EFM32 Leopard Gecko Starter Kit

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Revision History

Rev.	Description
A00	Initial release. Transition to new STK platform.
A01	P801 connector changed
A02	P400 connector change

PCB1

PCB2201B

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Designed: MAH	Approved: RGU
Size: A3	Sheet Modified Date: Tuesday, November 21, 2023

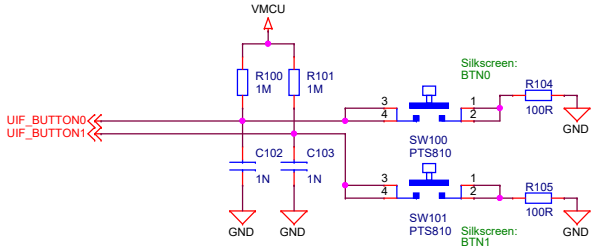
Board Name: **EFM32 Leopard Gecko Starter Kit**

Page Title: **Title Page**

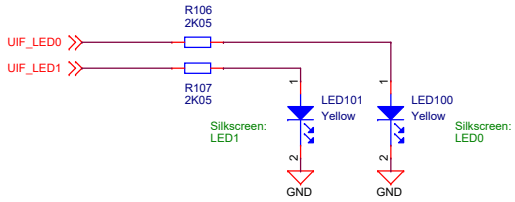
Board Number: **BRD2201B**

Revision: **A02**

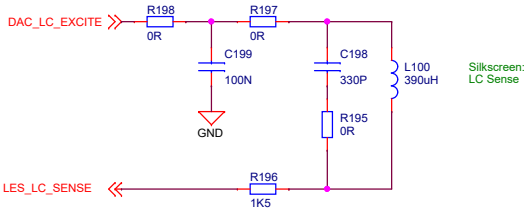
Push Buttons



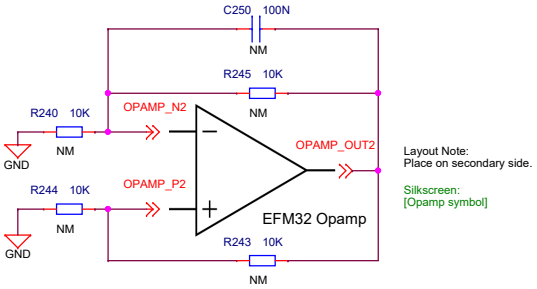
LEDs



LESENSE LC-Sensor



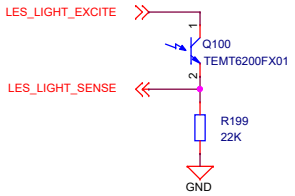
OPAMP Connection Footprint



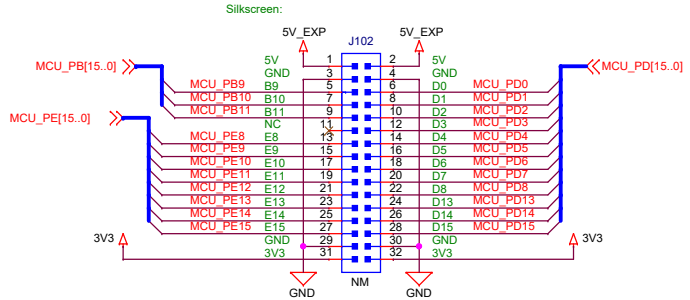
Layout Note:
Place on secondary side.

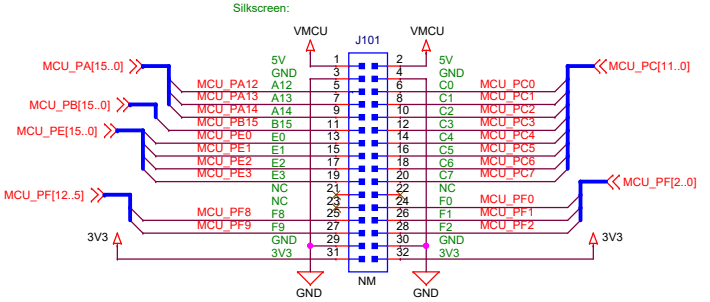
Silkscreen:
[Opamp symbol]

Photo Transistor

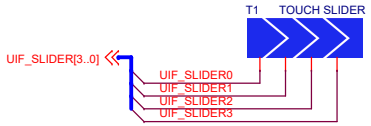


Breakout Pads

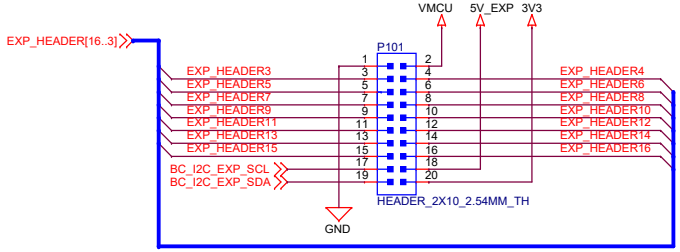




Touch Slider



EXP Header



EXP Header Functionality

Top Row

2	VMCU		
4	PD0	US1_TX	ADC0_CH0
6	PD1	US1_RX	ADC0_CH1
8	PD2	US1_CLK	ADC0_CH2
10	PD3	US1_CS	ADC0_CH3
12	PD4	LEU0_TX	ADC0_CH4
14	PD5	LEU0_RX	ADC0_CH5
16	PD6	I2C0_SDA#1	
18	5V		
20	3V3		

Bottom Row

1	GND		
3	PC0		ACMP0_CH4
5	PC3		ACMP0_CH5
7	PC4		ACMP1_CH4
9	PC5		ACMP0_O
11	PB11		DAC0_OUT0
13	PB12		DAC0_OUT1
15	PD7	I2C0_SCL#1	
17	Reserved for EXP Board Identification		
19	Reserved for EXP Board Identification		

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Designed	MAH
Approved	RGU
Size	A3
Sheet Modified Date	Tuesday, November 21, 2023

Board Name
EFM32 Leopard Gecko Starter Kit

Page Title
User Interface

Board Number
BRD2201B

Revision
A02

Sheet
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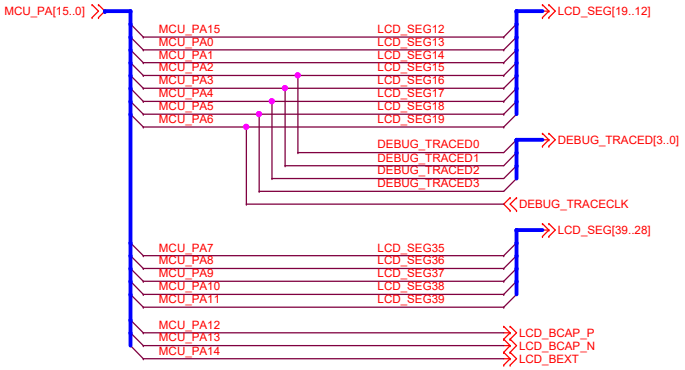
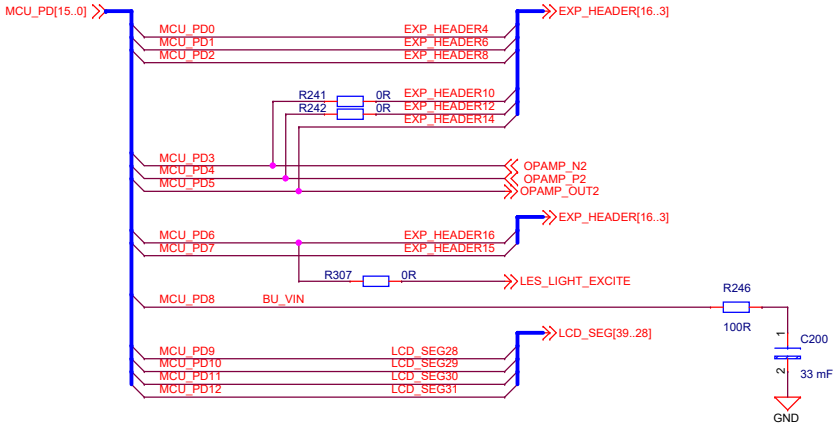
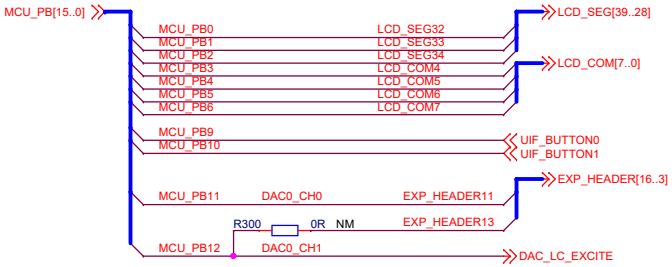
PA Connections



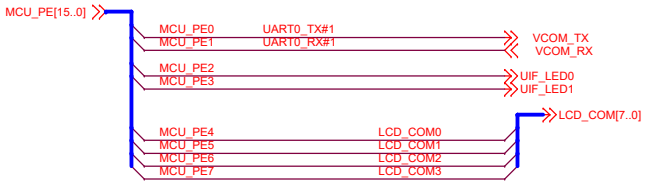
PD Connections



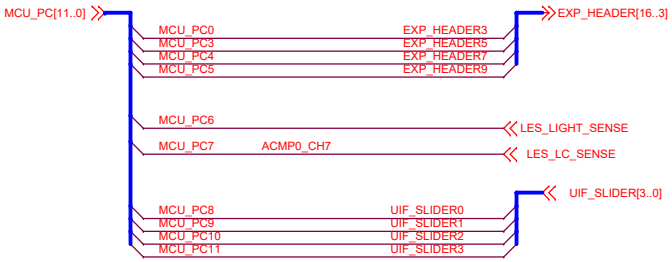
PB Connections



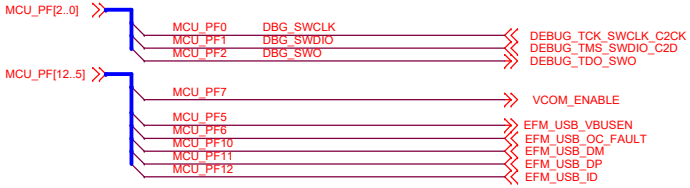
PE Connections



PC Connections



PF Connections



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Designed: MAH	Approved: RGU
Size: A3	Sheet Modified Date: Tuesday, November 21, 2023

Board Name: **EFM32 Leopard Gecko Starter Kit**

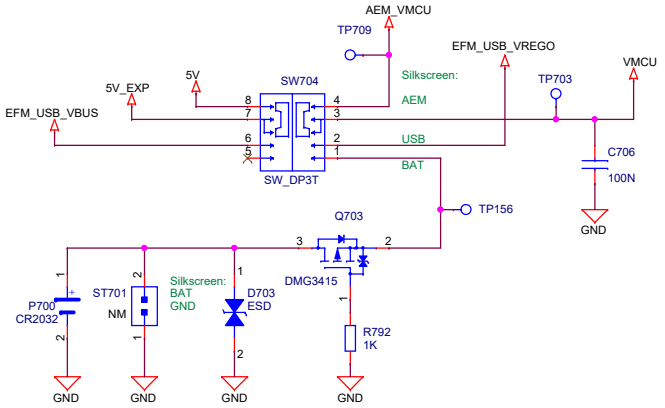
Page Title: **EFM32 Signal Assignments**

Board Number: **BRD2201B**

Revision: **A02**

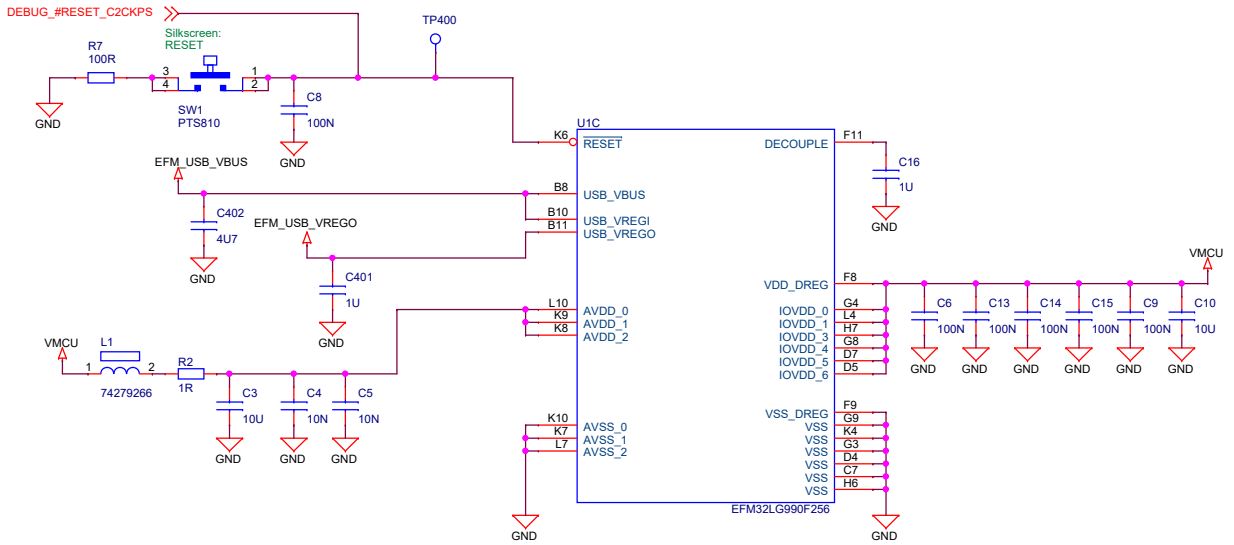
Sheet: 3 of 12

Power Selection Switch: AEM/USB/BAT

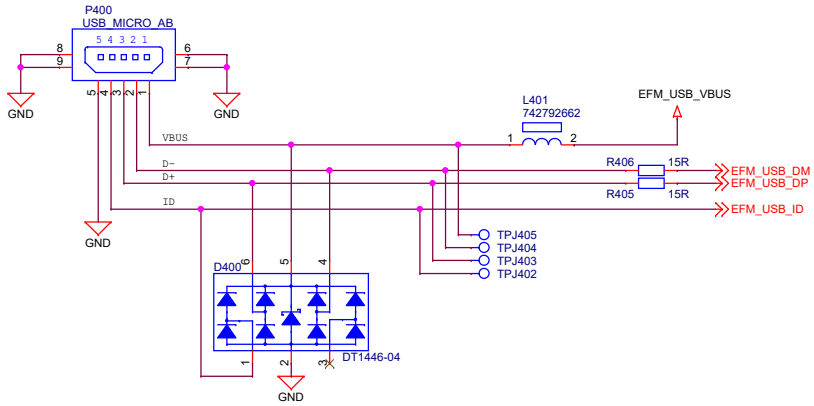


SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply
USB	AEM Disabled. VMCU sourced from internal 3.3V LDO powered by MCU USB 5V supply, EXP header and breakout 5V sourced from MCU USB 5V supply
BAT	AEM Disabled, VMCU sourced from coin-cell battery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

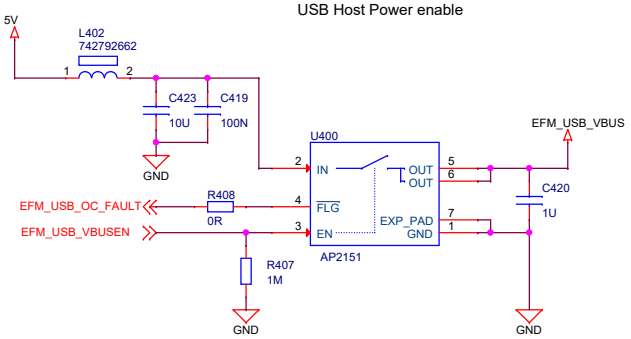
EFM32 Power and Decoupling



EFM32 USB Interface



USB Host Power enable



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Board Name	EFM32 Leopard Gecko Starter Kit
Page Title	EFM32 Power
Designed: MAH / Approved: RGU	
Size: A3 / Sheet Modified Date: Tuesday, November 21, 2023	
Board Number: BRD2201B	Revision: A02
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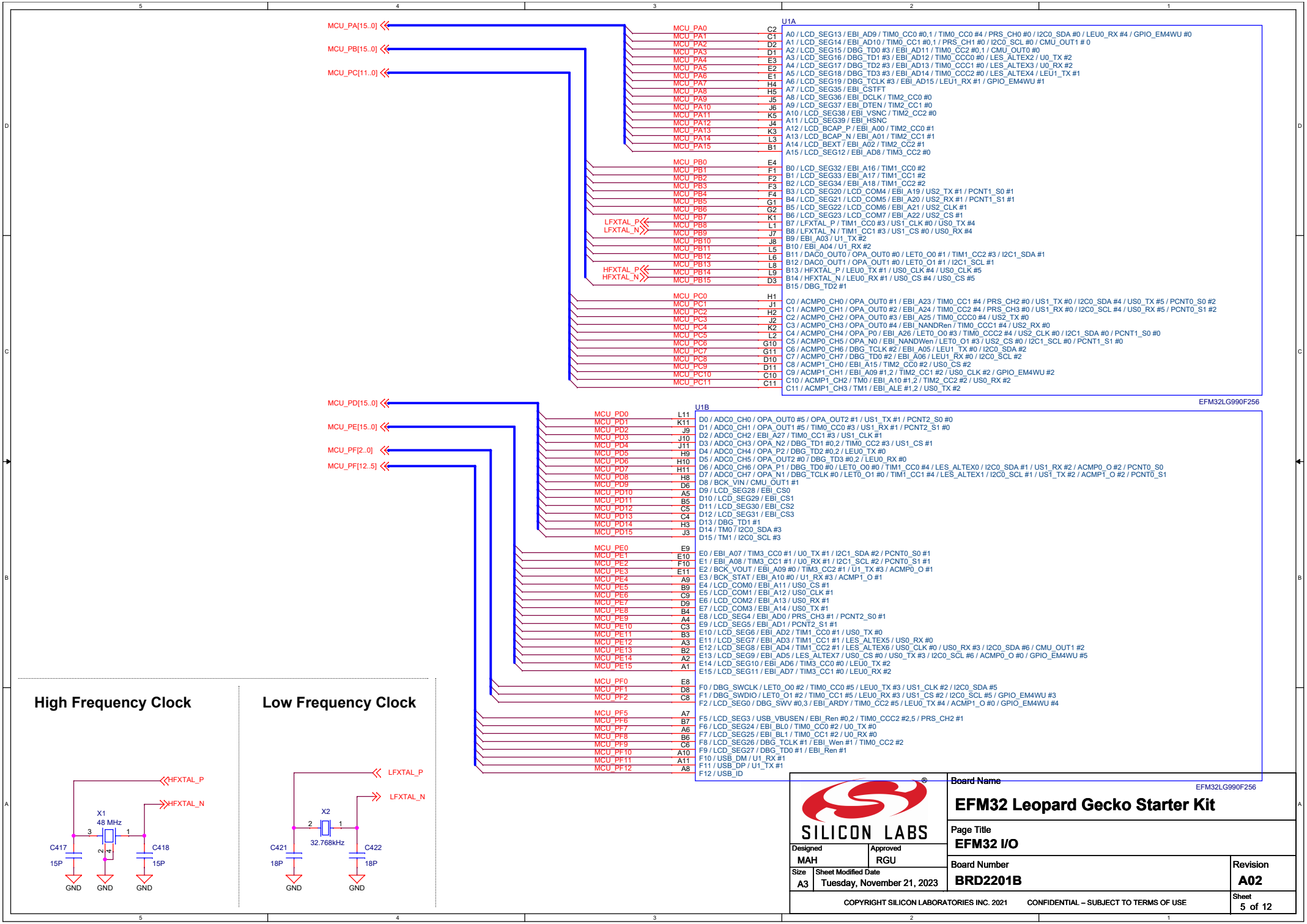
MCU_PA[15..0]
MCU_PB[15..0]
MCU_PC[11..0]
U1A
MCU_PA0 C2 A0 / LCD_SEG13 / EBI_AD9 / TIM0_CC0 #0,1 / TIM0_CC0 #4 / PRS_CH0 #0 / I2C0_SDA #0 / LEU0_RX #4 / GPIO_EM4WU #0
MCU_PA1 C1 A1 / LCD_SEG14 / EBI_AD10 / TIM0_CC1 #0,1 / PRS_CH1 #0 / I2C0_SCL #0 / CMU_OUT1 # 0
MCU_PA2 D2 A2 / LCD_SEG15 / DBG_TD0 #3 / EBI_AD11 / TIM0_CC2 #0,1 / CMU_OUT0 #0
MCU_PA3 D1 A3 / LCD_SEG16 / DBG_TD1 #3 / EBI_AD12 / TIM0_CCC0 #0 / LES_ALTEX2 / U0_TX #2
MCU_PA4 E3 A4 / LCD_SEG17 / DBG_TD2 #3 / EBI_AD13 / TIM0_CCC1 #0 / LES_ALTEX3 / U0_RX #2
MCU_PA5 E2 A5 / LCD_SEG18 / DBG_TD3 #3 / EBI_AD14 / TIM0_CCC2 #0 / LES_ALTEX4 / LEU1_TX #1
MCU_PA6 E1 A6 / LCD_SEG19 / DBG_TCLK #3 / EBI_AD15 / LEU1_RX #1 / GPIO_EM4WU #1
MCU_PA7 H4 A7 / LCD_SEG35 / EBI_CSTFT
MCU_PA8 H5 A8 / LCD_SEG36 / EBI_DCLK / TIM2_CC0 #0
MCU_PA9 J5 A9 / LCD_SEG37 / EBI_DTEN / TIM2_CC1 #0
MCU_PA10 J6 A10 / LCD_SEG38 / EBI_VSNC / TIM2_CC2 #0
MCU_PA11 K5 A11 / LCD_SEG39 / EBI_HSNC
MCU_PA12 J4 A12 / LCD_BCAP_P / EBI_A00 / TIM2_CC0 #1
MCU_PA13 K3 A13 / LCD_BCAP_N / EBI_A01 / TIM2_CC1 #1
MCU_PA14 L3 A14 / LCD_BEXT / EBI_A02 / TIM2_CC2 #1
MCU_PA15 B1 A15 / LCD_SEG12 / EBI_AD8 / TIM3_CC2 #0
MCU_PB0 E4 B0 / LCD_SEG32 / EBI_A16 / TIM1_CC0 #2
MCU_PB1 F1 B1 / LCD_SEG33 / EBI_A17 / TIM1_CC1 #2
MCU_PB2 F2 B2 / LCD_SEG34 / EBI_A18 / TIM1_CC2 #2
MCU_PB3 F3 B3 / LCD_SEG20 / LCD_COM4 / EBI_A19 / US2_TX #1 / PCNT1_S0 #1
MCU_PB4 F4 B4 / LCD_SEG21 / LCD_COM5 / EBI_A20 / US2_RX #1 / PCNT1_S1 #1
MCU_PB5 G1 B5 / LCD_SEG22 / LCD_COM6 / EBI_A21 / US2_CLK #1
MCU_PB6 G2 B6 / LCD_SEG23 / LCD_COM7 / EBI_A22 / US2_CS #1
LFXTAL_P MCU_PB7 K1 B7 / LFXTAL_P / TIM1_CC0 #3 / US1_CLK #0 / US0_TX #4
LFXTAL_N MCU_PB8 L1 B8 / LFXTAL_N / TIM1_CC1 #3 / US1_CS #0 / US0_RX #4
MCU_PB9 J7 B9 / EBI_A03 / U1_TX #2
MCU_PB10 J8 B10 / EBI_A04 / U1_RX #2
MCU_PB11 L5 B11 / DAC0_OUT0 / OPA_OUT0 #0 / LET0_O0 #1 / TIM1_CC2 #3 / I2C1_SDA #1
MCU_PB12 L6 B12 / DAC0_OUT1 / OPA_OUT1 #0 / LET0_O1 #1 / I2C1_SCL #1
HFXTAL_P MCU_PB13 L8 B13 / HFXTAL_P / LEU0_TX #1 / US0_CLK #4 / US0_CLK #5
HFXTAL_N MCU_PB14 L9 B14 / HFXTAL_N / LEU0_RX #1 / US0_CS #4 / US0_CS #5
MCU_PB15 D3 B15 / DBG_TD2 #1
MCU_PC0 H1 C0 / ACMP0_CH0 / OPA_OUT0 #1 / EBI_A23 / TIM0_CC1 #4 / PRS_CH2 #0 / US1_TX #0 / I2C0_SDA #4 / US0_TX #5 / PCNT0_S0 #2
MCU_PC1 J1 C1 / ACMP0_CH1 / OPA_OUT0 #2 / EBI_A24 / TIM0_CC2 #4 / PRS_CH3 #0 / US1_RX #0 / I2C0_SCL #4 / US0_RX #5 / PCNT0_S1 #2
MCU_PC2 H2 C2 / ACMP0_CH2 / OPA_OUT0 #3 / EBI_A25 / TIM0_CCC0 #4 / US2_TX #0
MCU_PC3 J2 C3 / ACMP0_CH3 / OPA_OUT0 #4 / EBI_NANDRen / TIM0_CCC1 #4 / US2_RX #0
MCU_PC4 K2 C4 / ACMP0_CH4 / OPA_P0 / EBI_A26 / LET0_O0 #3 / TIM0_CCC2 #4 / US2_CLK #0 / I2C1_SDA #0 / PCNT1_S0 #0
MCU_PC5 L2 C5 / ACMP0_CH5 / OPA_N0 / EBI_NANDWen / LET0_O1 #3 / US2_CS #0 / I2C1_SCL #0 / PCNT1_S1 #0
MCU_PC6 G10 C6 / ACMP0_CH6 / DBG_TCLK #2 / EBI_A05 / LEU1_TX #0 / I2C0_SDA #2
MCU_PC7 G11 C7 / ACMP0_CH7 / DBG_TD0 #2 / EBI_A06 / LEU1_RX #0 / I2C0_SCL #2
MCU_PC8 D10 C8 / ACMP1_CH0 / EBI_A15 / TIM2_CC0 #2 / US0_CS #2
MCU_PC9 D11 C9 / ACMP1_CH1 / EBI_A09 #1,2 / TIM2_CC1 #2 / US0_CLK #2 / GPIO_EM4WU #2
MCU_PC10 C10 C10 / ACMP1_CH2 / TM0 / EBI_A10 #1,2 / TIM2_CC2 #2 / US0_RX #2
MCU_PC11 C11 C11 / ACMP1_CH3 / TM1 / EBI_ALE #1,2 / US0_TX #2
EFM32LG990F256
MCU_PD[15..0]
MCU_PE[15..0]
MCU_PF[2..0]
MCU_PF[12..5]
U1B
MCU_PD0 L11 D0 / ADC0_CH0 / OPA_OUT0 #5 / OPA_OUT2 #1 / US1_TX #1 / PCNT2_S0 #0
MCU_PD1 K11 D1 / ADC0_CH1 / OPA_OUT1 #5 / TIM0_CC0 #3 / US1_RX #1 / PCNT2_S1 #0
MCU_PD2 J9 D2 / ADC0_CH2 / EBI_A27 / TIM0_CC1 #3 / US1_CLK #1
MCU_PD3 J10 D3 / ADC0_CH3 / OPA_N2 / DBG_TD1 #0,2 / TIM0_CC2 #3 / US1_CS #1
MCU_PD4 J11 D4 / ADC0_CH4 / OPA_P2 / DBG_TD2 #0,2 / LEU0_TX #0
MCU_PD5 H9 D5 / ADC0_CH5 / OPA_OUT2 #0 / DBG_TD3 #0,2 / LEU0_RX #0
MCU_PD6 H10 D6 / ADC0_CH6 / OPA_P1 / DBG_TDO #0 / LET0_O0 #0 / TIM1_CC0 #4 / LES_ALTEX0 / I2C0_SDA #1 / US1_RX #2 / ACMP0_O #2 / PCNT0_S0
MCU_PD7 H11 D7 / ADC0_CH7 / OPA_N1 / DBG_TCLK #0 / LET0_O1 #0 / TIM1_CC1 #4 / LES_ALTEX1 / I2C0_SCL #1 / US1_TX #2 / ACMP1_O #2 / PCNT0_S1
MCU_PD8 H8 D8 / BCK_VIN / CMU_OUT1 #1
MCU_PD9 D6 D9 / LCD_SEG28 / EBI_CS0
MCU_PD10 A5 D10 / LCD_SEG29 / EBI_CS1
MCU_PD11 B5 D11 / LCD_SEG30 / EBI_CS2
MCU_PD12 C5 D12 / LCD_SEG31 / EBI_CS3
MCU_PD13 C4 D13 / DBG_TD1 #1
MCU_PD14 H3 D14 / TM0 / I2C0_SDA #3
MCU_PD15 J3 D15 / TM1 / I2C0_SCL #3
MCU_PE0 E9 E0 / EBI_A07 / TIM3_CC0 #1 / U0_TX #1 / I2C1_SDA #2 / PCNT0_S0 #1
MCU_PE1 E10 E1 / EBI_A08 / TIM3_CC1 #1 / U0_RX #1 / I2C1_SCL #2 / PCNT0_S1 #1
MCU_PE2 F10 E2 / BCK_VOUT / EBI_A09 #0 / TIM3_CC2 #1 / U1_TX #3 / ACMP0_O #1
MCU_PE3 E11 E3 / BCK_STAT / EBI_A10 #0 / U1_RX #3 / ACMP1_O #1
MCU_PE4 A9 E4 / LCD_COM0 / EBI_A11 / US0_CS #1
MCU_PE5 B9 E5 / LCD_COM1 / EBI_A12 / US0_CLK #1
MCU_PE6 C9 E6 / LCD_COM2 / EBI_A13 / US0_RX #1
MCU_PE7 D9 E7 / LCD_COM3 / EBI_A14 / US0_TX #1
MCU_PE8 B4 E8 / LCD_SEG4 / EBI_AD0 / PRS_CH3 #1 / PCNT2_S0 #1
MCU_PE9 A4 E9 / LCD_SEG5 / EBI_AD1 / PCNT2_S1 #1
MCU_PE10 C3 E10 / LCD_SEG6 / EBI_AD2 / TIM1_CC0 #1 / US0_TX #0
MCU_PE11 B3 E11 / LCD_SEG7 / EBI_AD3 / TIM1_CC1 #1 / LES_ALTEX5 / US0_RX #0
MCU_PE12 A3 E12 / LCD_SEG8 / EBI_AD4 / TIM1_CC2 #1 / LES_ALTEX6 / US0_CLK #0 / US0_RX #3 / I2C0_SDA #6 / CMU_OUT1 #2
MCU_PE13 B2 E13 / LCD_SEG9 / EBI_AD5 / LES_ALTEX7 / US0_CS #0 / US0_TX #3 / I2C0_SCL #6 / ACMP0_O #0 / GPIO_EM4WU #5
MCU_PE14 A2 E14 / LCD_SEG10 / EBI_AD6 / TIM3_CC0 #0 / LEU0_TX #2
MCU_PE15 A1 E15 / LCD_SEG11 / EBI_AD7 / TIM3_CC1 #0 / LEU0_RX #2
MCU_PF0 E8 F0 / DBG_SWCLK / LET0_O0 #2 / TIM0_CC0 #5 / LEU0_TX #3 / US1_CLK #2 / I2C0_SDA #5
MCU_PF1 D8 F1 / DBG_SWDIO / LET0_O1 #2 / TIM0_CC1 #5 / LEU0_RX #3 / US1_CS #2 / I2C0_SCL #5 / GPIO_EM4WU #3
MCU_PF2 C8 F2 / LCD_SEG0 / DBG_SWV #0,3 / EBI_ARDY / TIM0_CC2 #5 / LEU0_TX #4 / ACMP1_O #0 / GPIO_EM4WU #4
MCU_PF5 A7 F5 / LCD_SEG3 / USB_VBUSEN / EBI_Ren #0,2 / TIM0_CCC2 #2,5 / PRS_CH2 #1
MCU_PF6 B7 F6 / LCD_SEG24 / EBI_BL0 / TIM0_CC0 #2 / U0_TX #0
MCU_PF7 A6 F7 / LCD_SEG25 / EBI_BL1 / TIM0_CC1 #2 / U0_RX #0
MCU_PF8 B6 F8 / LCD_SEG26 / DBG_TCLK #1 / EBI_Wen #1 / TIM0_CC2 #2
MCU_PF9 C6 F9 / LCD_SEG27 / DBG_TD0 #1 / EBI_Ren #1
MCU_PF10 A10 F10 / USB_DM / U1_RX #1
MCU_PF11 A11 F11 / USB_DP / U1_TX #1
MCU_PF12 A8 F12 / USB_ID
High Frequency Clock
HFXTAL_P
HFXTAL_N
X1
48 MHz
3
1
2
4
C417
15P
C418
15P
GND
GND
GND
Low Frequency Clock
LFXTAL_P
LFXTAL_N
X2
2
1
32.768kHz
C421
18P
C422
18P
GND
GND
SILICON LABS
Designed
MAH
Approved
RGU
Size
A3
Sheet Modified Date
Tuesday, November 21, 2023
Board Name
EFM32LG990F256
EFM32 Leopard Gecko Starter Kit
Page Title
EFM32 I/O
Board Number
BRD2201B
Revision
A02
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Sheet
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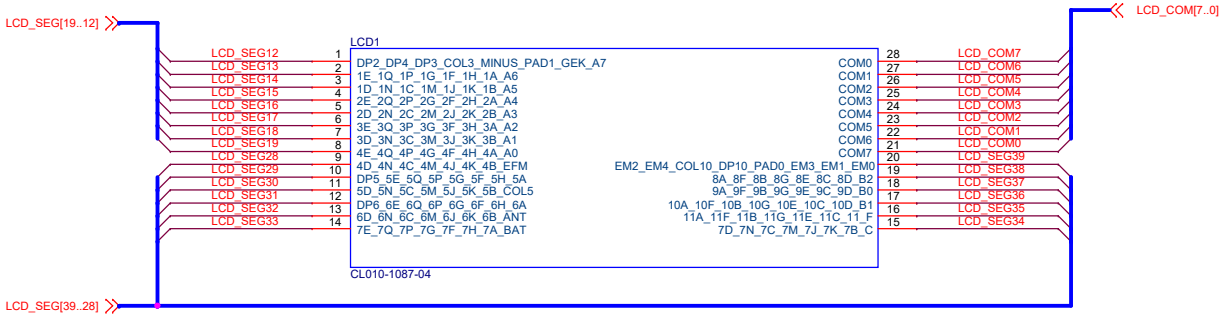
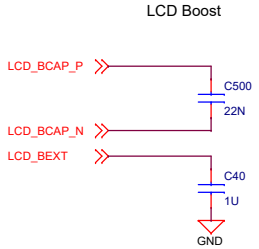
Segment LCD Signal Connections

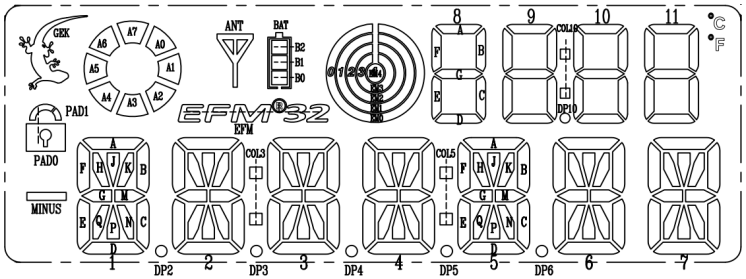




Segment Names

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14
———	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
COM0	DP2	1 E	1 D	2 E	2 D	3 E	3 D	4 E	4 D	DP5	5 D	DP6	6 D	7 E
COM1	DP4	1 Q	1 N	2 Q	2 N	3 Q	3 N	4 Q	4 N	5 E	5 N	6 E	6 N	7 Q
COM2	DP3	1 P	1 C	2 P	2 C	3 P	3 C	4 P	4 C	5 Q	5 C	6 Q	6 C	7 P
COM3	COL3	1 G	1 M	2 G	2 M	3 G	3 M	4 G	4 M	5 P	5 M	6 P	6 M	7 G
COM4	MINUS	1 F	1 J	2 F	2 J	3 F	3 J	4 F	4 J	5 G	5 J	6 G	6 J	7 F
COM5	PAD1	1 H	1 K	2 H	2 K	3 H	3 K	4 H	4 K	5 F	5 K	6 F	6 K	7 H
COM6	GEK	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 H	5 B	6 H	6 B	7 A
COM7	A7	A6	A5	A4	A3	A2	A1	A0	EFM	5 A	COL5	6 A	ANT	BAT

PIN	15	16	17	18	19	20	21	22	23	24	25	26	27	28
———	S14	S15	S16	S17	S18	S19	COM7	COM6	COM5	COM4	COM3	COM2	COM1	COM0
COM0	7 D	11 A	10 A	9 A	8 A	EM2								COM0
COM1	7 N	11 F	10 F	9 F	8 F	EM4							COM1	
COM2	7 C	11 B	10 B	9 B	8 B	COL10						COM2		
COM3	7 M	11 G	10 G	9 G	8 G	DP10					COM3			
COM4	7 J	11 E	10 E	9 E	8 E	PAD0				COM4				
COM5	7 K	11 C	10 C	9 C	8 C	EM3			COM5					
COM6	7 B	11 D	10 D	9 D	8 D	EM1		COM6						
COM7	°C	°F	B1	B0	B2	EM0	COM7							



SILICON LABS

Designed	HEL
Approved	RGU
Size	A3
Sheet Modified Date	Tuesday, November 21, 2023

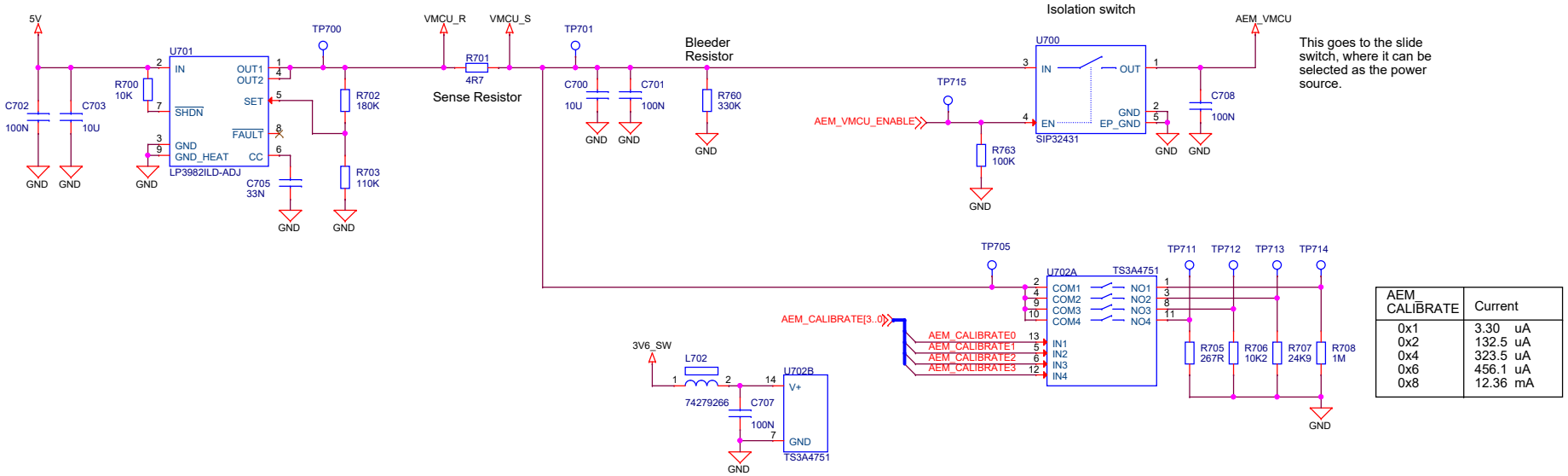
Board Name: **EFM32 Leopard Gecko Starter Kit**

Page Title: **Segment LCD**

Board Number: **BRD2201B**

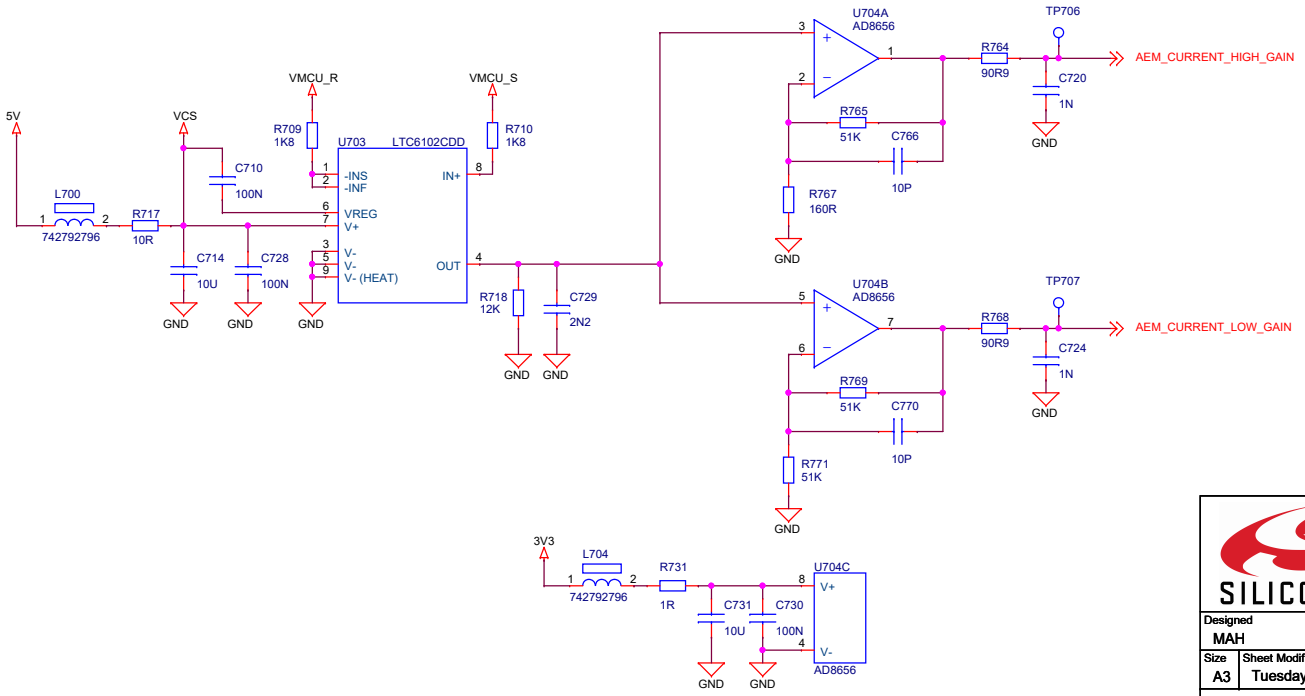
Revision: **A02**

MCU Power Regulator



AEM_CALIBRATE	Current
0x1	3.30 uA
0x2	132.5 uA
0x4	323.5 uA
0x6	456.1 uA
0x8	12.36 mA

Advanced Energy Monitoring



SILICON LABS

Designed: MAH	Approved: RGU
Size: A3	Sheet Modified Date: Tuesday, November 21, 2023

Board Name: **EFM32 Leopard Gecko Starter Kit**

Page Title: **Target Voltage Supply & AEM**

Board Number: **BRD2201B**

Revision: **A02**

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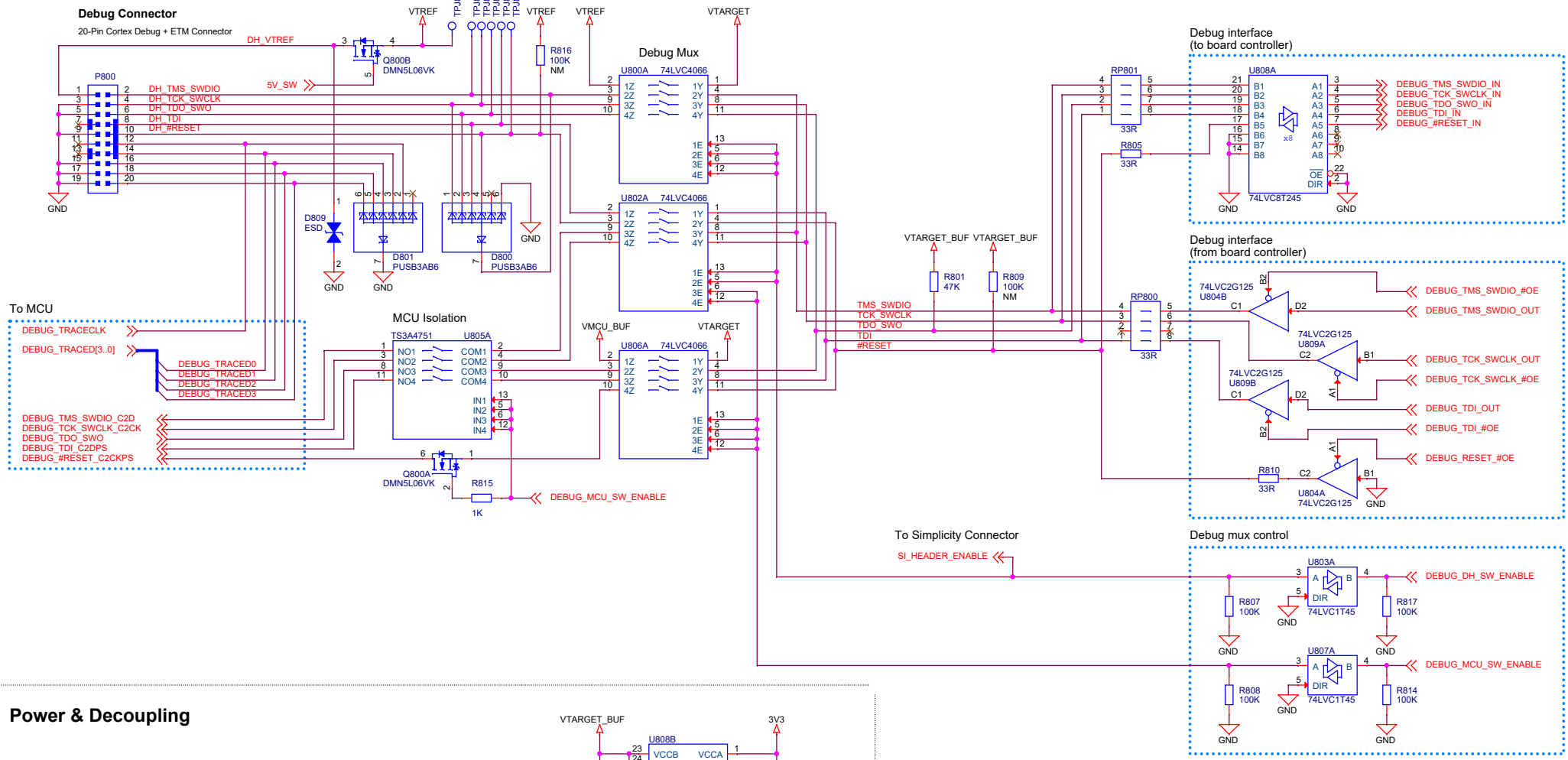
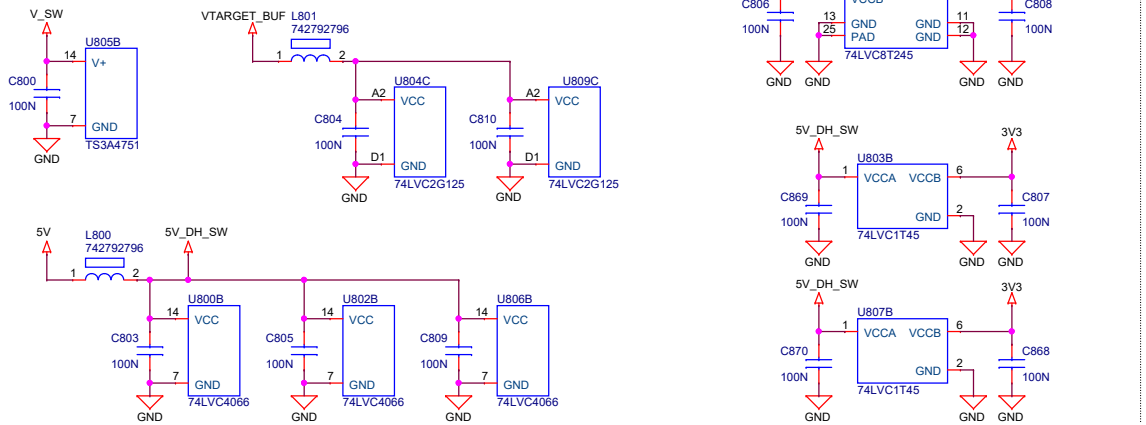
Debug Mux



Debug Mode	DH_SW_ENABLE	MCU_SW_ENABLE
MCU	0	1
Debug Out	1	0
Debug In	1	1
Debug Off	0	0

Debug Mode	VTARGET Source	VTREF Source
MCU	VMCU	None
Debug Out	VTREF (EXT)	External
Debug In	VMCU	VMCU_BUF
Debug Off	None	None

Power & Decoupling



Board Name	**EFM32 Leopard Gecko Starter Kit**
Page Title	**Debug Interface**
Designed	MAH
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Size	A3
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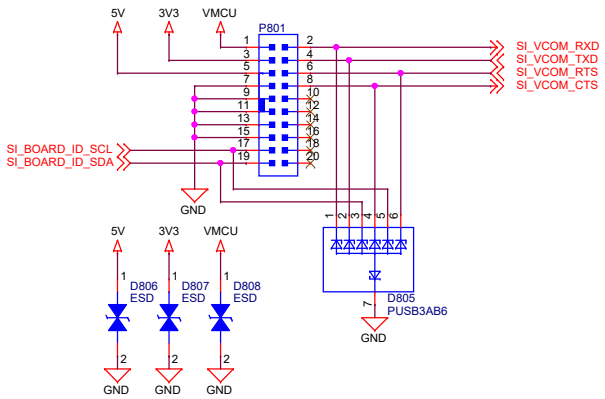
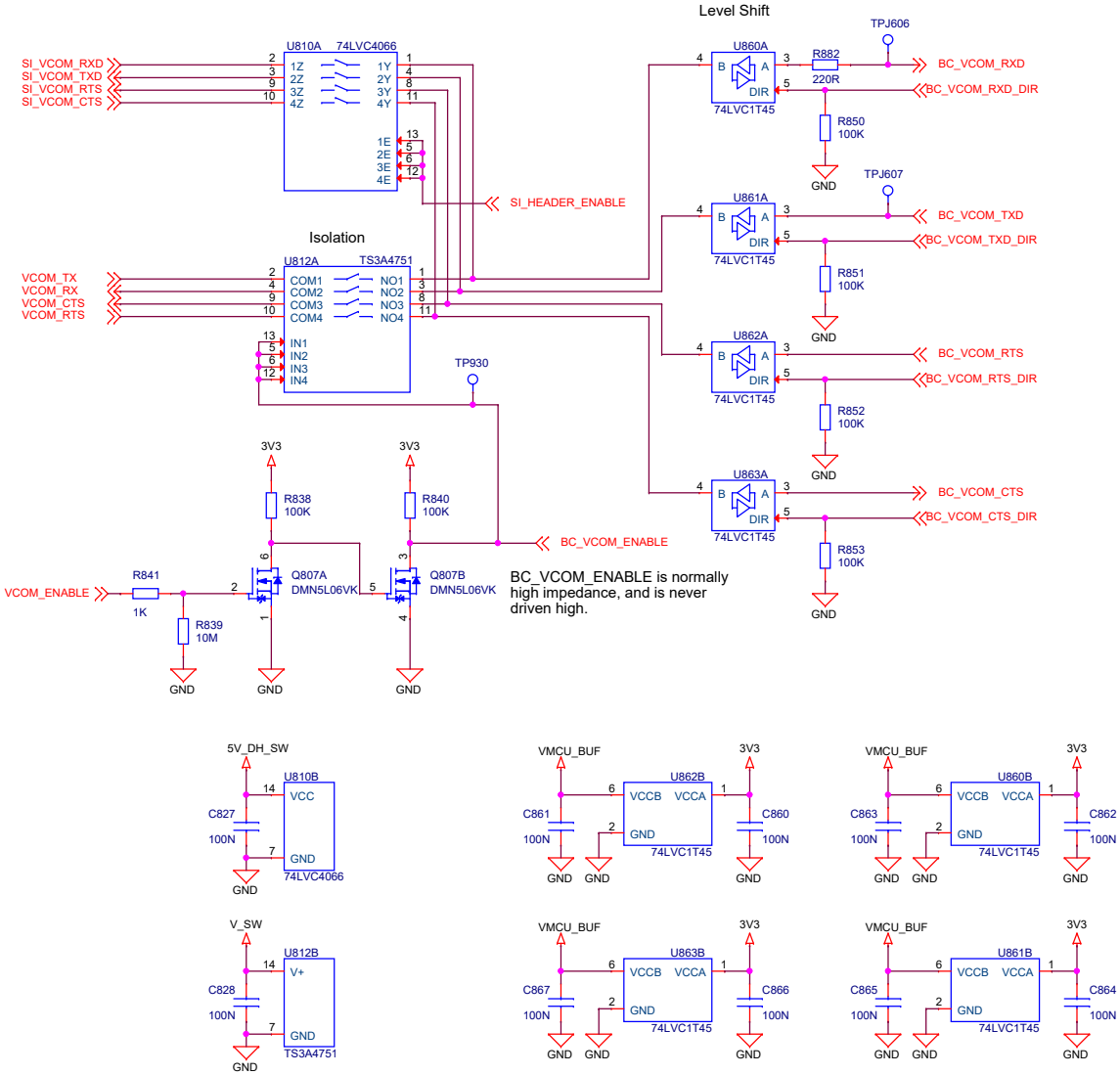
Simplicity Connector



VCOM Interface



Board Name	**EFM32 Leopard Gecko Starter Kit**
Page Title	**Simplicity & VCOM**
Designed: MAH	Approved: RGU
Size: A3	Sheet Modified Date: Tuesday, November 21, 2023
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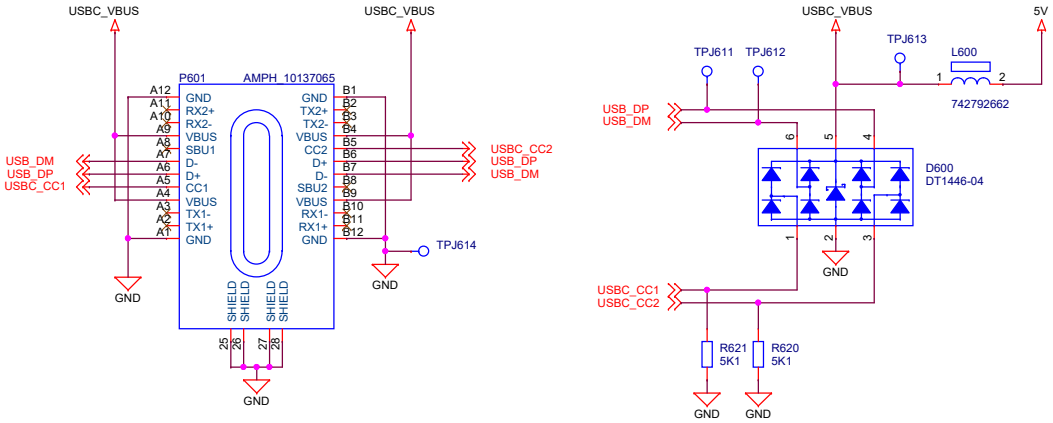
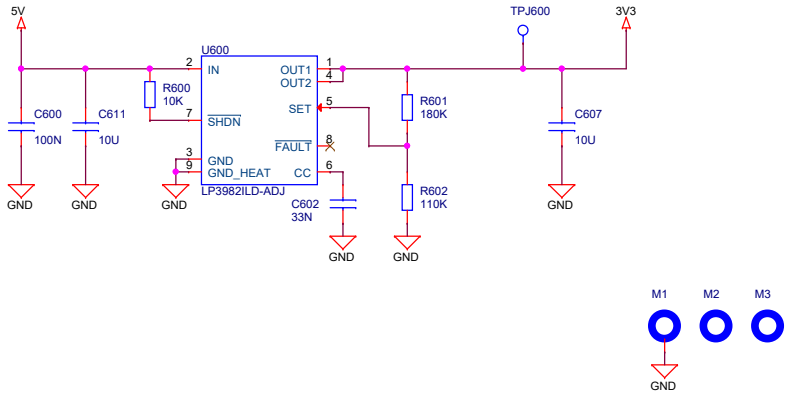
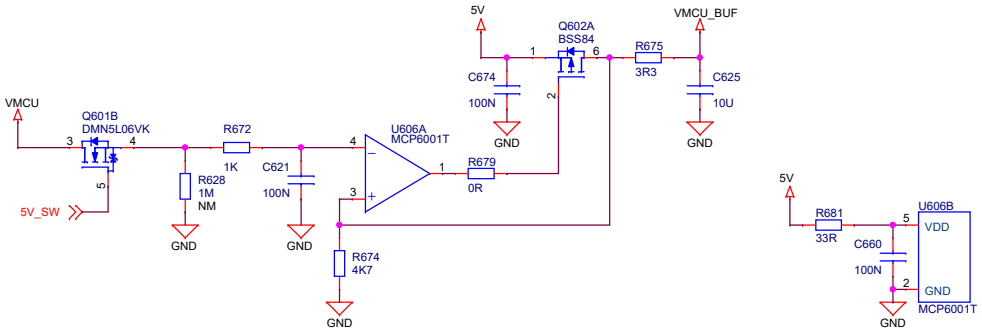
J-Link USB Port



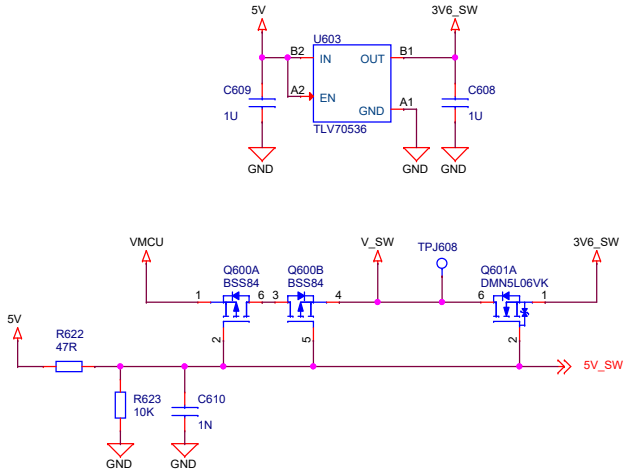
3V3 Regulator



VMCU Voltage Mirror



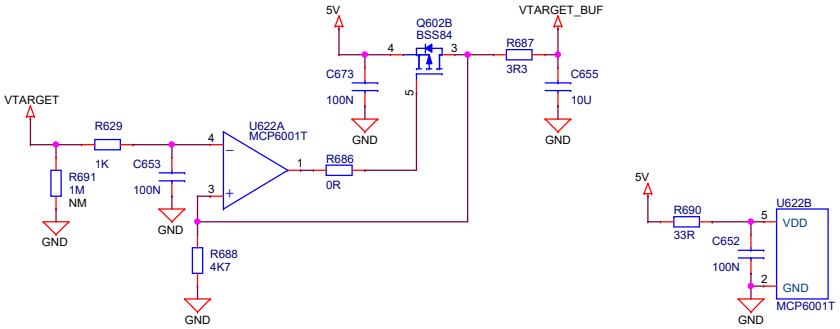
Power Supply for Analog Switches



J-Link USB Cable	Q600 State	Q601A State	V_SW	VMCU_SENSE
Connected	OFF	ON	3.6V	VMCU
Disconnected	ON	OFF	VMCU	Isolated

Isolation switches are powered by 3V6_SW when the USB cable is connected, otherwise by VMCU.

VTarget Voltage Mirror



SILICON LABS

Designed: MAH	Approved: RGU
Size: A3	Sheet Modified Date: Tuesday, November 21, 2023

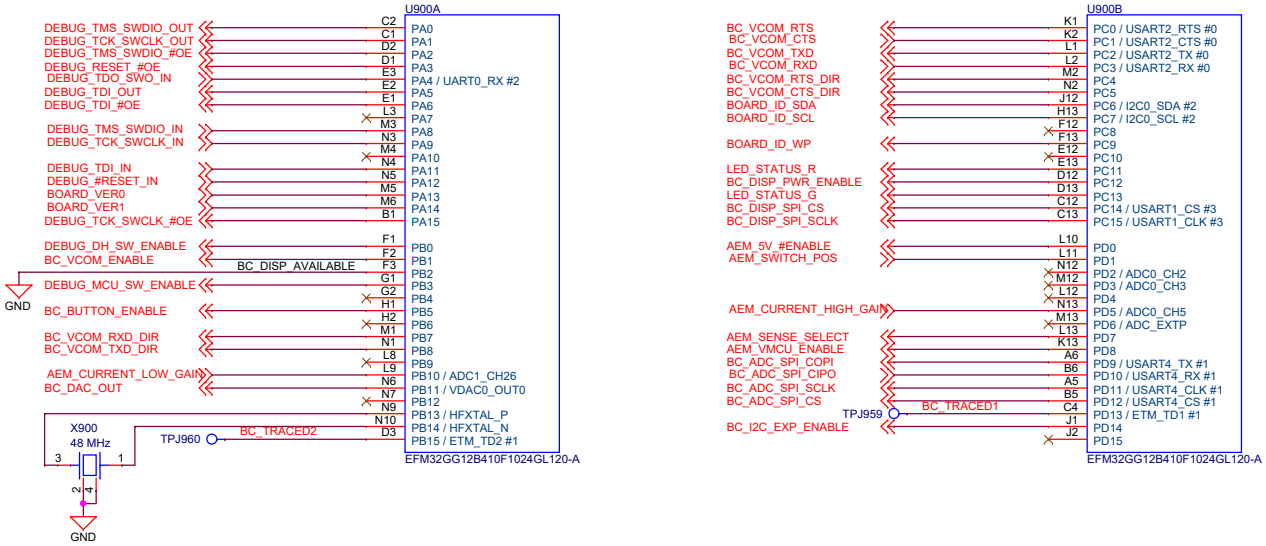
Board Name: **EFM32 Leopard Gecko Starter Kit**

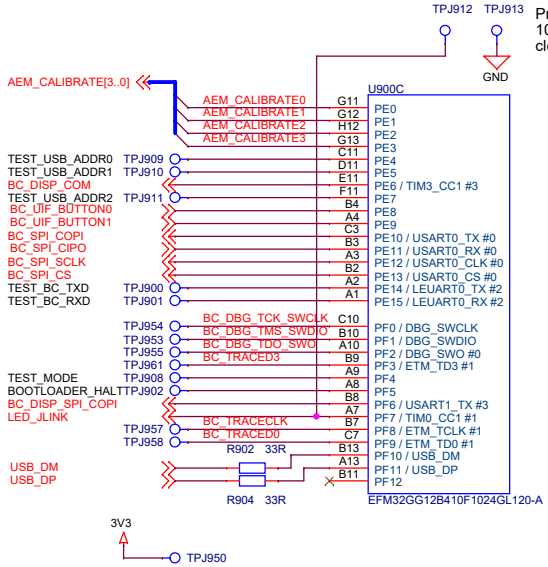
Page Title: **Power**

Board Number: **BRD2201B**

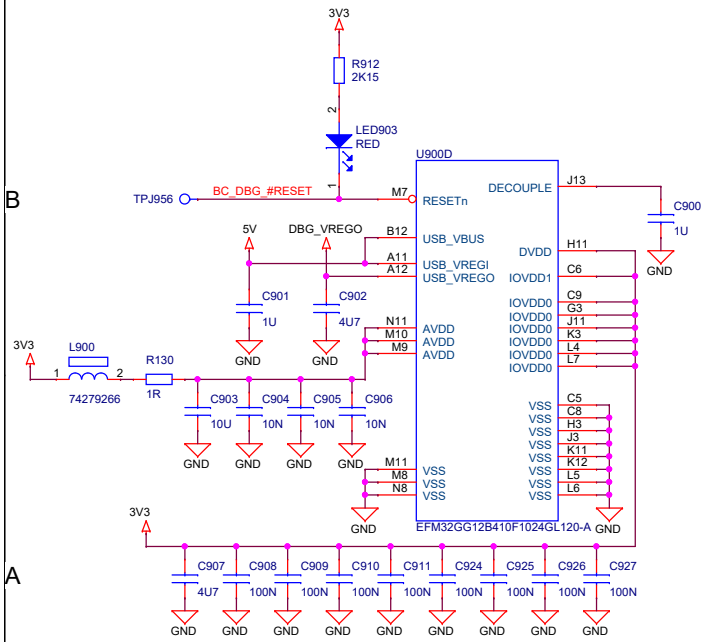
Revision: **A02**

Board Controller

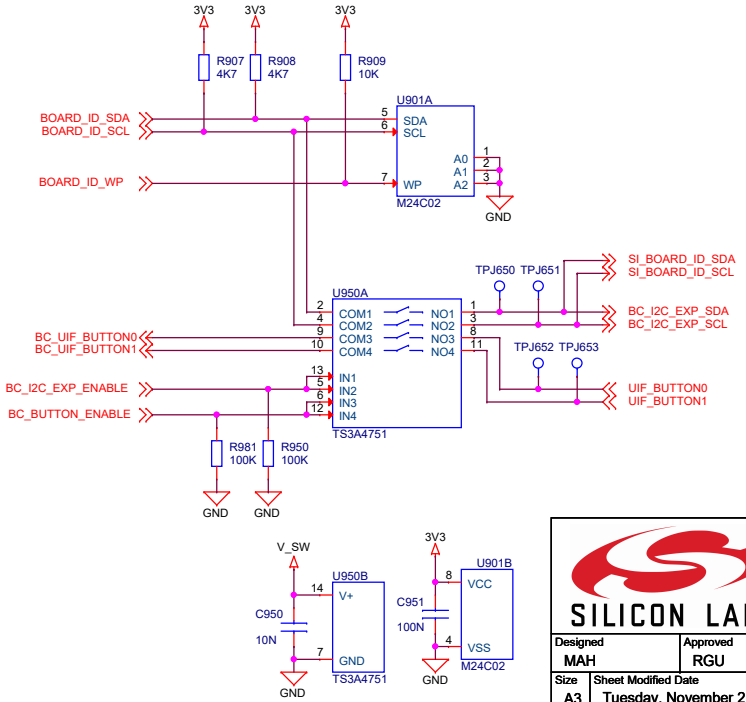




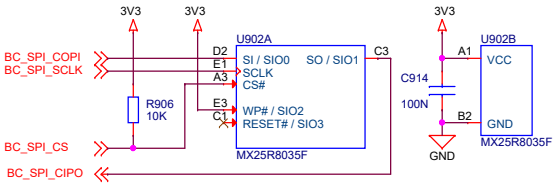
Power & Decoupling



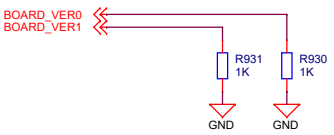
Board ID & Button Isolation



BC Serial Flash



Board Version



SILICON LABS

Designed	MAH
Approved	RGU
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Board Name
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Board Controller

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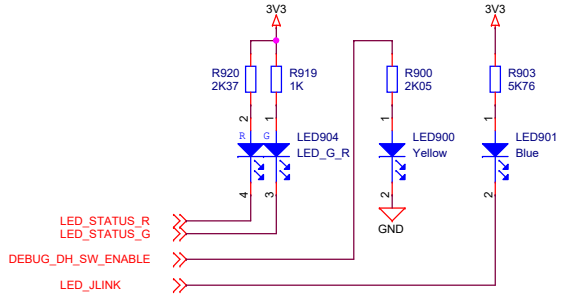
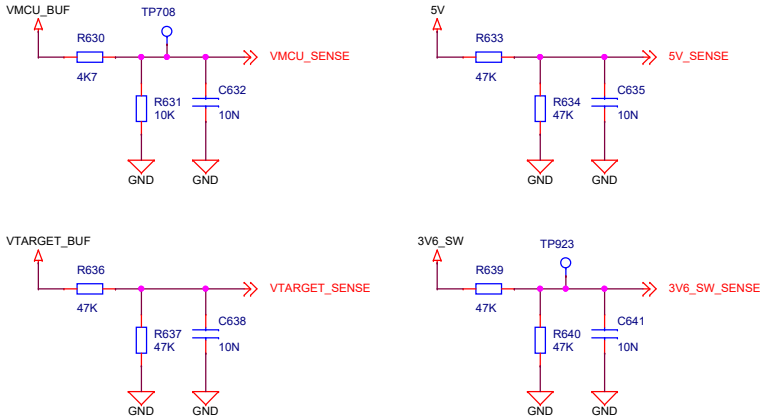
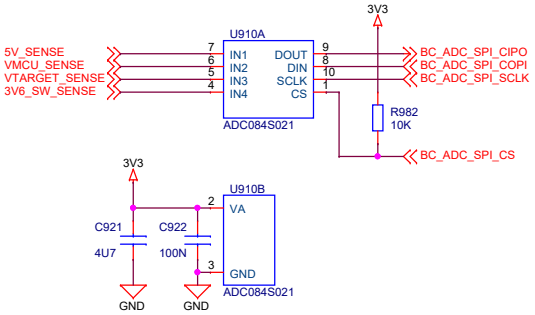
Indicator LEDs



BC Voltage Sense



BC Voltage Sense ADC



Board Name	**EFM32 Leopard Gecko Starter Kit**
Page Title	**Board Controller Misc**
Designed: MAH / Approved: RGU	
Size: A3 / Sheet Modified Date: Tuesday, November 21, 2023	
Board Number: **BRD2201B**	Revision: **A02**
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