## PG28 Pro Kit



## Revision History

| Rev. | Description |
|---|---|
| A01 | Initial version. |

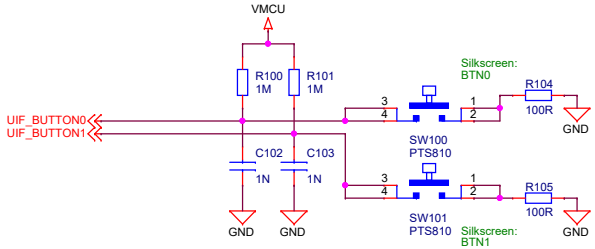
PCB1

PCB2506A

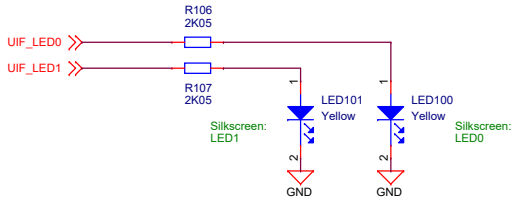


| | |
|---|---|
| Designed: DDC | Approved: RGU |
| Size: A3 | Sheet Modified Date: Monday, January 09, 2023 |
| Board Name: **EFM32PG28 Pro Kit** | |
| Page Title: **Title Page** | |
| Board Number: **BRD2506A** | Revision: **A01** |
| | Sheet: 1 of 13 |

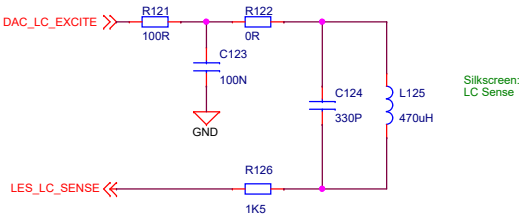
## Push Buttons



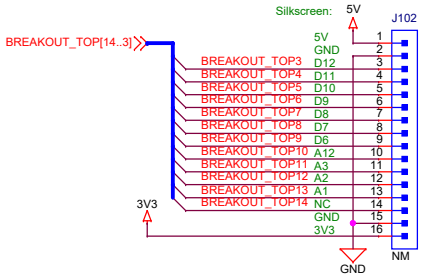

## LEDs

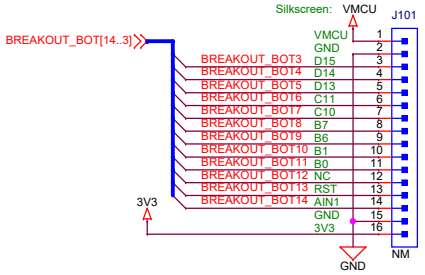



## LESENSE LC-Sensor




## Breakout Pads

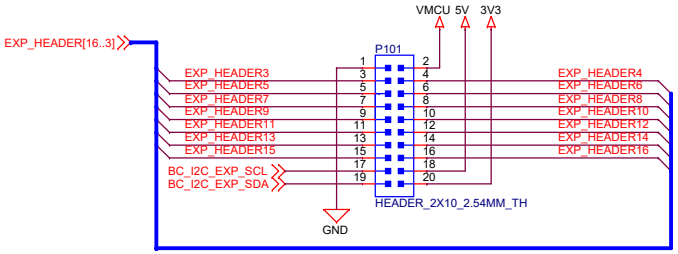


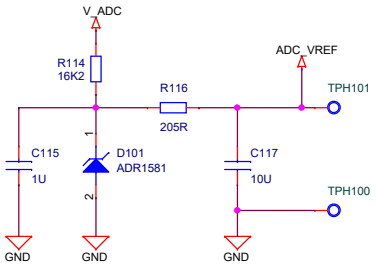

## EXP Header

EXP Header Functionality

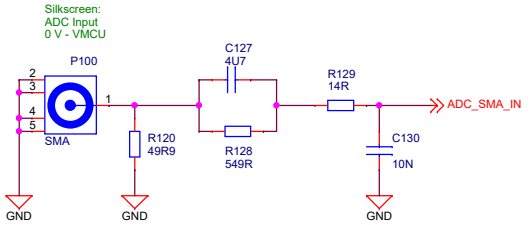
| Bottom Row | | | Top Row | | |
|---|---|---|---|---|---|
| 1 | GND | | 2 | VMCU | |
| 3 | AIN1 | | 4 | D11 | SPI_MOSI |
| 5 | B0 | GPIO | 6 | D12 | SPI_MISO |
| 7 | B7 | GPIO | 8 | D13 | SPI_CLK |
| 9 | B1 | GPIO | 10 | D14 | SPI_CS |
| 11 | NC | | 12 | D7 | UART_TX |
| 13 | C11 | GPIO | 14 | D8 | UART_RX |
| 15 | D10 | I2C_SCL | 16 | D9 | I2C_SDA |
| 17 | Reserved for EXP Board Identification | | 18 | 5V | |
| 19 | Reserved for EXP Board Identification | | 20 | 3V3 | |



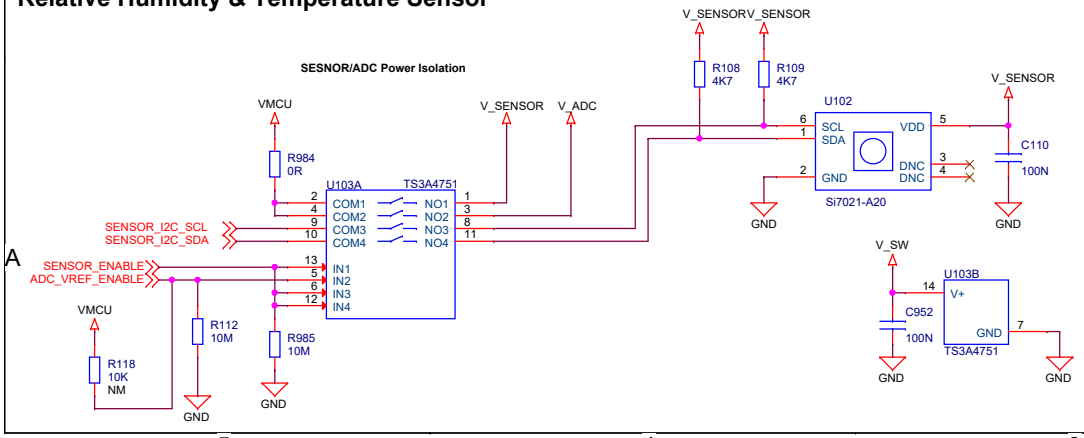

## ADC VREF




## SMA Connector

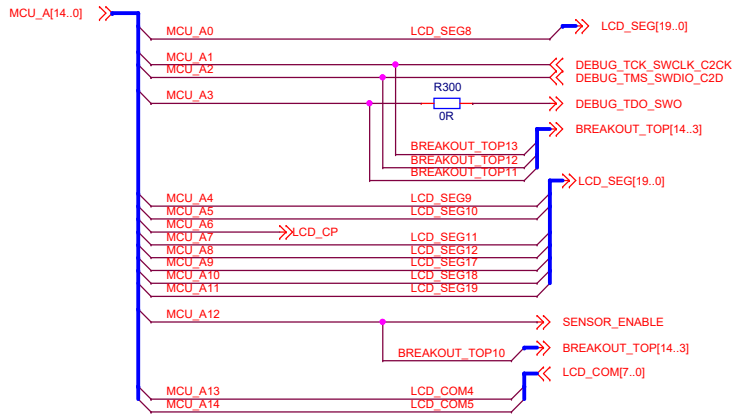



## Relative Humidity & Temperature Sensor

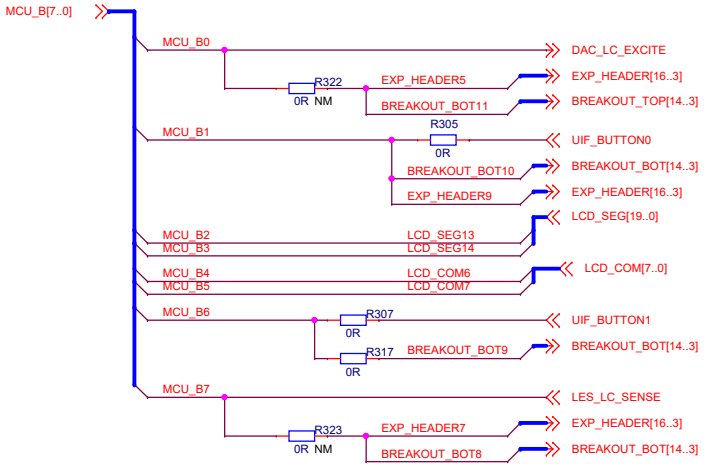



| | |
|---|---|
| Board Name | **EFM32PG28 Pro Kit** |
| Page Title | **User Interface** |
| Designed: DDC / Approved: RGU | |
| Size: A3 / Sheet Modified Date: Wednesday, January 04, 2023 | |
| Board Number: **BRD2506A** | Revision: **A01** |
| Sheet: 2 of 13 | |

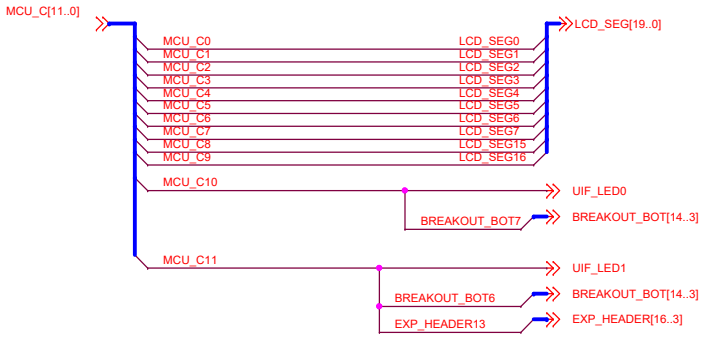
## PA Connections



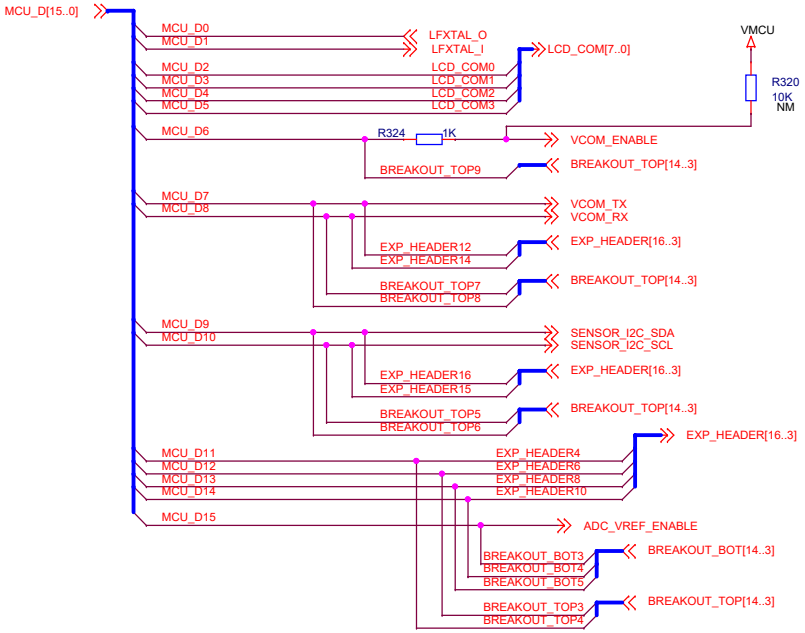

## PB Connections



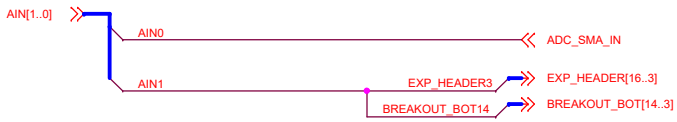

## PC Connections




## PD Connections




## ADC Connections




SILICON LABS

| | |
|---|---|
| Designed: DDC | Approved: RGU |
| Size: A3 | Sheet Modified Date: Wednesday, January 04, 2023 |

Board Name: **EFM32PG28 Pro Kit**

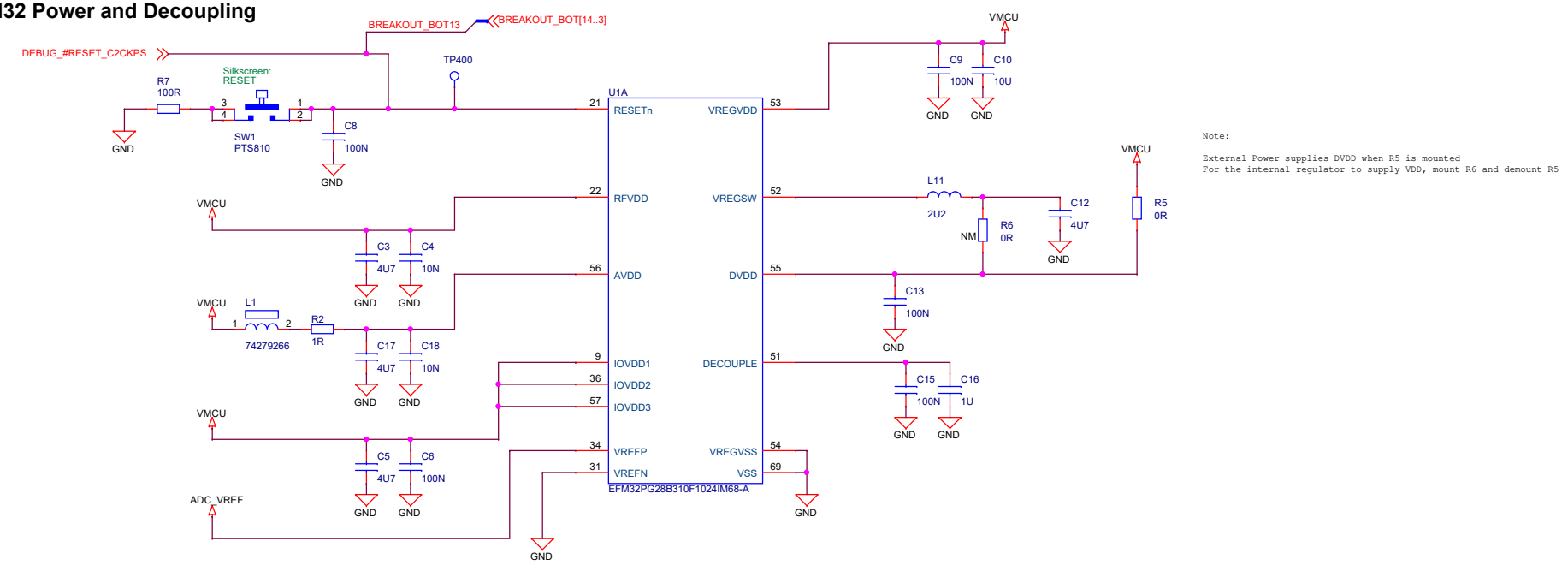
Page Title: **Signal Assignments**

Board Number: **BRD2506A**

Revision: **A01**

Sheet: 3 of 13

## EFM32 Power and Decoupling

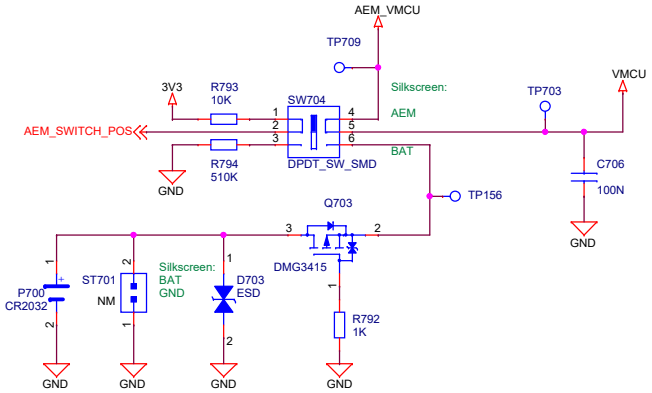



Note:

External Power supplies DVDD when R5 is mounted
For the internal regulator to supply VDD, mount R6 and demount R5

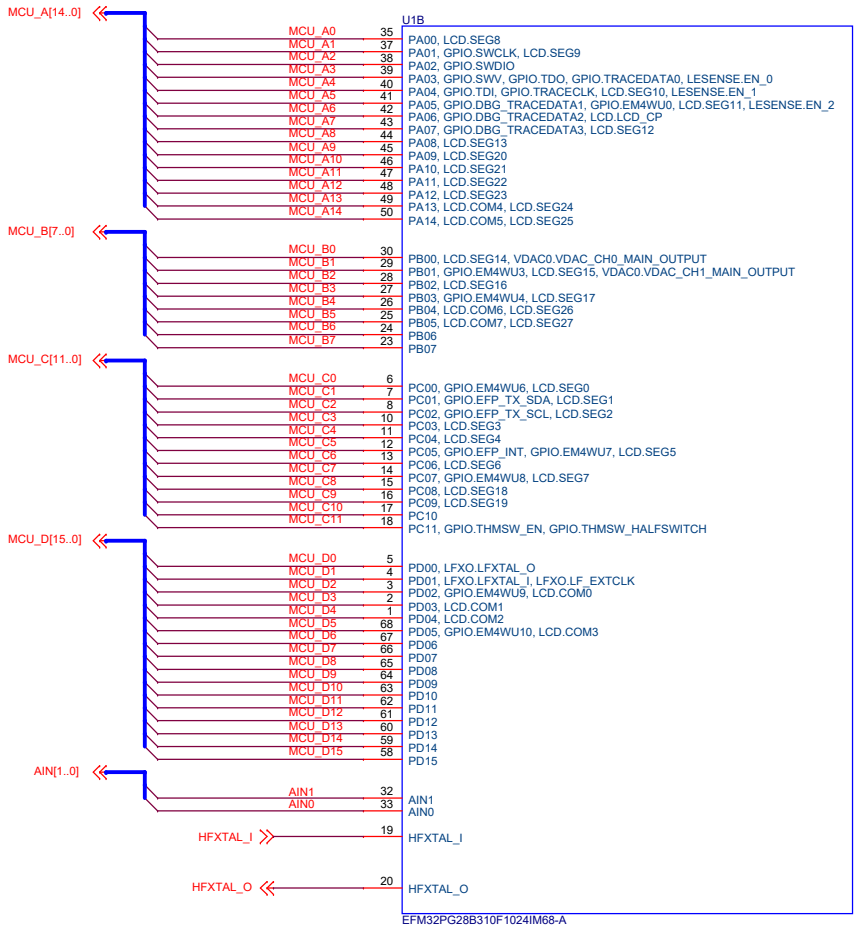
## Power Select Switch: AEM/BAT

| 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 coin-cell battery or external power supply |

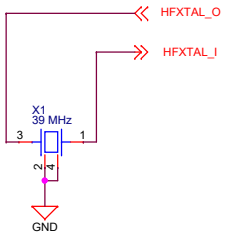



| | |
|---|---|
| Board Name | EFM32PG28 Pro Kit |
| Page Title | EFM32 Power |
| Designed | DDC |
| Approved | RGU |
| Board Number | BRD2506A |
| Revision | A01 |
| Size | A3 |
| Sheet Modified Date | Tuesday, January 03, 2023 |
| Sheet | 4 of 13 |

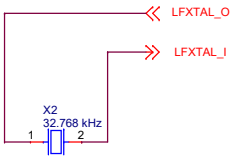
## EFM32 MCU




### High Frequency Clock




### Low Frequency Clock




SILICON LABS

| | |
|---|---|
| Designed: DDC | Approved: RGU |
| Size: A3 | Sheet Modified Date: Tuesday, January 03, 2023 |

Board Name: **EFM32PG28 Pro Kit**

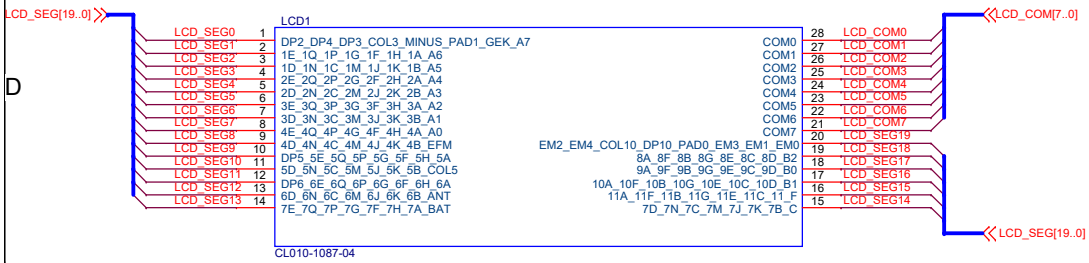
Page Title: **EFM32 I/O**

Board Number: **BRD2506A**

Revision: **A01**

Sheet: 5 of 13

## Segment LCD Signal Connections



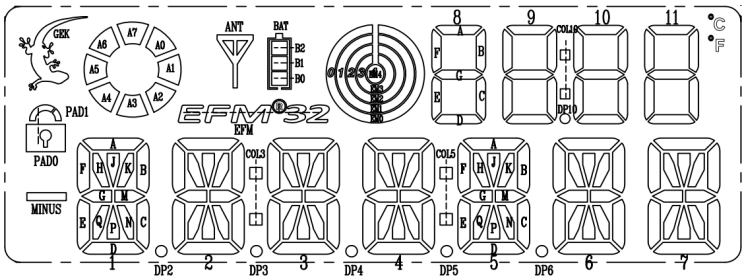

Segement LCD Pin Mapping

| Signal Name | MCU Net Name | MCU Peripheral Name |
|---|---|---|
| COM0 | PD02 | LCD.COM0 |
| COM1 | PD03 | LCD.COM1 |
| COM2 | PD04 | LCD.COM2 |
| COM3 | PD05 | LCD.COM3 |
| COM4 | PA13 | LCD.COM4 |
| COM5 | PA14 | LCD.COM5 |
| COM6 | PB04 | LCD.COM6 |
| COM7 | PB05 | LCD.COM7 |
| S0 | PC00 | LCD.SEG0 |
| S1 | PC01 | LCD.SEG1 |
| S2 | PC02 | LCD.SEG2 |
| S3 | PC03 | LCD.SEG3 |
| S4 | PC04 | LCD.SEG4 |
| S5 | PC05 | LCD.SEG5 |
| S6 | PC06 | LCD.SEG6 |
| S7 | PC07 | LCD.SEG7 |
| S8 | PA00 | LCD.SEG8 |
| S9 | PA04 | LCD.SEG10 |
| S10 | PA05 | LCD.SEG11 |
| S11 | PA07 | LCD.SEG12 |
| S12 | PA08 | LCD.SEG13 |
| S13 | PB02 | LCD.SEG16 |
| S14 | PB03 | LCD.SEG17 |
| S15 | PC08 | LCD.SEG18 |
| S16 | PC09 | LCD.SEG19 |
| S17 | PA09 | LCD.SEG20 |
| S18 | PA10 | LCD.SEG21 |
| S19 | PA11 | LCD.SEG22 |
| LCD_CP | PA06 | LCD.LCD_CP |

## LCD Boost


| 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: DDC | Approved: RGU |
| Size: A3 | Sheet Modified Date: Tuesday, January 03, 2023 |

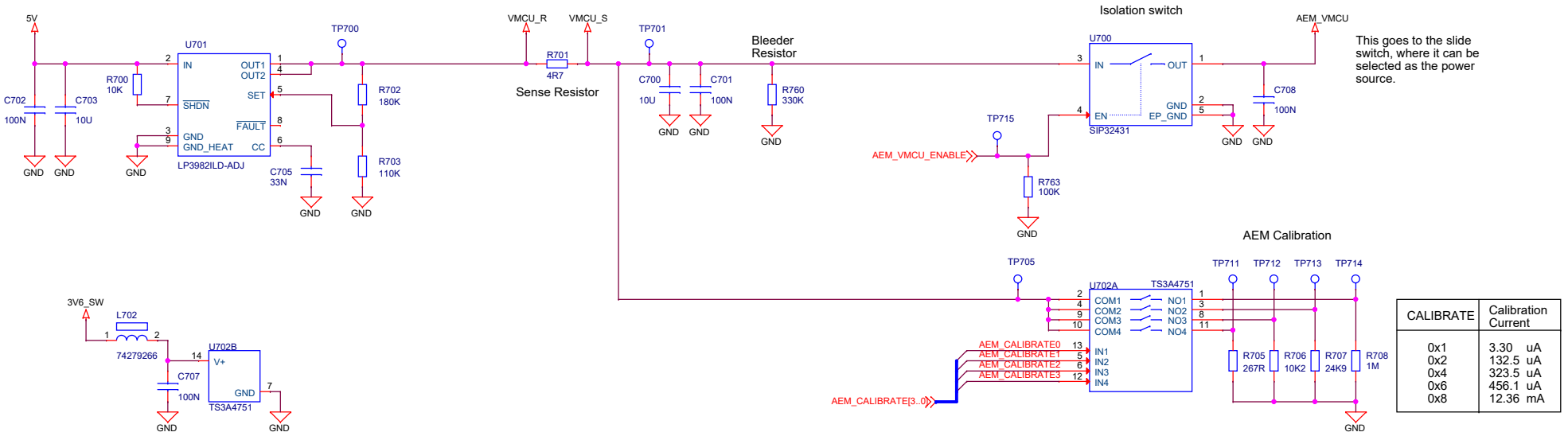
Board Name: **EFM32PG28 Pro Kit**

Page Title: **Segment LCD**

Board Number: **BRD2506A**

Revision: **A01**

# MCU Power Regulator




| CALIBRATE | Calibration Current |
|---|---|
| 0x1 | 3.30 uA |
| 0x2 | 132.5 uA |
| 0x4 | 323.5 uA |
| 0x6 | 456.1 uA |
| 0x8 | 12.36 mA |

SILICON LABS

| | |
|---|---|
| Designed: DDC | Approved: RGU |
| Size: A3 | Sheet Modified Date: Thursday, January 05, 2023 |

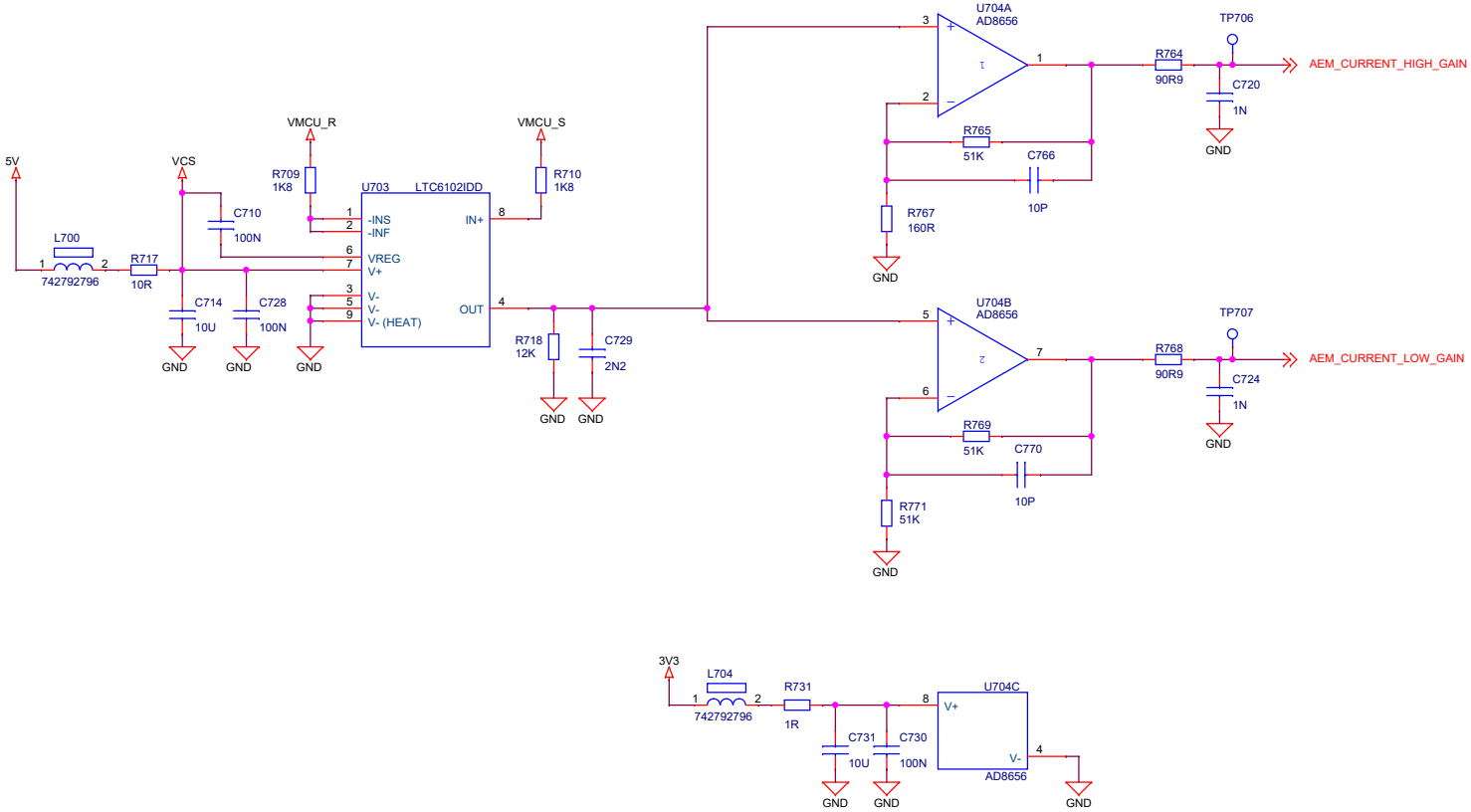
Board Name: **EFM32PG28 Pro Kit**

Page Title: **Target Voltage Supply**

Board Number: **BRD2506A**

Revision: **A01**

## MCU Current Sense

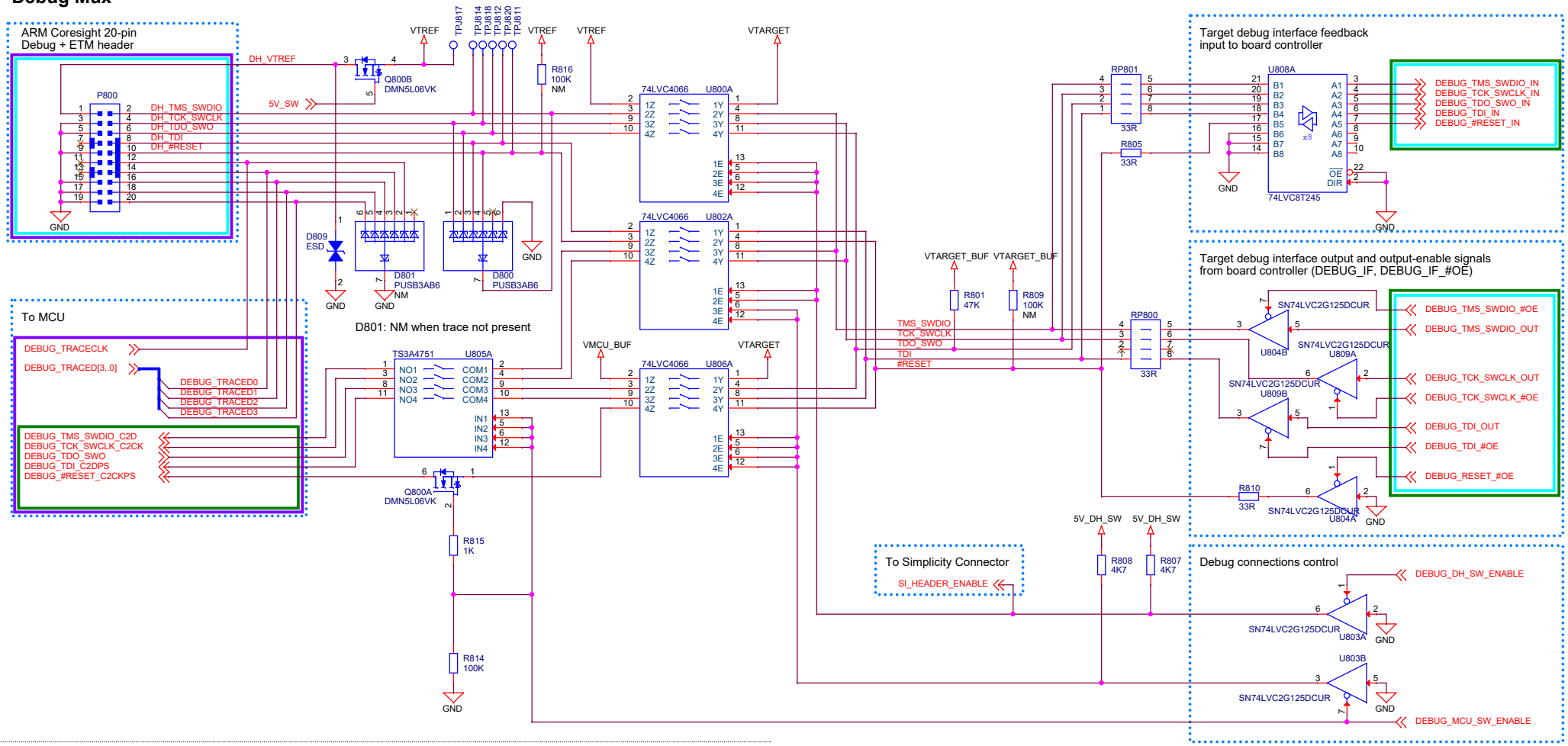




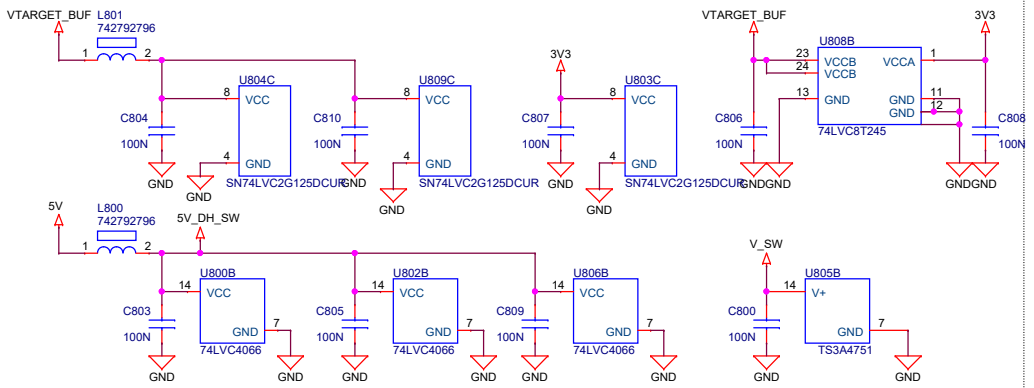


| | |
|---|---|
| Board Name | **EFM32PG28 Pro Kit** |
| Page Title | **AEM** |
| Designed: DDC / Approved: RGU | |
| Size: A3 / Sheet Modified Date: Tuesday, January 03, 2023 | Board Number: **BRD2506A** / Revision: **A01** |
|  | Sheet: 8 of 13 |

## Debug Mux




## Power & Decoupling




| Mode | DEBUG_DH_SW_ENABLE | DEBUG_MCU_SW_ENABLE | DEBUG_IF_#OE | VTREF | VTARGET |
|---|---|---|---|---|---|
| Debug Out | 1 | 0 | 0/1 | External voltage | External voltage |
| MCU Debug | 0 | 1 | 0/1 | Disconnected | VMCU |
| Debug In | 1 | 1 | 1 | VMCU | VMCU |
| Debug Off | 0 | 0 | 1 | - | - |

Color coded frames indicates which groups of
signal nodes that are active in a given debug mode

SILICON LABS

| | |
|---|---|
| Designed | DDC |
| Approved | RGU |
| Size | A3 |
| Sheet Modified Date | Tuesday, January 03, 2023 |

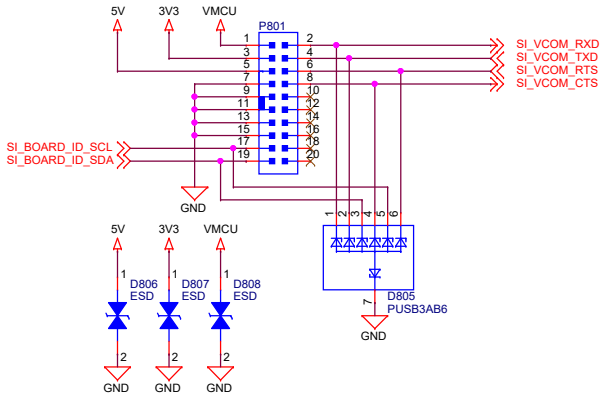
Board Name
**EFM32PG28 Pro Kit**

Page Title
**Debug Interface**

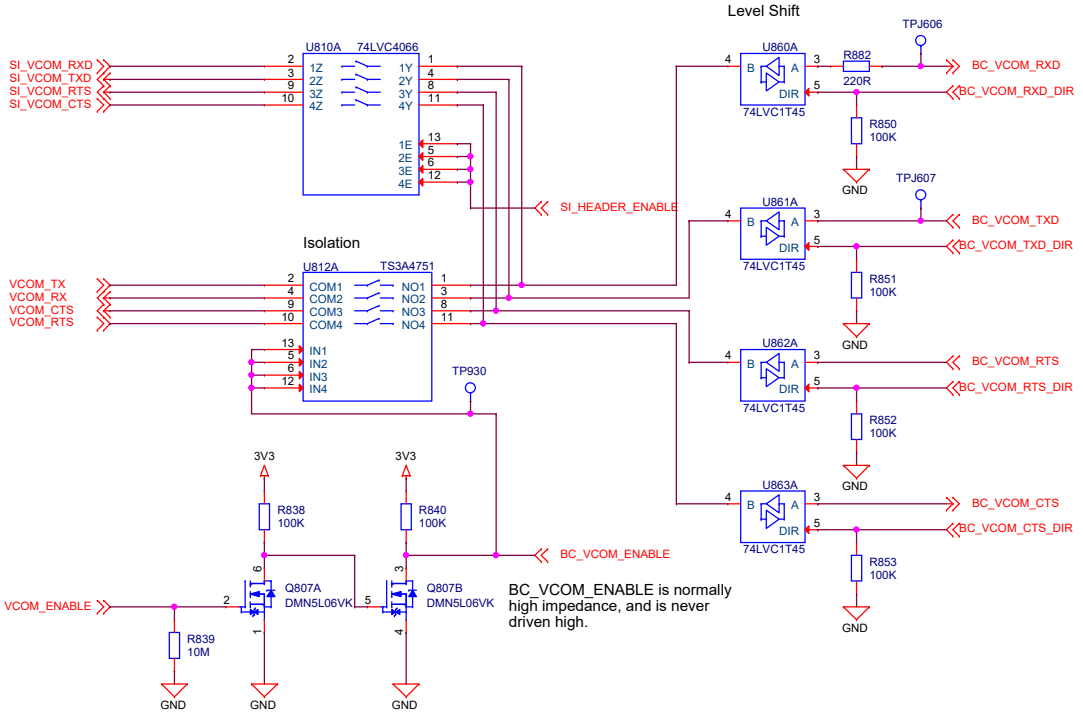
Board Number
**BRD2506A**

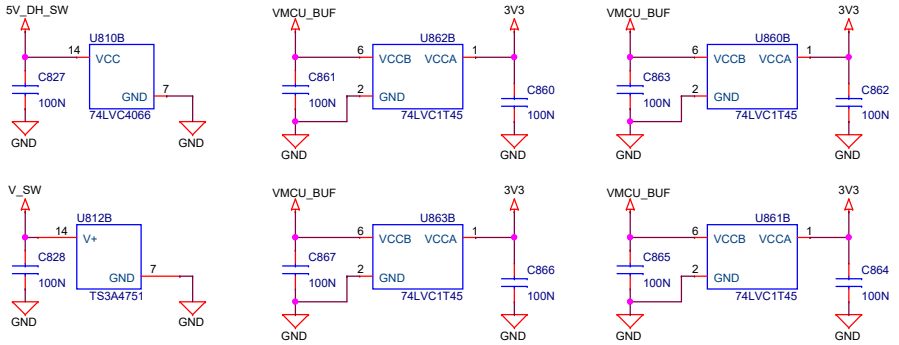
Revision
**A01**

## Simplicity Connector



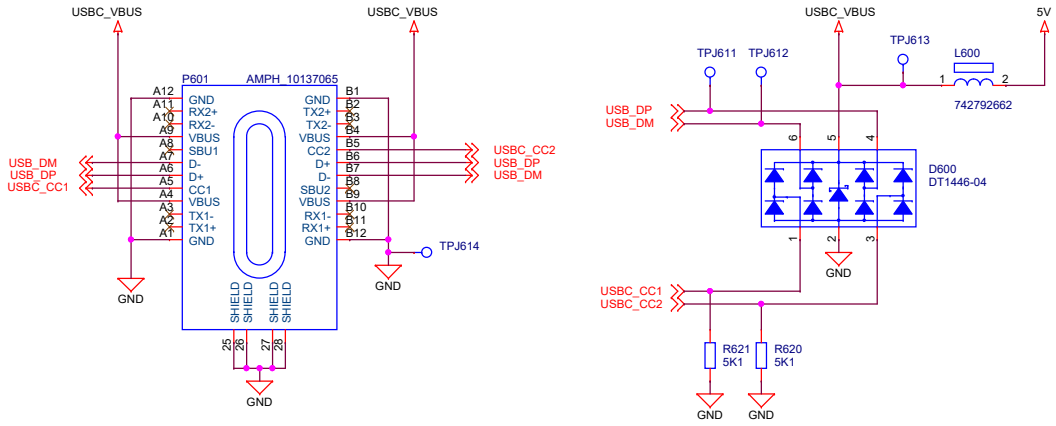

## VCOM Interface



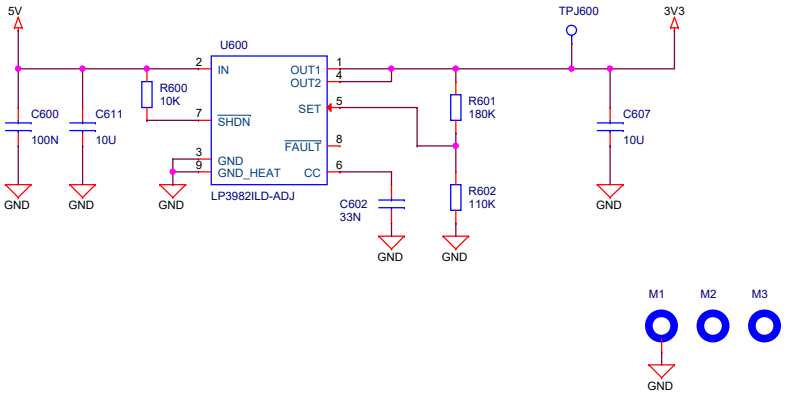




| | |
|---|---|
| Board Name | **EFM32PG28 Pro Kit** |
| Page Title | **Simplicity & VCOM** |
| Designed: DDC / Approved: RGU | |
| Size: A3 / Sheet Modified Date: Tuesday, January 03, 2023 | Board Number: **BRD2506A** / Revision: **A01** |
| Sheet: 10 of 13 | |

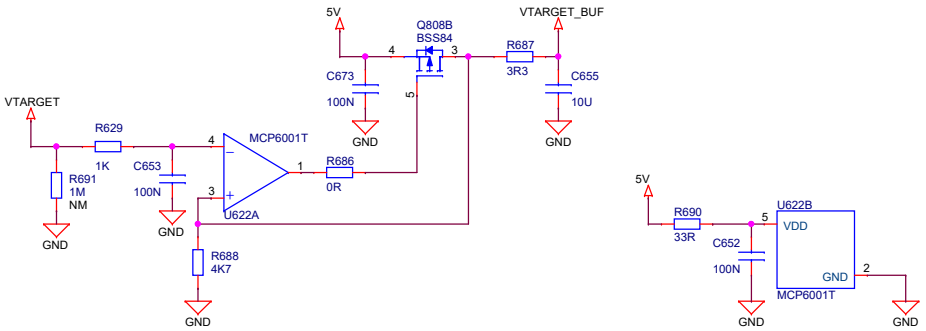
## J-Link USB Port




## 3V3 Regulator



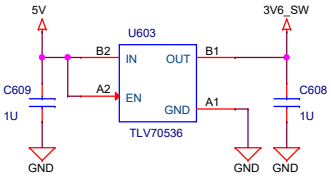

## VTarget Voltage Mirror

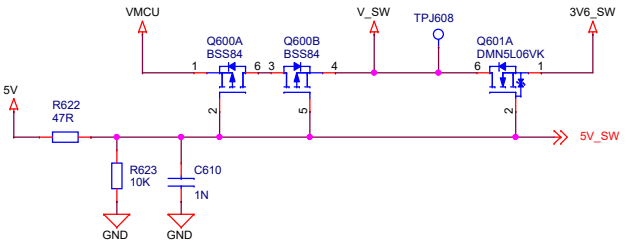



## Power Supply for Analog Switches

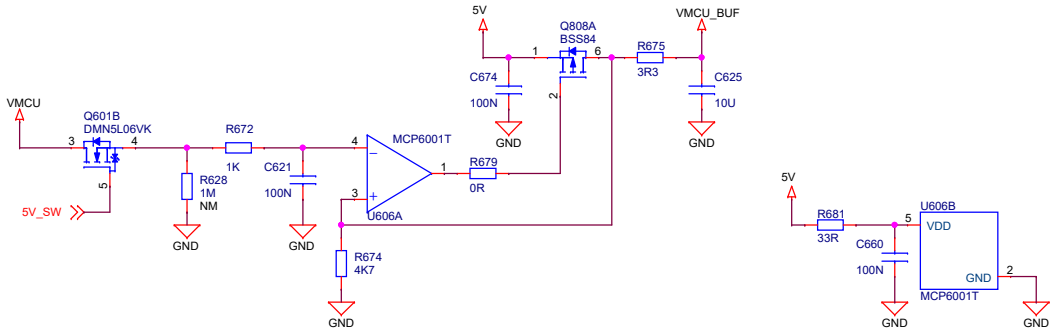
Analog switches used for isolation are powered by 3V6_SW when the USB cable is connected, otherwise by VMCU.

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



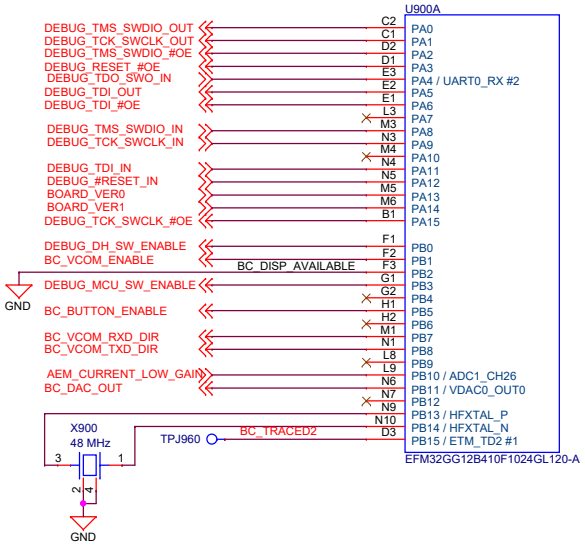



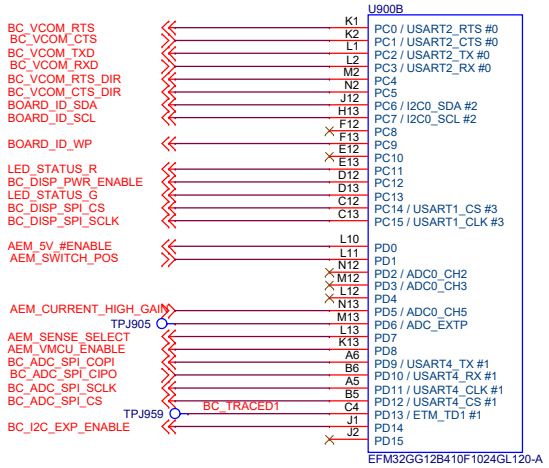

## VMCU Voltage Mirror

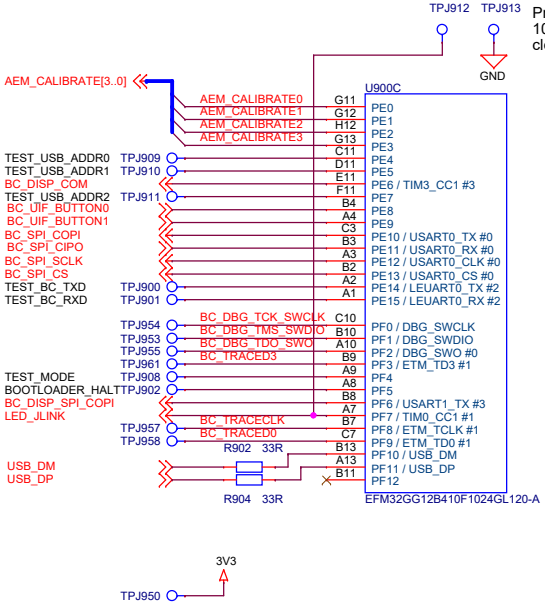



| | |
|---|---|
| Board Name | **EFM32PG28 Pro Kit** |
| Page Title | **Power** |
| Designed: DDC / Approved: RGU | |
| Size: A3 / Sheet Modified Date: Thursday, January 05, 2023 | |
| Board Number: **BRD2506A** | Revision: **A01** |
| Sheet: 11 of 13 | |

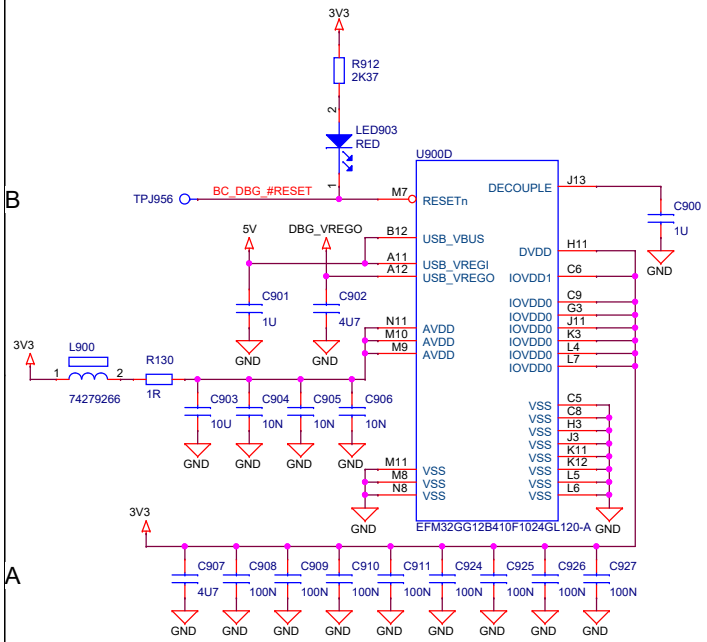
## Board Controller



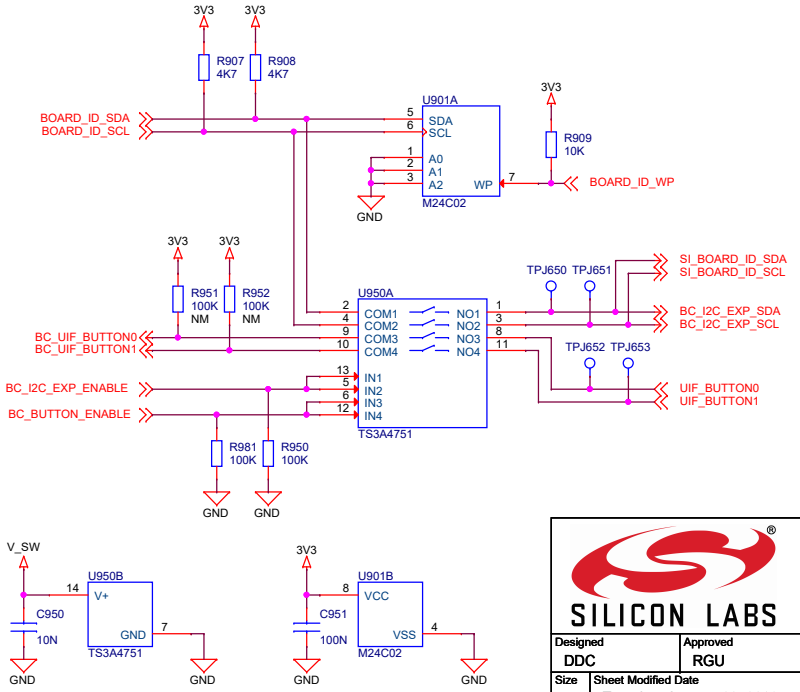




## Power & Decoupling



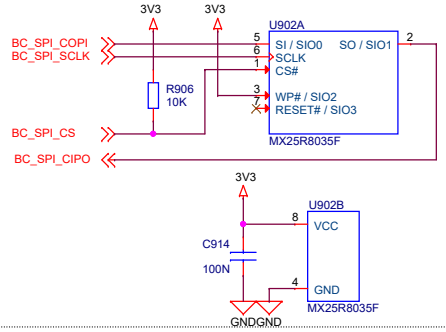

## Board ID & Button Isolation



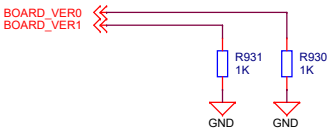




## BC Serial Flash




## Board Version




SILICON LABS

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|---|---|
| Designed: DDC | Approved: RGU |
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Board Name: **EFM32PG28 Pro Kit**

Page Title: **Board Controller**

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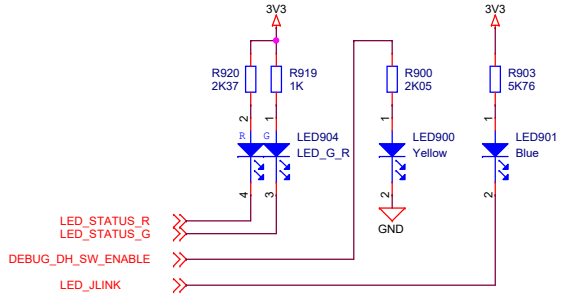
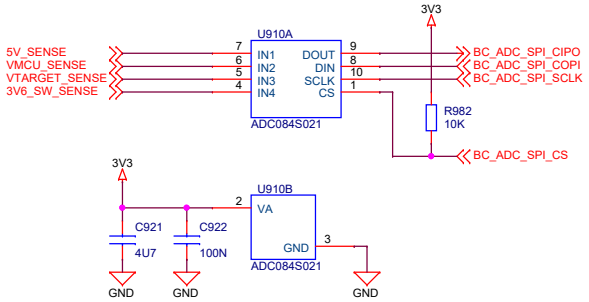
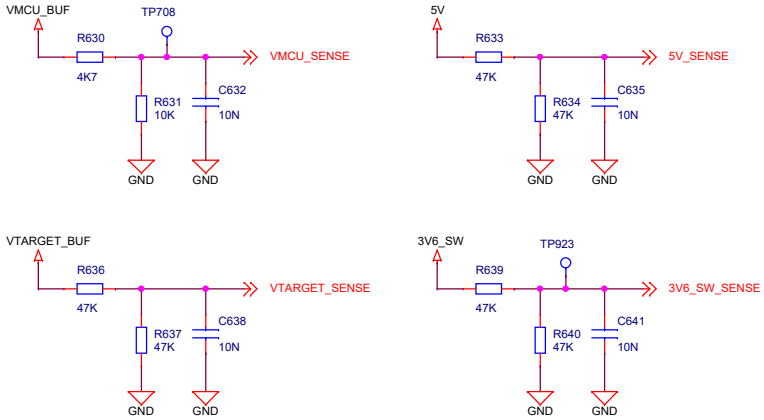
## Indicator LEDs




## BC Voltage Sense ADC




## BC Voltage Sense

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| Board Name | **EFM32PG28 Pro Kit** |
| Page Title | **Board Controller Misc** |
| Designed: DDC / Approved: RGU | |
| Size: A3 / Sheet Modified Date: Tuesday, January 03, 2023 | Board Number: **BRD2506A** / Revision: **A01** |
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