

EFM32 Zero Gecko STK

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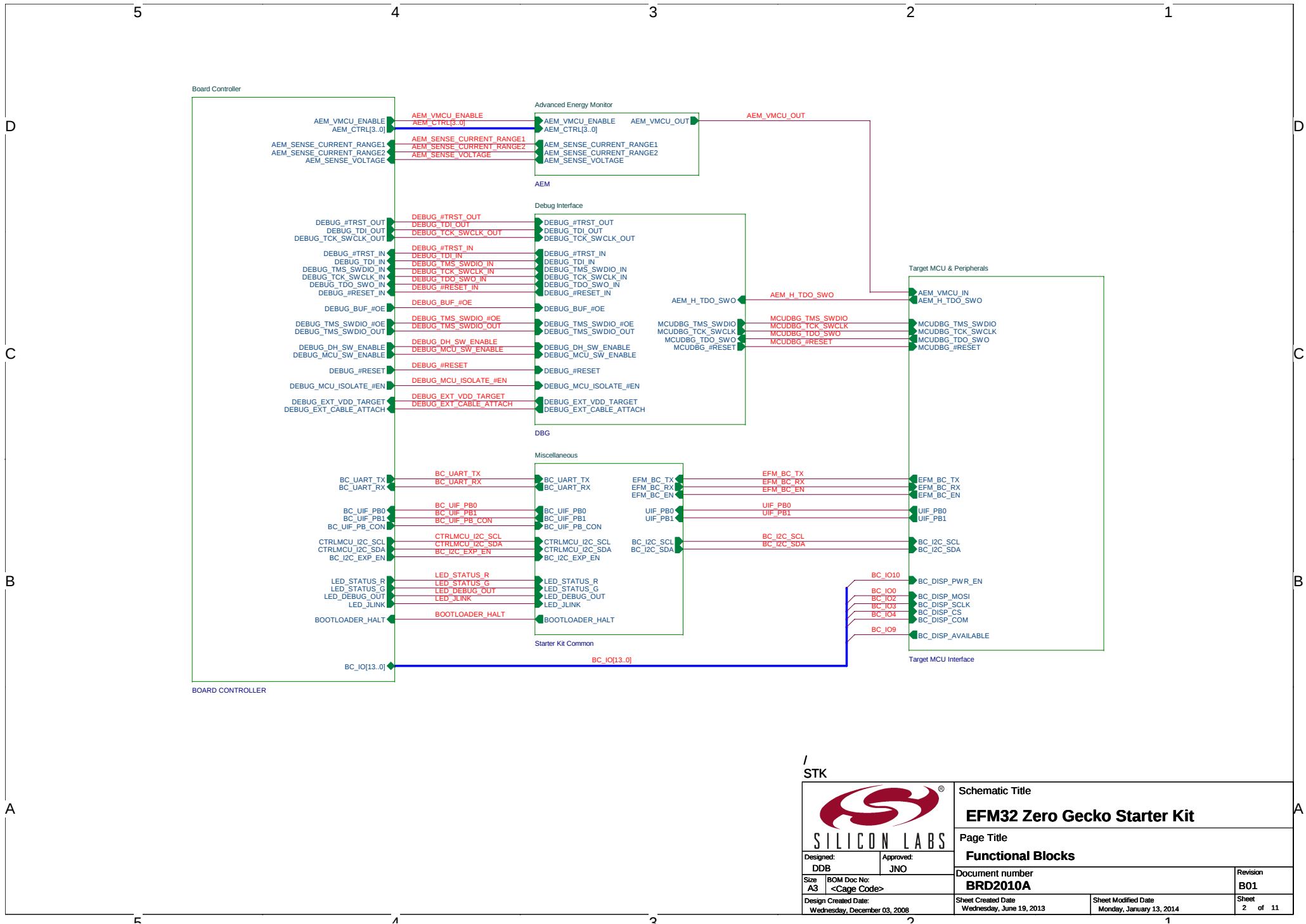
Revision History

Rev.	Description
PB10	Added 3V6_SENSE. Added TPJ608. Changed TP703 to TPJ703.
PB11	Swapped BC_DISP_COM from BC_IO1 to BC_IO4.
PB12	Swapped EXP Header pins 15 and 17. Moved TPJ606 and TPJ607.
PB13	Extended CTRLMCU_I2C bus to EXP Header. Added EFM_DISP_PWR_EN signal.
B00	Initial release for series production.
B01	Changed U603 from LD6806 to TLV70536.

STK

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STK

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Breakout Connections

The left diagram shows the wiring for J101. MCU pins are connected to breakout board pins as follows: MCU_PE10 to 6, MCU_PE11 to 7, MCU_PE12 to 8, MCU_PE13 to 9, MCU_PC0 to 11, MCU_PC1 to 12, MCU_PC2 to 13, MCU_PC13 to 14, MCU_PC14 to 15, MCU_PC15 to 16, MCU_PA0 to 17, MCU_PA8 to 19, and MCU_PA8 to 20. Power connections include 3V3 to 1, VMCU 5V to 2, and GND to 23. The right diagram shows the wiring for J102. MCU pins are connected to breakout board pins as follows: MCU_PF2 to 5, MCU_PF3 to 6, MCU_PF4 to 7, MCU_PF5 to 8, MCU_PC8 to 9, MCU_PC9 to 10, MCU_PC10 to 11, MCU_PC11 to 12, MCU_P04 to 13, MCU_P05 to 14, MCU_P06 to 15, MCU_P07 to 16, MCU_P08 to 17, MCU_P09 to 18, MCU_PA1 to 19, and MCU_PA2 to 20. Power connections include 3V3 to 1, VMCU 5V to 2, and GND to 23.

The diagram illustrates the layout of touch pads on a PCB. The top view (left) shows two circular pads, T1 and T2, connected to a microcontroller (J100) via traces labeled TOUCH. The bottom view (right) shows the same pads with a central 'No Ground' area (white) and a surrounding 'Full Ground' area (green). Dimensions D and A are indicated for the pads.

Touch Pads

Top View: T1, T2, TOUCH, J100, NM, 1, 2, UIF_TOUCH0, UIF_TOUCH1.

Bottom View: Ground, No Ground, Full Ground.

Dimensions: D = 7-10 mm, bigger is better; A = 2.5 mm.

Only top layer shown. No ground on other layers below button or annular ring.

Trace should be taken to bottom layer with via at edge of button, keep traces short, away from power/noisy traces and route directly to efm32.

EXP port

The diagram illustrates the EXP port header (P100) with the following connections:

- EXP_HEADERS3** to **EXP_HEADERS15** are connected to pins 3 through 15 of the P100 header.
- BC_I2C_SCL** and **BC_I2C_SDA** are connected to pins 17 and 18 of the P100 header.
- VMCU 5V** is connected to pin 1 of the P100 header.
- 3V3** is connected to pin 2 of the P100 header.
- GND** is connected to pin 20 of the P100 header.
- HEADER_2X10_2.54MM_HOR_SMD** is connected to pin 19 of the P100 header.
- PD7** to **PD5** are connected to pins 4, 5, and 6 of the P100 header.
- PC15** to **PC12** are connected to pins 7, 8, 9, and 10 of the P100 header.
- PD4** to **PD5** are connected to pins 11, 12, 13, and 14 of the P100 header.
- PE12** is connected to pin 15 of the P100 header.

EXP-Header Functionality

Pin	Function	Signal
1	GND	
3	PC0	ACMP0_CH0
5	PC1	ACMP0_CH1
7	PC2	ACMP0_CH2
9	PA0	
11	PB11	IDACO_OUT
13	PA1	
15	PE13	I2CO_SCL
17	Reserved for EXP Board Identification	
19	Reserved for EXP Board Identification	

Pin	Function	Signal
2	VMCU	
4	PD7	US1_TX
6	PD6	US1_RX
8	PC15	US1_CLK
10	PC14	US1_CS
12	PD4	LEU0_TX
14	PD5	LEU0_RX
16	PE12	I2CO_SDA
18	5V	
20	3V3	

Memory LCD-TFT Display & Multiplexer

The schematic diagram illustrates the connection between the EFM32 microcontroller and the Memory LCD-TFT Display & Multiplexer. The circuit includes two multiplexers, U101A (TS3A24159) and U100A (TS3A44159), which route signals from the EFM32 to the display. U101A handles power and data bus signals, while U100A handles display control signals. The display is an LS13B7DH03 (25x4mm) connected to an XF2L-1025-1A_MEMPLCD. The circuit also includes various resistors (R109, R104, R110, R105) and capacitors (C1, C102, C103) for signal conditioning and timing. A truth table at the bottom defines the control signals for EFM and BC modes.

EFM_DISP_SELECT	DISP_CTRL	VDISP	BC_DISP_AVAILABLE
1	EFM	EFM_DISP_PWR_EN	0
0	BC	BC_DISP_PWR_EN	1

The EFM32 always controls ownership of the display

pushbuttons

VMCU

R101 1M R102 1M

SW100 1 2 3 4

R100 100R

GND

UIF_PB0 UIF_PB1

C100 1N C101 1N

SW101 1 2 3 4

R103 100R

GND

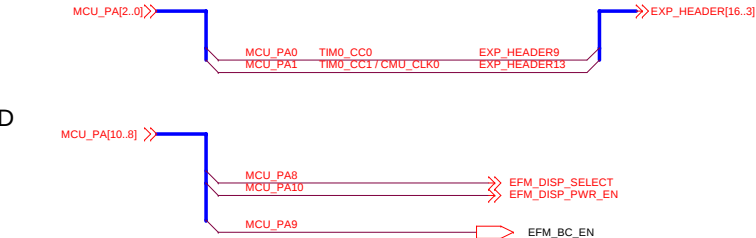
UIF_PB0 UIF_PB1

B

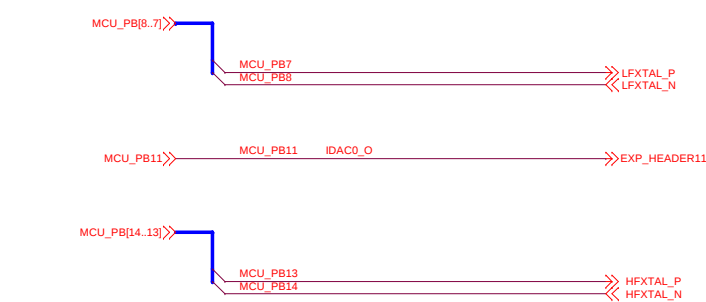
The diagram shows a circuit for controlling two LEDs, LED101 and LED100, which are both yellow. The LEDs are connected in series with resistors R107 and R108, both valued at 3K. The signal source is labeled `UIF_LED[1..0]`. The circuit is powered by a 5V supply and grounded to GND.

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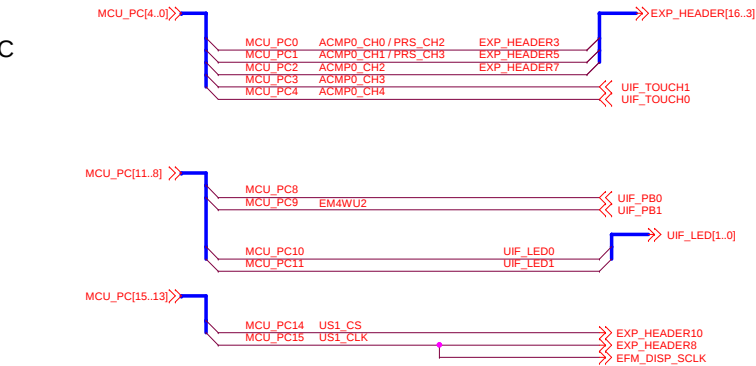
PA Connections



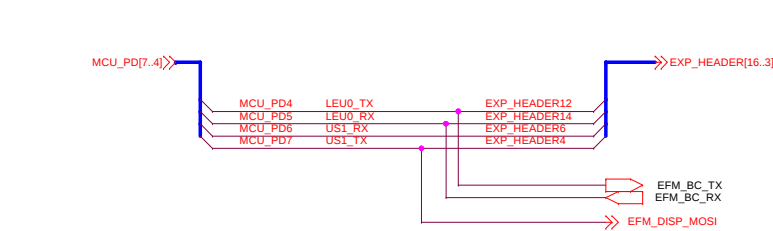
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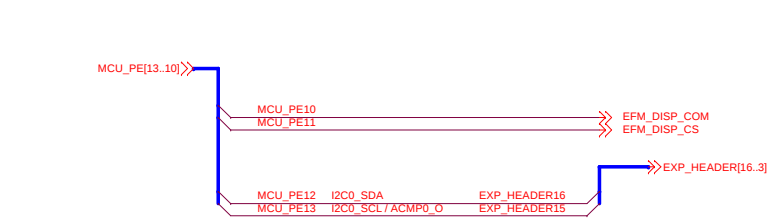
PC Connections



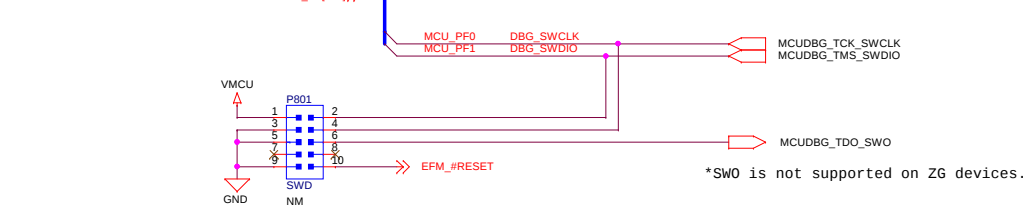
PD Connections



PE Connections

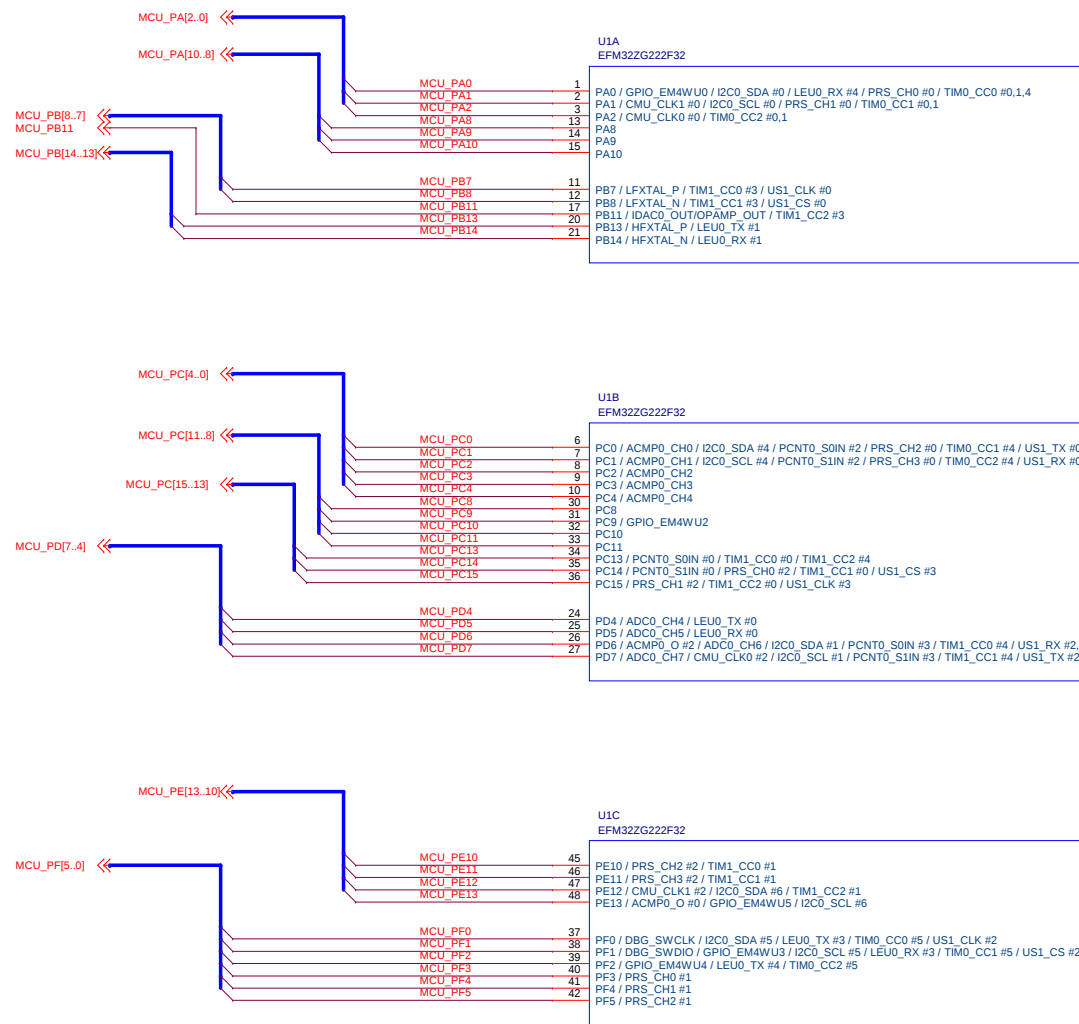


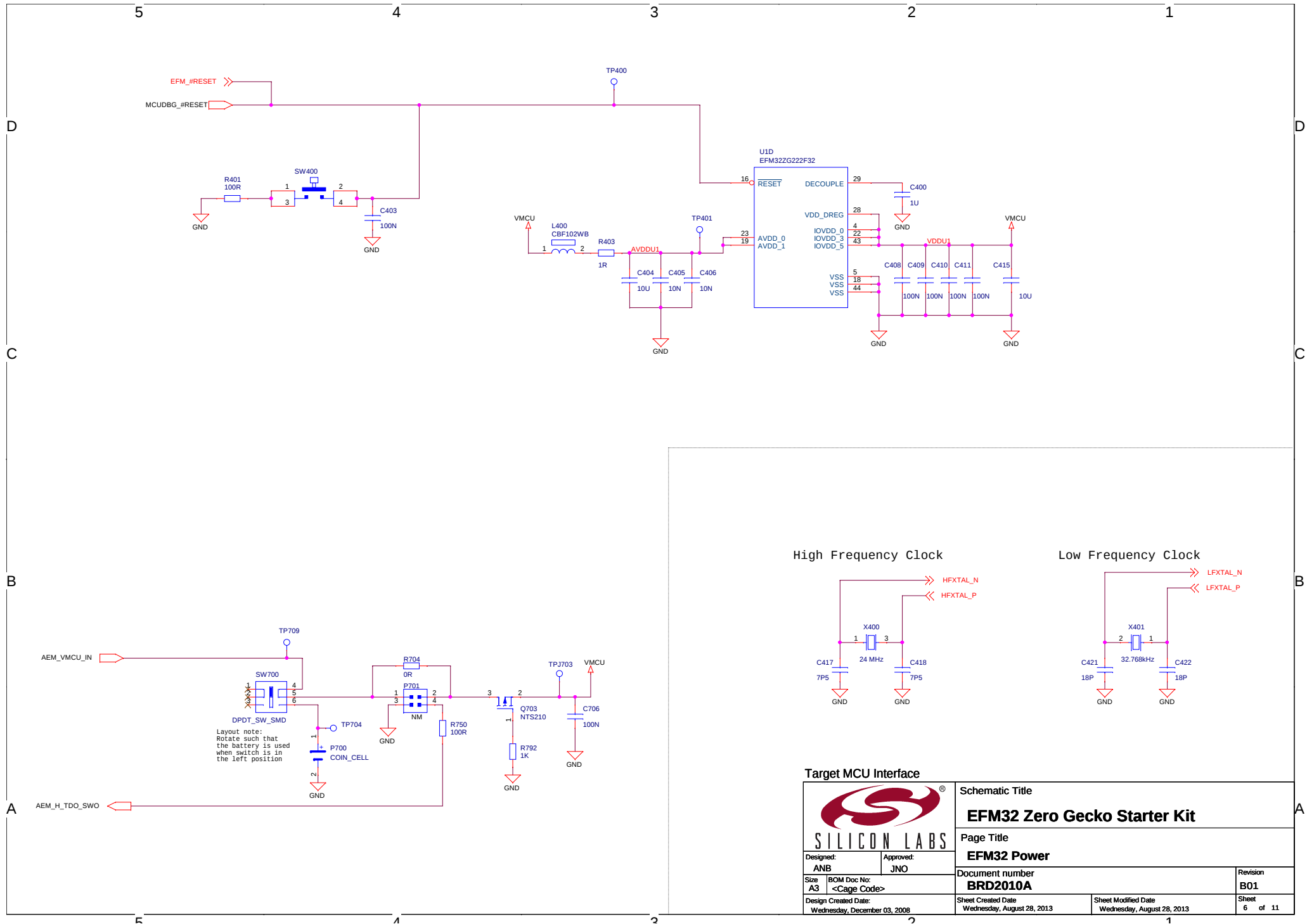
PF Connections



Target MCU Interface

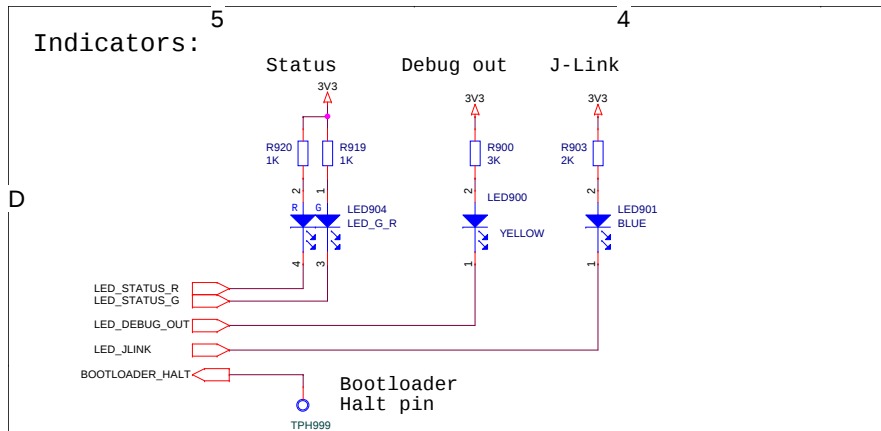
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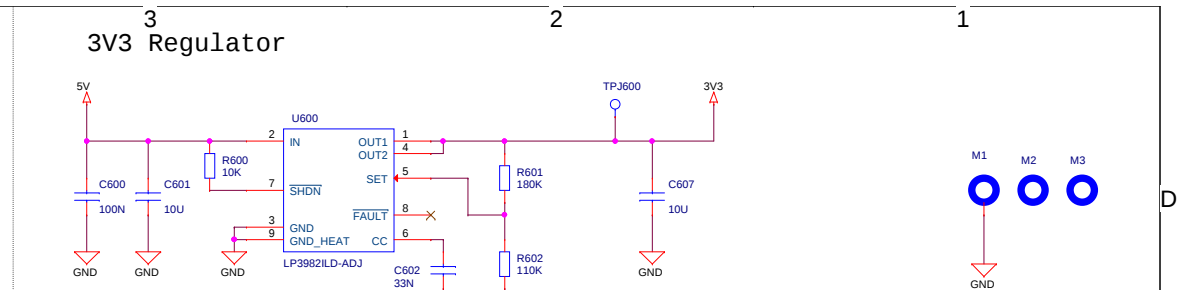
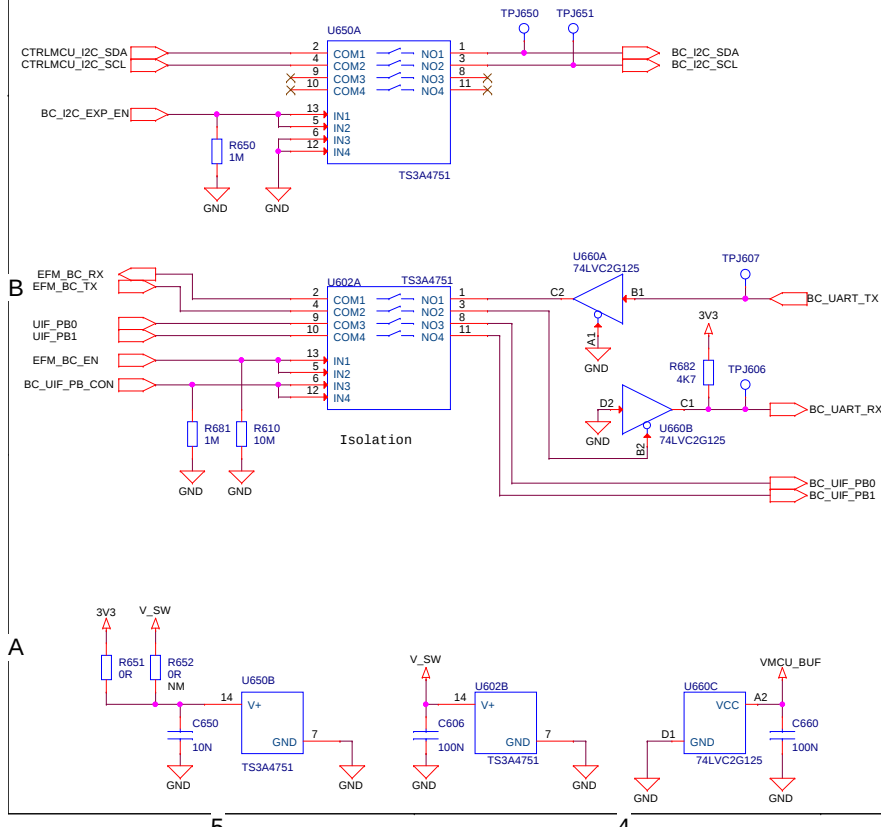


Target MCU Interface

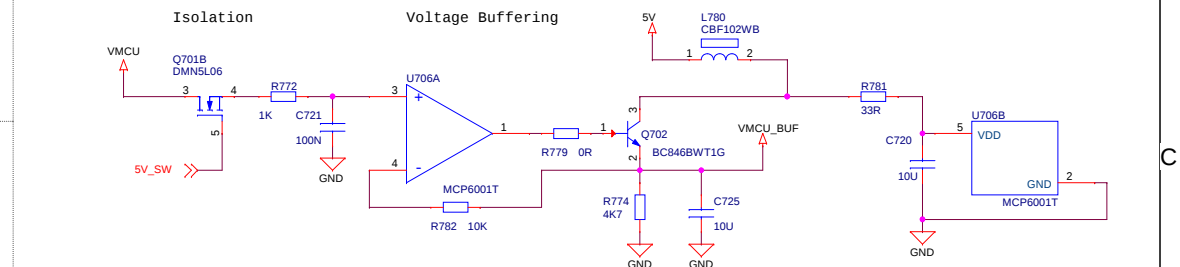
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Voltage Domain Isolation & Level Shift



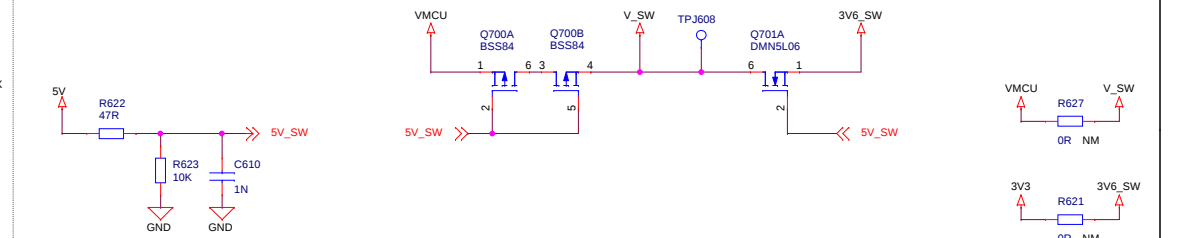
VMCU Voltage Mirror



Power Supply for Analog Switches

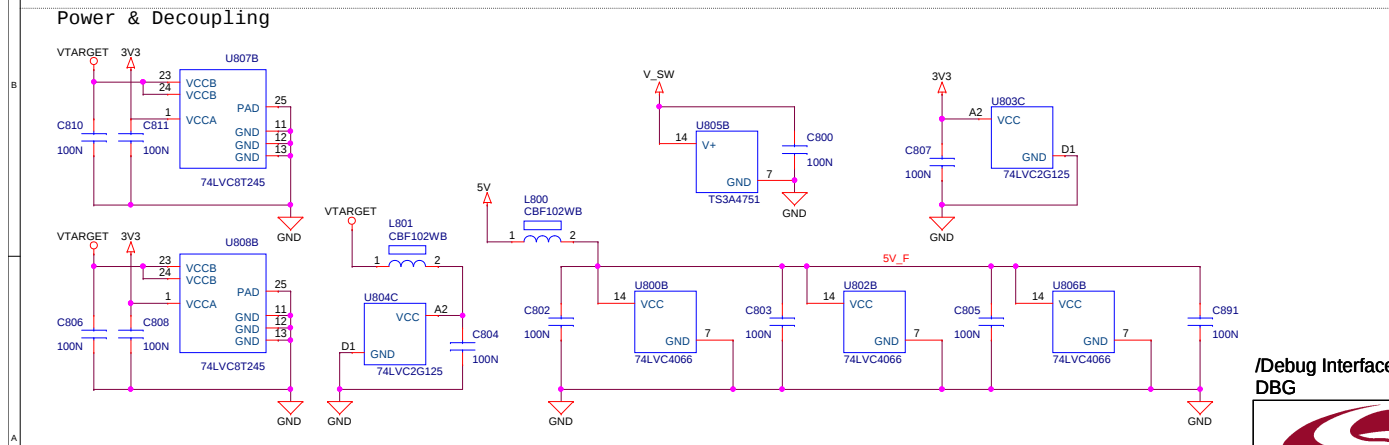
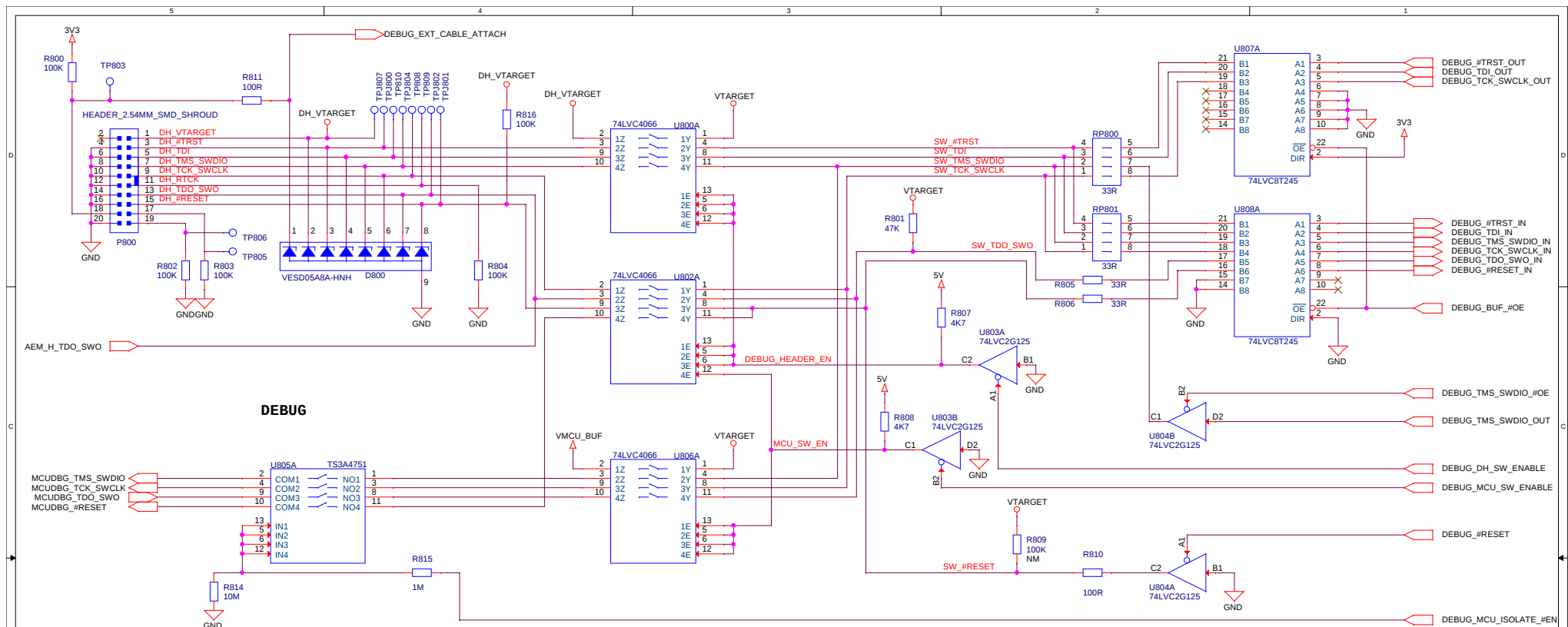
The USB VBUS voltage is used to bias these transistors, turning the P-Channel MOSFETs (Q700) off, and the N-Channel MOSFETs (Q701) on.

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



Starter Kit Common

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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	-	-

/Debug Interface
DBG

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The schematic diagram illustrates the MCU Voltage Sense circuit. It features a VMCU_BUF input connected to a 47K resistor (R727). The output of R727 is connected to a test point TP708. A 100K resistor (R729) is connected from the node after TP708 to GND. A 1N capacitor (C718) is also connected from this node to GND. The final output of the circuit is labeled AEM_SENSE_VOLTAGE.

MCU current sense

5V

L700 CBF102WB

R717 10R

C714 10uF

C710 100nF

C728 100nF

VCS

R709 1K8

VMCU_R

U703 LTC6102CDD

VREG V+

V- (HEAT)

VMCU_S

R710 1K8

R718 12K

C729 10nF

R1002 6K2

C1001 1nF

U1000A AD8656

R1004 51K

C1002 10pF

R1005 160R

R1003 62R

TP706

C920 100nF

AEM_Sense_CURRENT_RANGE2

R1007 6K2

C1003 1nF

U1000B AD8656

R1009 51K

C1004 10pF

R1010 51K

R1008 62R

TP707

C724 100nF

AEM_Sense_CURRENT_RANGE1

U1000C AD8656

V+

V-

R731 1R

C730 100nF

C731 10uF

L1001 CBF102WB

3V3

/Advanced Energy Monitor
AEM

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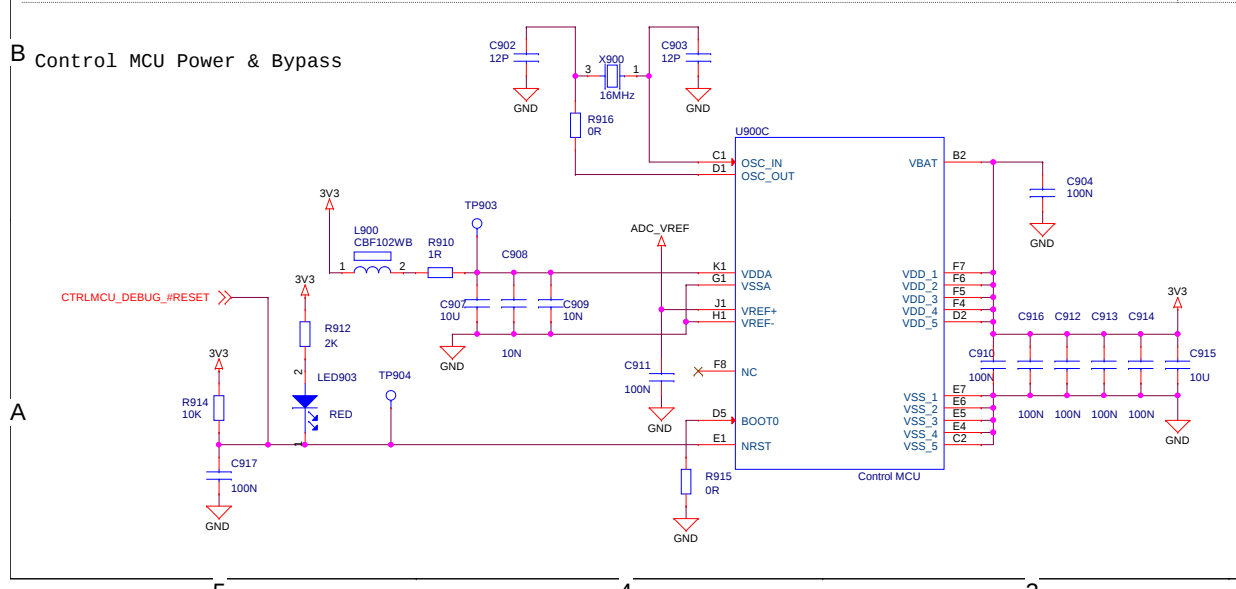
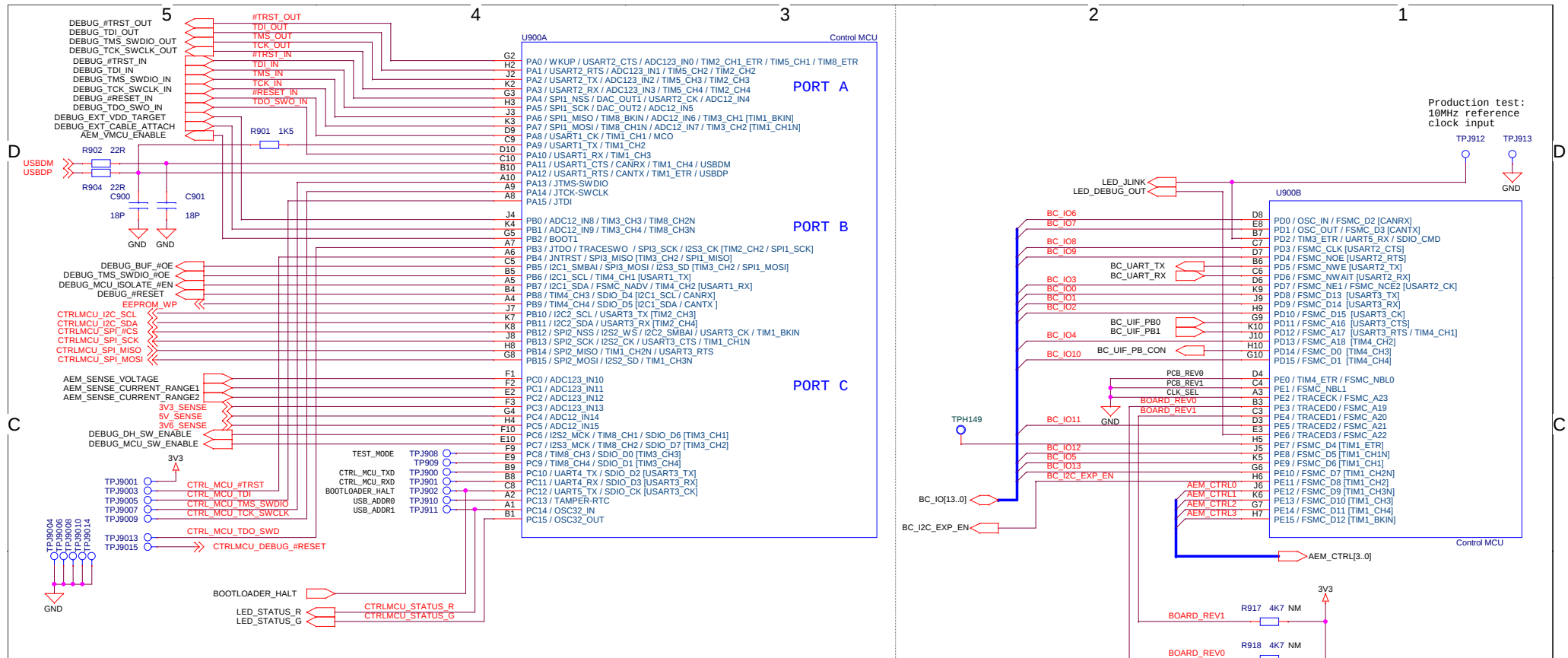
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