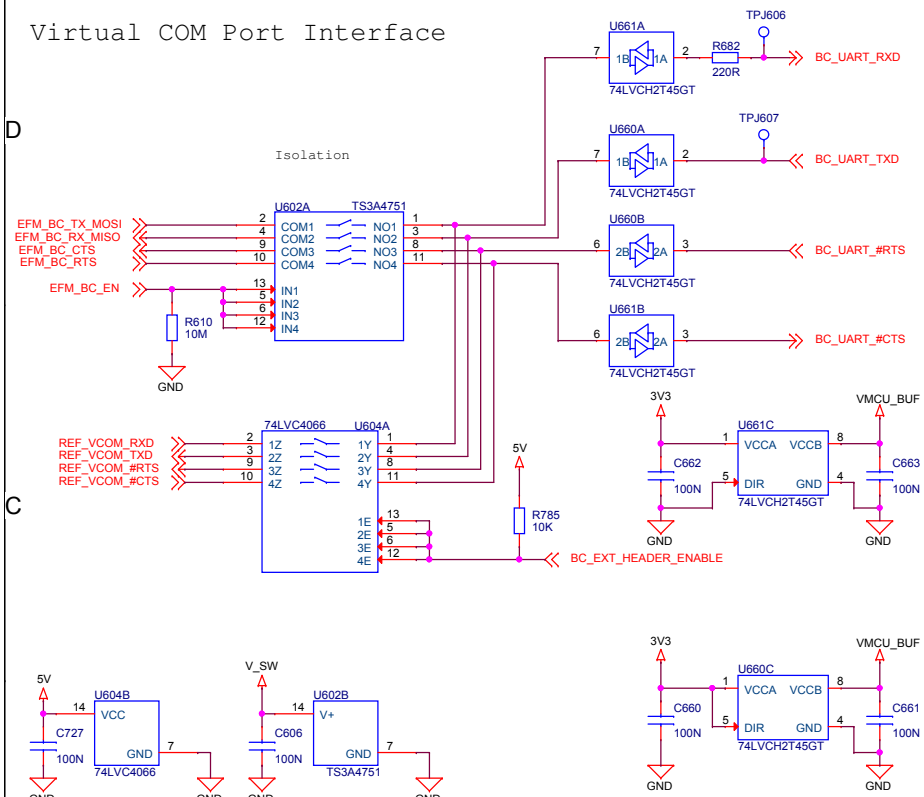
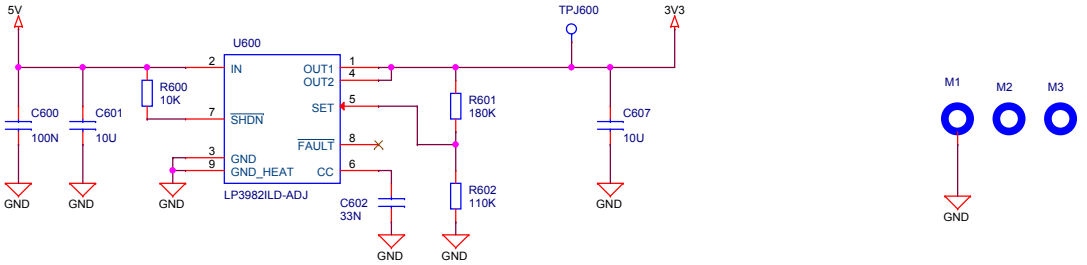
Virtual COM Port Interface

Level Shift

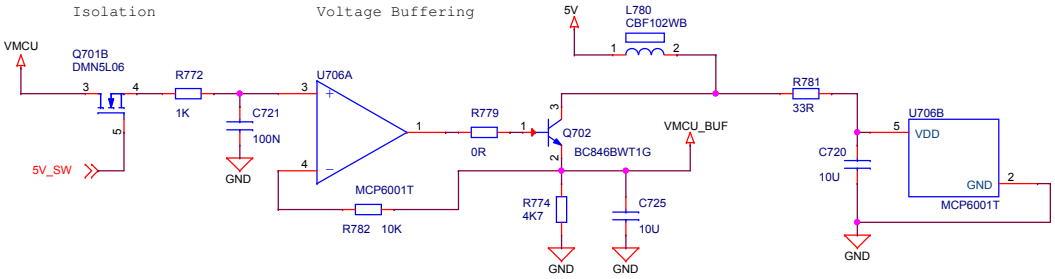
Isolation



3V3 Regulator



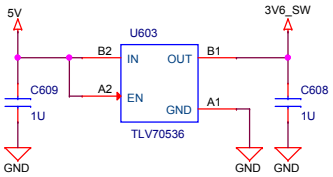
VMCU Voltage Mirror



Power Supply for Analog Switches

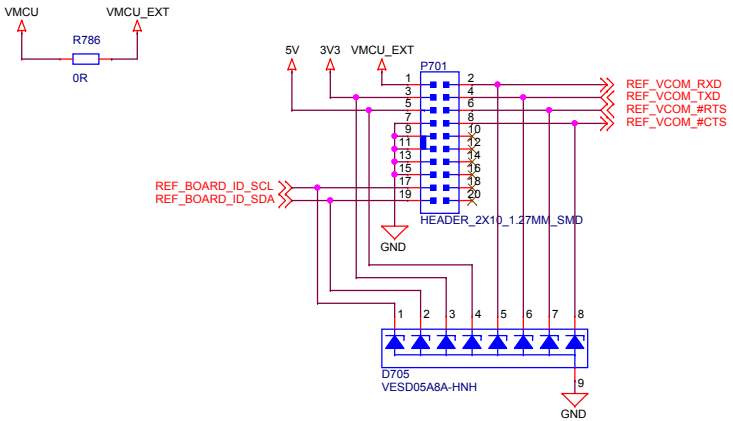
The USB VBUS voltage is used to bias these transistors, turning the P-Channel MOSFETs (Q700) off, and the N-Channel MOSFETs (Q701) on.

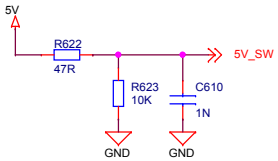
J-Link USB Cable	PMOS State	NMOS State	V_SW	VMCU_SENSE
Connected	Off	ON	3.6V	VMCU
Disconnected	ON	OFF	VMCU	Isolated

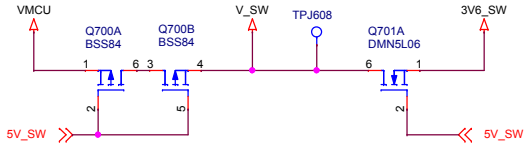


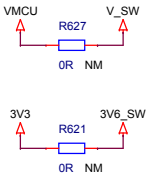
Connector for external reference designs boards

EXTERNAL BOARD









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EFM32GG11 STK

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Schematic Title

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Power & Misc

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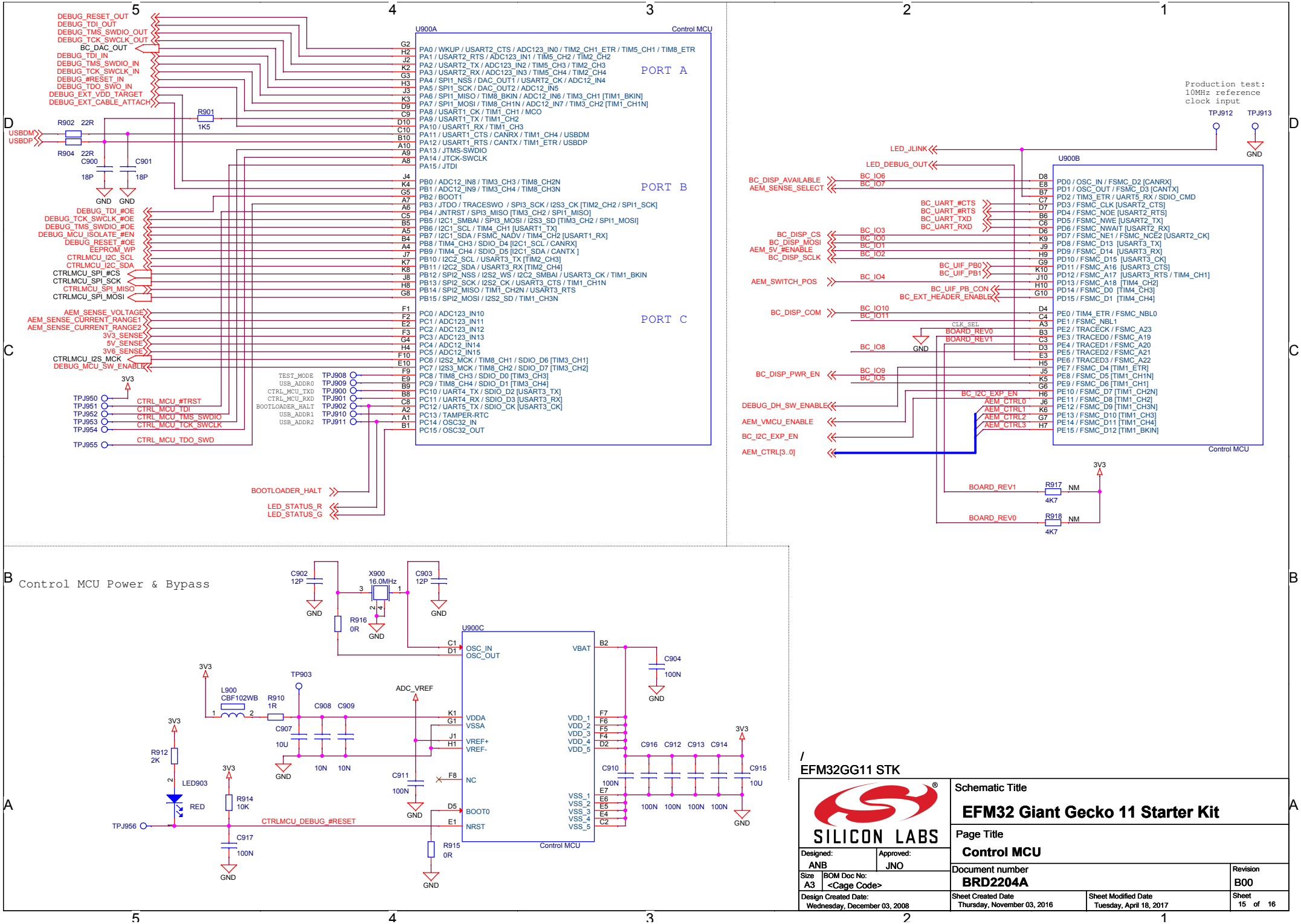
U900A
Control MCU
PORT A
PORT B
PORT C
DEBUG_RESET_OUT
DEBUG_TDI_OUT
DEBUG_TMS_SWDIO_OUT
DEBUG_TCK_SWCLK_OUT
BC_DAC_OUT
DEBUG_TDI_IN
DEBUG_TMS_SWDIO_IN
DEBUG_TCK_SWCLK_IN
DEBUG_#RESET_IN
DEBUG_TDO_SWO_IN
DEBUG_EXT_VDD_TARGET
DEBUG_EXT_CABLE_ATTACH
R901 1K5
USBDM
USBDP
R902 22R
R904 22R
C900 18P
C901 18P
GND
DEBUG_TDI_#OE
DEBUG_TCK_SWCLK_#OE
DEBUG_TMS_SWDIO_#OE
DEBUG_MCU_ISOLATE_#EN
DEBUG_RESET_#OE
EEPROM_WP
CTRLMCU_I2C_SCL
CTRLMCU_I2C_SDA
CTRLMCU_SPI_#CS
CTRLMCU_SPI_SCK
CTRLMCU_SPI_MISO
CTRLMCU_SPI_MOSI
AEM_SENSE_VOLTAGE
AEM_SENSE_CURRENT_RANGE1
AEM_SENSE_CURRENT_RANGE2
3V3_SENSE
5V_SENSE
3V6_SENSE
CTRLMCU_I2S_MCK
DEBUG_MCU_SW_ENABLE
3V3
TPJ950
TPJ951
TPJ952
TPJ953
TPJ954
TPJ955
CTRL_MCU_#TRST
CTRL_MCU_TDI
CTRL_MCU_TMS_SWDIO
CTRL_MCU_TCK_SWCLK
CTRL_MCU_TDO_SWD
TEST_MODE TPJ908
USB_ADDR0 TPJ909
CTRL_MCU_TXD TPJ900
CTRL_MCU_RXD TPJ901
BOOTLOADER_HALT TPJ902
USB_ADDR1 TPJ910
USB_ADDR2 TPJ911
BOOTLOADER_HALT
LED_STATUS_R
LED_STATUS_G
PA0 / WKUP / USART2_CTS / ADC123_IN0 / TIM2_CH1_ETR / TIM5_CH1 / TIM8_ETR
PA1 / USART2_RTS / ADC123_IN1 / TIM5_CH2 / TIM2_CH2
PA2 / USART2_TX / ADC123_IN2 / TIM5_CH3 / TIM2_CH3
PA3 / USART2_RX / ADC123_IN3 / TIM5_CH4 / TIM2_CH4
PA4 / SPI1_NSS / DAC_OUT1 / USART2_CK / ADC12_IN4
PA5 / SPI1_SCK / DAC_OUT2 / ADC12_IN5
PA6 / SPI1_MISO / TIM8_BKIN / ADC12_IN6 / TIM3_CH1 [TIM1_BKIN]
PA7 / SPI1_MOSI / TIM8_CH1N / ADC12_IN7 / TIM3_CH2 [TIM1_CH1N]
PA8 / USART1_CK / TIM1_CH1 / MCO
PA9 / USART1_TX / TIM1_CH2
PA10 / USART1_RX / TIM1_CH3
PA11 / USART1_CTS / CANRX / TIM1_CH4 / USBDM
PA12 / USART1_RTS / CANTX / TIM1_ETR / USBDP
PA13 / JTMS-SWDIO
PA14 / JTCK-SWCLK
PA15 / JTDI
PB0 / ADC12_IN8 / TIM3_CH3 / TIM8_CH2N
PB1 / ADC12_IN9 / TIM3_CH4 / TIM8_CH3N
PB2 / BOOT1
PB3 / JTDO / TRACESWO / SPI3_SCK / I2S3_CK [TIM2_CH2 / SPI1_SCK]
PB4 / JNTRST / SPI3_MISO [TIM3_CH2 / SPI1_MISO]
PB5 / I2C1_SMBAI / SPI3_MOSI / I2S3_SD [TIM3_CH2 / SPI1_MOSI]
PB6 / I2C1_SCL / TIM4_CH1 [USART1_TX]
PB7 / I2C1_SDA / FSMC_NADV / TIM4_CH2 [USART1_RX]
PB8 / TIM4_CH3 / SDIO_D4 [I2C1_SCL / CANRX]
PB9 / TIM4_CH4 / SDIO_D5 [I2C1_SDA / CANTX]
PB10 / I2C2_SCL / USART3_TX [TIM2_CH3]
PB11 / I2C2_SDA / USART3_RX [TIM2_CH4]
PB12 / SPI2_NSS / I2S2_WS / I2C2_SMBAI / USART3_CK / TIM1_BKIN
PB13 / SPI2_SCK / I2S2_CK / USART3_CTS / TIM1_CH1N
PB14 / SPI2_MISO / TIM1_CH2N / USART3_RTS
PB15 / SPI2_MOSI / I2S2_SD / TIM1_CH3N
PC0 / ADC123_IN10
PC1 / ADC123_IN11
PC2 / ADC123_IN12
PC3 / ADC123_IN13
PC4 / ADC12_IN14
PC5 / ADC12_IN15
PC6 / I2S2_MCK / TIM8_CH1 / SDIO_D6 [TIM3_CH1]
PC7 / I2S3_MCK / TIM8_CH2 / SDIO_D7 [TIM3_CH2]
PC8 / TIM8_CH3 / SDIO_D0 [TIM3_CH3]
PC9 / TIM8_CH4 / SDIO_D1 [TIM3_CH4]
PC10 / UART4_TX / SDIO_D2 [USART3_TX]
PC11 / UART4_RX / SDIO_D3 [USART3_RX]
PC12 / UART5_TX / SDIO_CK [USART3_CK]
PC13 / TAMPER-RTC
PC14 / OSC32_IN
PC15 / OSC32_OUT
Production test:
10MHz reference
clock input
TPJ912
TPJ913
GND
U900B
Control MCU
LED_JLINK
LED_DEBUG_OUT
BC_DISP_AVAILABLE
AEM_SENSE_SELECT
BC_UART_#CTS
BC_UART_#RTS
BC_UART_TXD
BC_UART_RXD
BC_DISP_CS
BC_DISP_MOSI
AEM_5V_#ENABLE
BC_DISP_SCLK
BC_UIF_PB0
BC_UIF_PB1
AEM_SWITCH_POS
BC_UIF_PB_CON
BC_EXT_HEADER_ENABLE
BC_DISP_COM
CLK_SEL
BOARD_REV0
BOARD_REV1
BC_DISP_PWR_EN
BC_I2C_EXP_EN
AEM_CTRL0
AEM_CTRL1
AEM_CTRL2
AEM_CTRL3
DEBUG_DH_SW_ENABLE
AEM_VMCU_ENABLE
BC_I2C_EXP_EN
AEM_CTRL[3..0]
R917 4K7 NM
R918 4K7 NM
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]
Control MCU Power & Bypass
C902 12P
X900 16.0MHz
C903 12P
R916 0R
U900C
OSC_IN
OSC_OUT
VBAT
C904 100N
TP903
L900 CBF102WB
R910 1R
C908
C909
ADC_VREF
C907 10U
10N
VDDA
VSSA
VREF+
VREF-
VDD_1
VDD_2
VDD_3
VDD_4
VDD_5
C916
C912
C913
C914
C915 10U
C910 100N
100N
VSS_1
VSS_2
VSS_3
VSS_4
VSS_5
R912 2K
LED903
RED
R914 10K
C911 100N
NC
BOOT0
NRST
CTRLMCU_DEBUG_#RESET
TPJ956
C917 100N
R915 0R
Control MCU
/
EFM32GG11 STK
SILICON LABS
Schematic Title
EFM32 Giant Gecko 11 Starter Kit
Page Title
Control MCU
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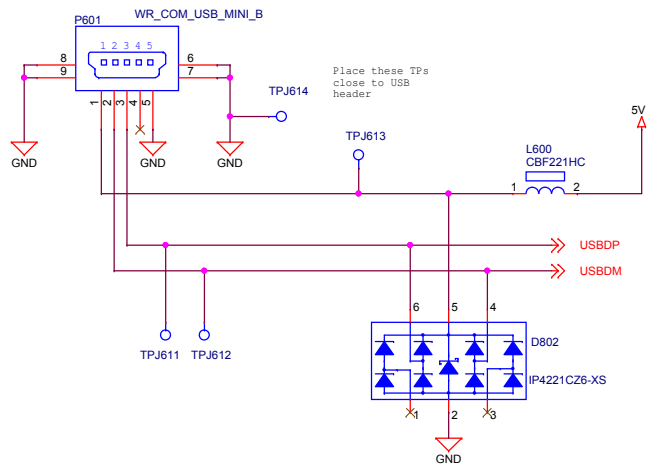
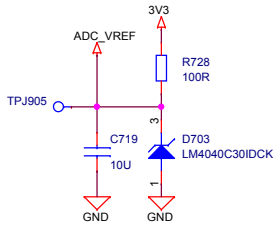
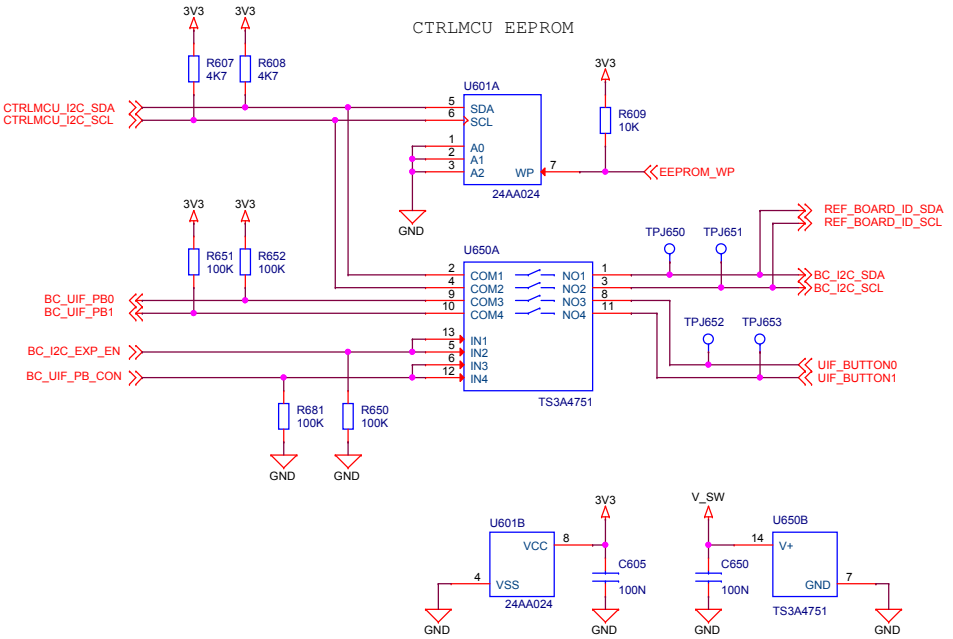
J-Link USB Port



ADC reference voltage



CTRLMCU EEPROM



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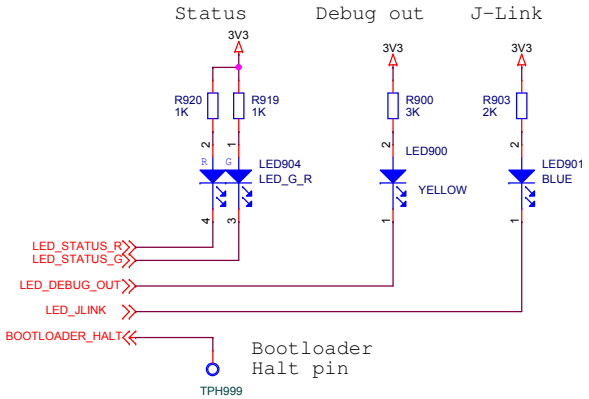
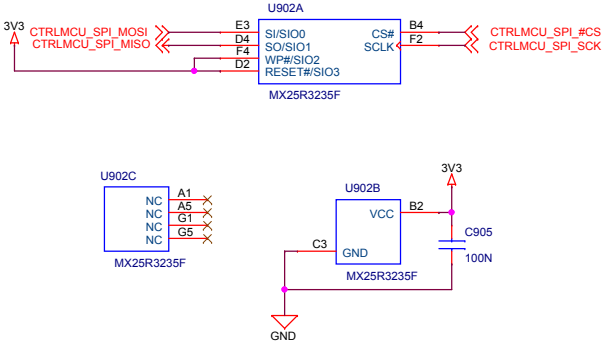
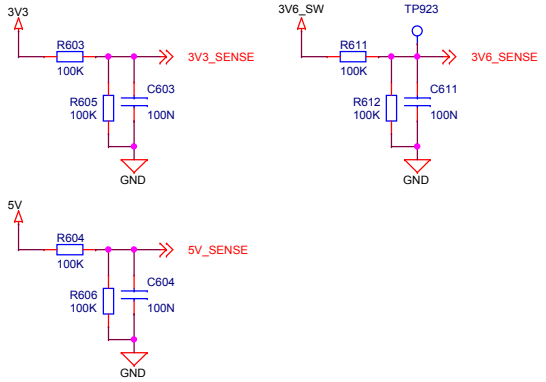


CTRLMCU SERIAL FLASH



POWER SENSE



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Schematic Title
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Page Title
Board Controller Misc

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