EFM32 Tiny Starter Kit

Revision History

Rev.	Description
A00	Initial Release
A01	Swapped LCD-com pins Added Resistor R790
A03	Changed R612, R611 to lower values
A04	Battery polarity protection Added frequency reference testpoint

PCB1

PCB2100

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Schematic Title: EFM32 Tiny Starter Kit		
Page Title: Title Page		
Designed: AG	Approved: JNO	
Size: A3	BOM Doc No: <Cage Code>	
Document number: BRD2100A		Revision: A04
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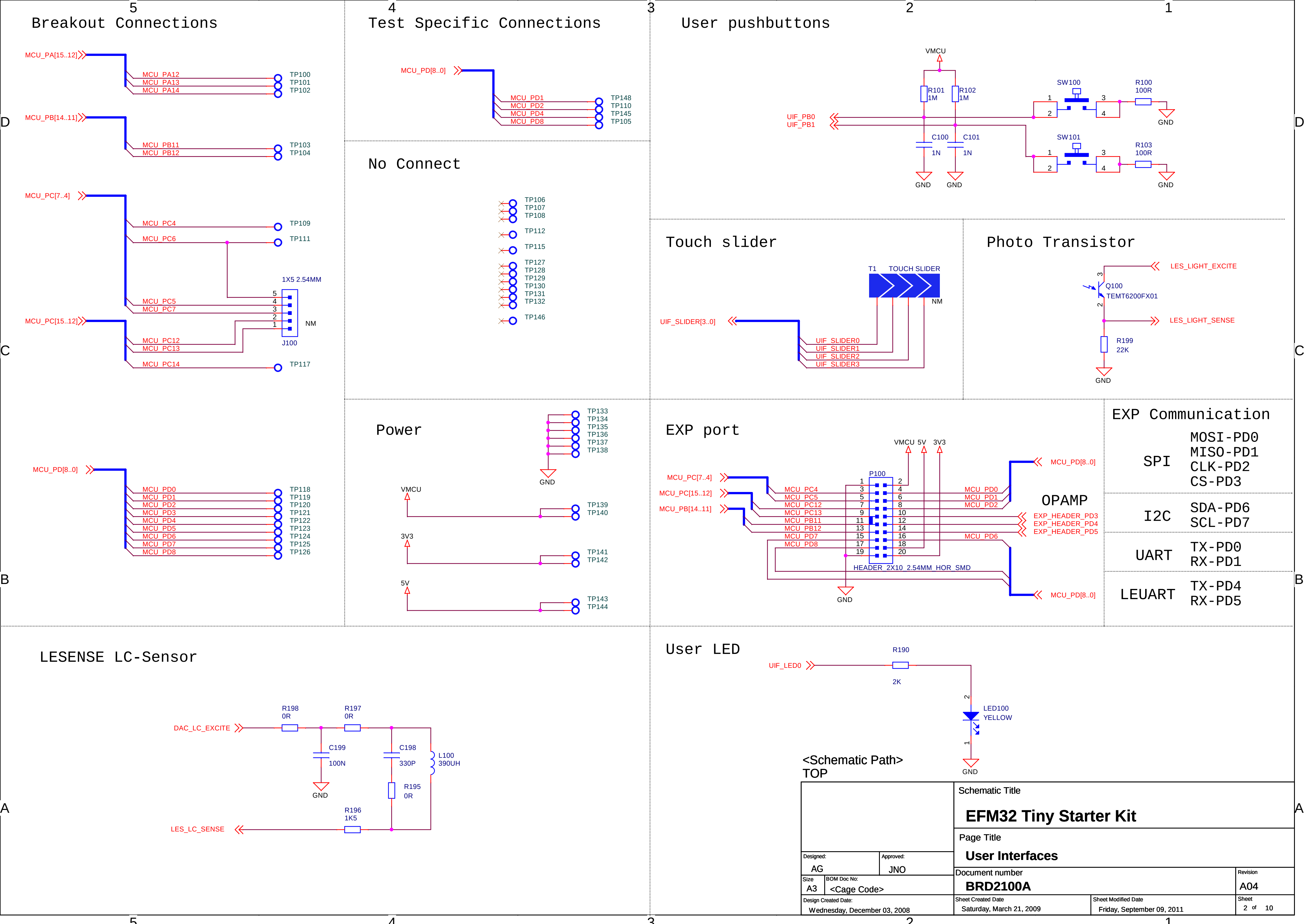

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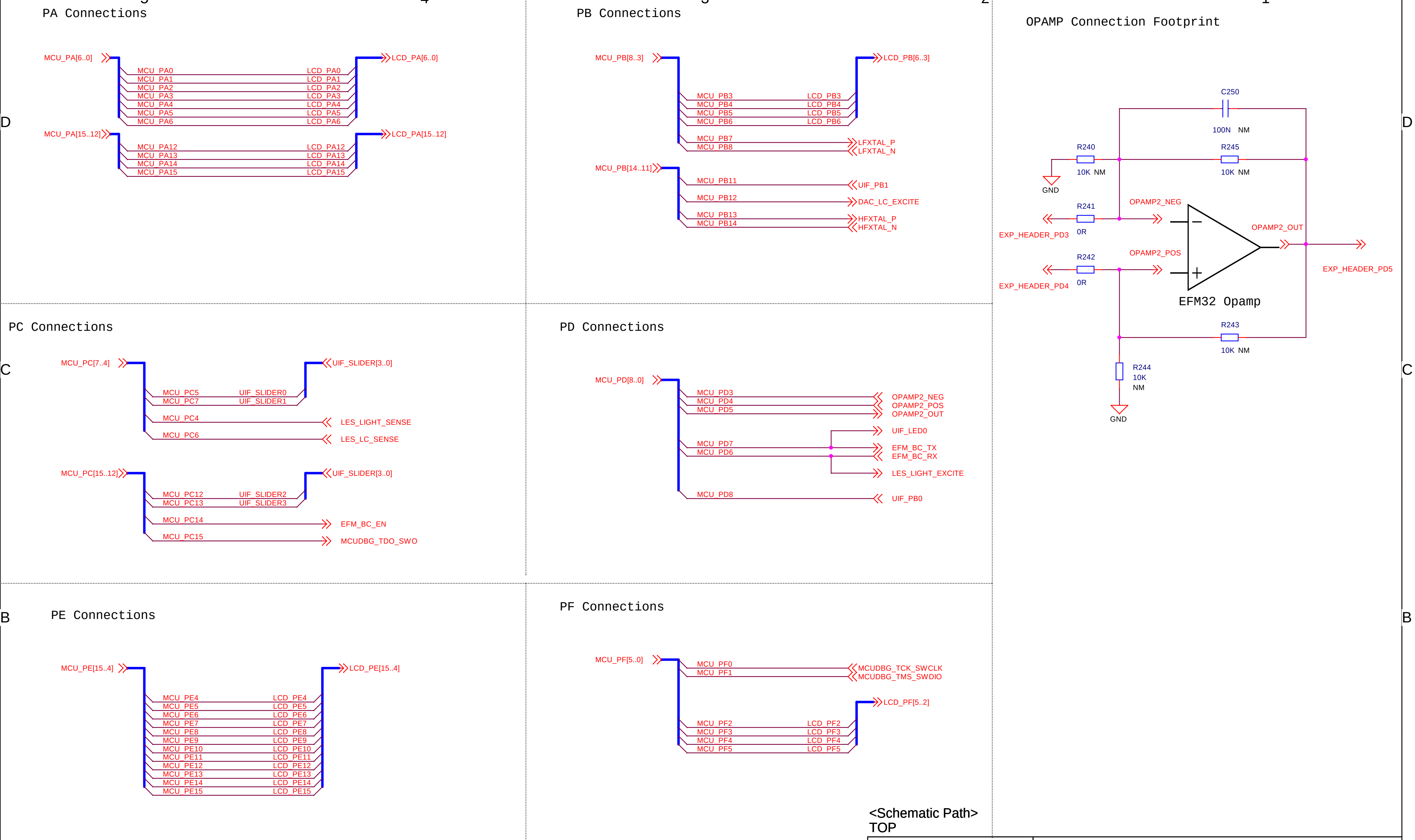

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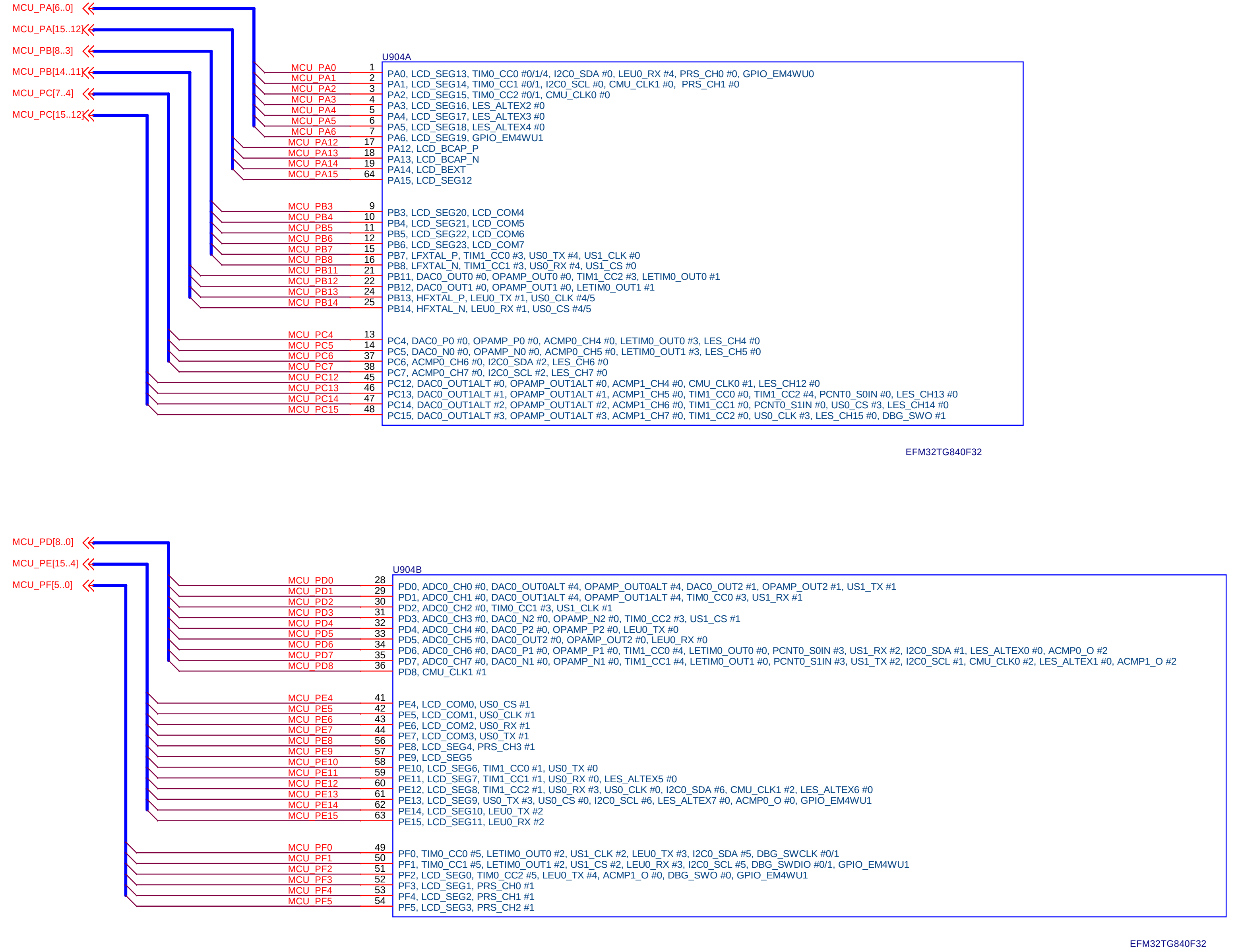

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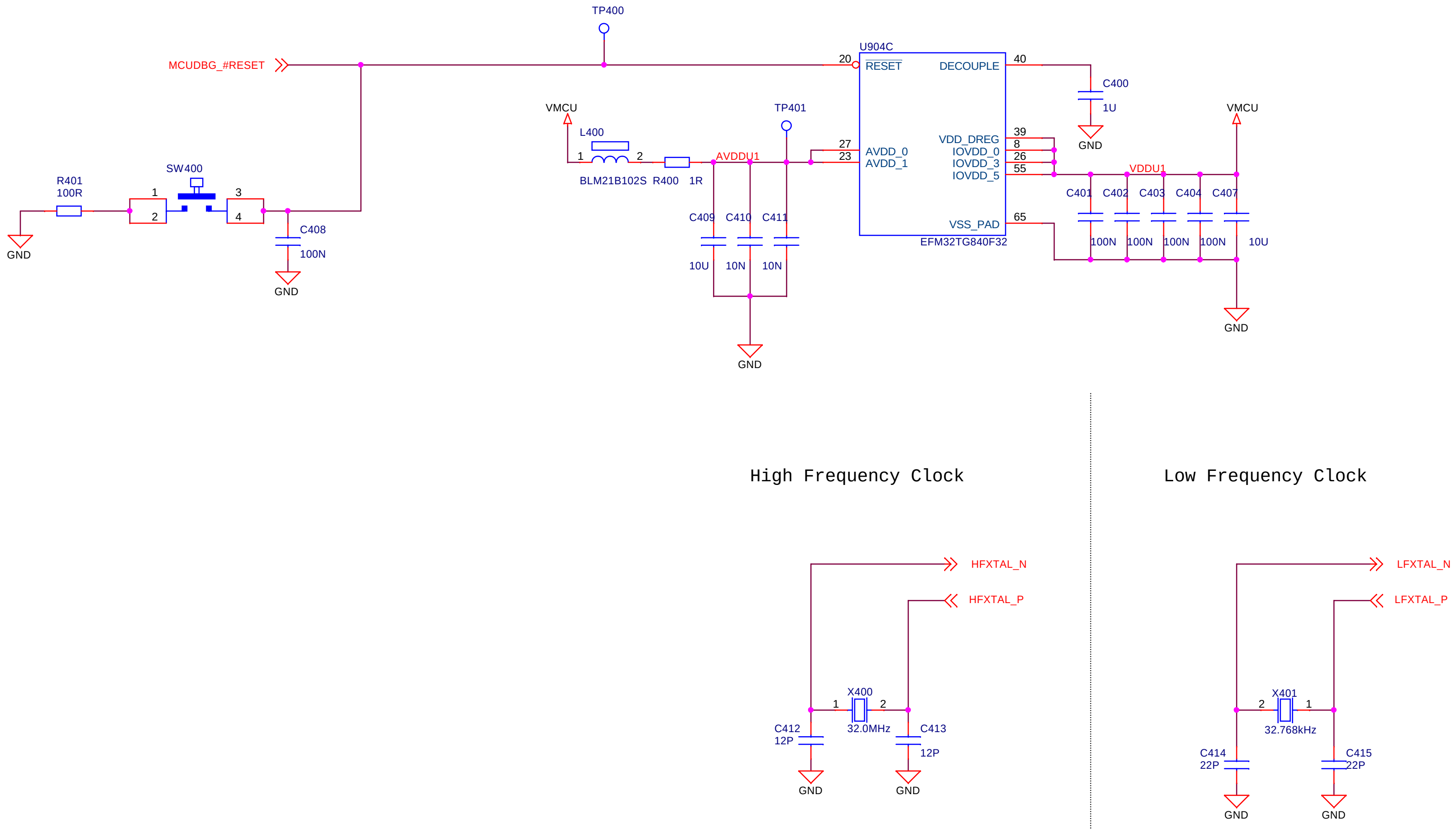

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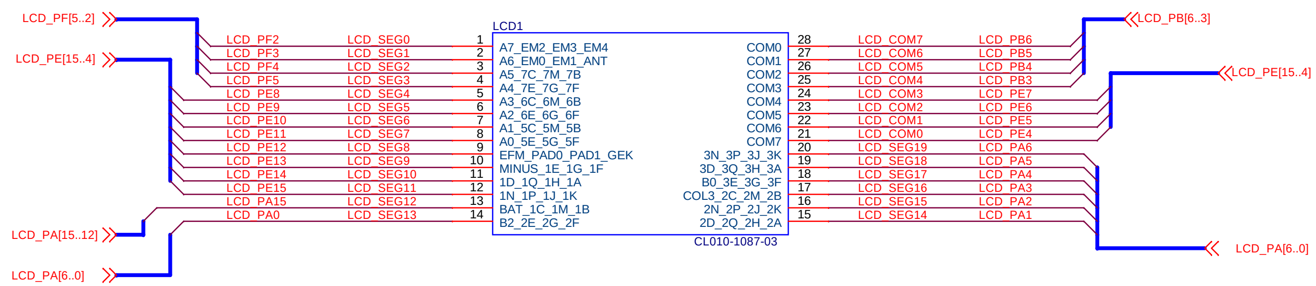
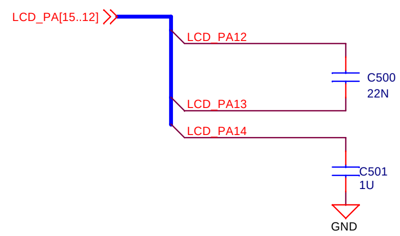
LCD signal connections



LCD Boost

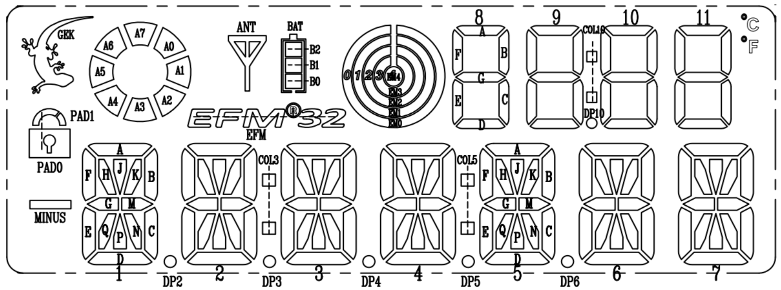


Segment names

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							

Segment placement



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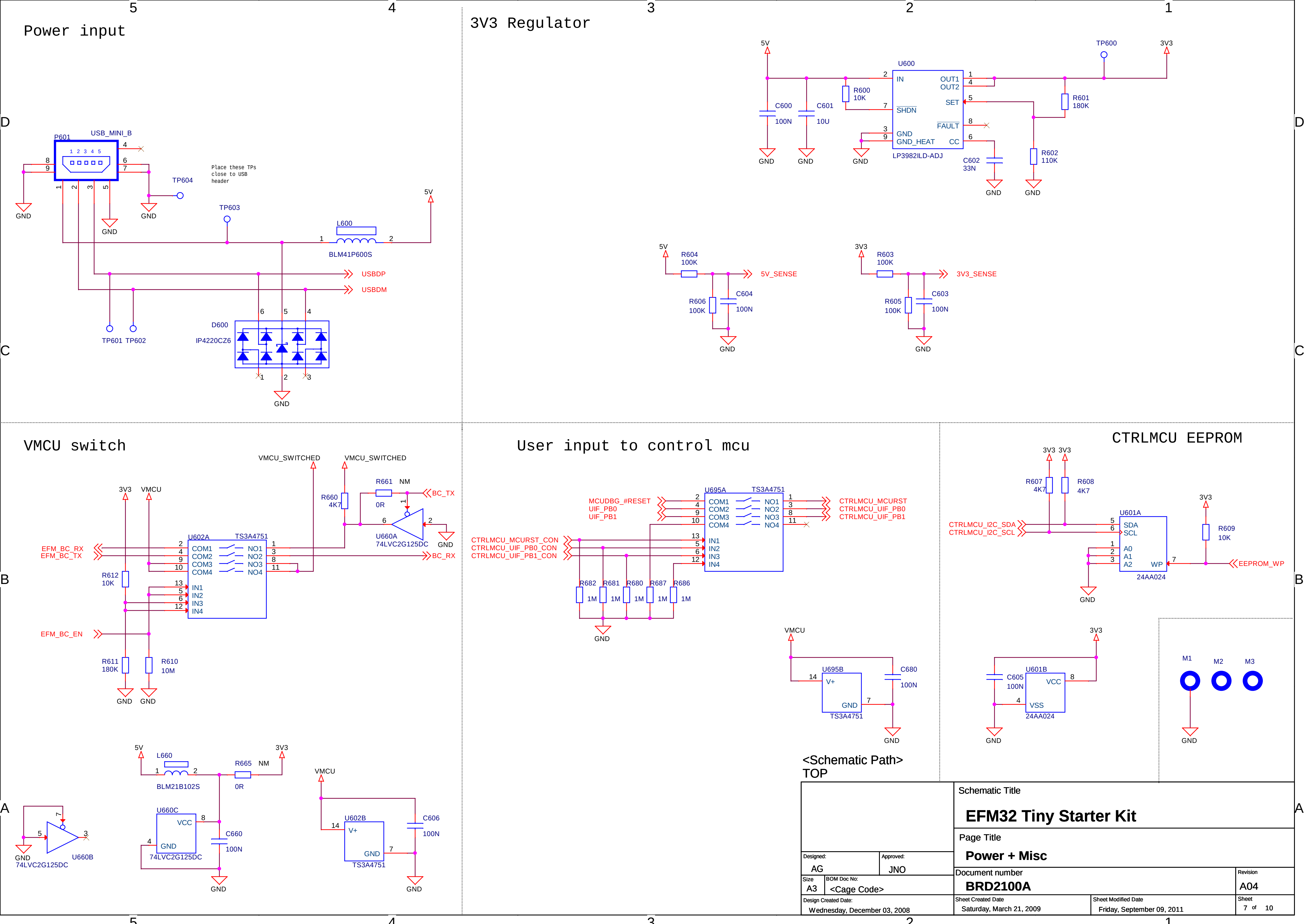

Power input
P601 USB_MINI_B
TP604
TP603
Place these TPs close to USB header
L600 BLM41P600S
5V
USBDP
USBDM
D600 IP4220CZ6
TP601 TP602
GND
3V3 Regulator
U600 LP3982ILD-ADJ
IN
SHDN
GND
GND_HEAT
OUT1
OUT2
SET
FAULT
CC
C600 100N
C601 10U
R600 10K
R601 180K
R602 110K
C602 33N
TP600
3V3
R604 100K
R606 100K
C604 100N
5V_SENSE
R603 100K
R605 100K
C603 100N
3V3_SENSE
VMCU switch
VMCU_SWITCHED
R661 NM 0R
R660 4K7
BC_TX
BC_RX
U660A 74LVC2G125DC
U602A TS3A4751
COM1 COM2 COM3 COM4
NO1 NO2 NO3 NO4
IN1 IN2 IN3 IN4
EFM_BC_RX
EFM_BC_TX
EFM_BC_EN
R612 10K
R611 180K
R610 10M
VMCU
U660B 74LVC2G125DC
L660 BLM21B102S
R665 NM 0R
U660C 74LVC2G125DC
VCC
C660 100N
U602B TS3A4751
V+
C606 100N
User input to control mcu
U695A TS3A4751
MCUDBG_#RESET
UIF_PB0
UIF_PB1
CTRLMCU_MCURST
CTRLMCU_UIF_PB0
CTRLMCU_UIF_PB1
CTRLMCU_MCURST_CON
CTRLMCU_UIF_PB0_CON
CTRLMCU_UIF_PB1_CON
R682 R681 R680 R687 R686 1M
U695B TS3A4751
C680 100N
CTRLMCU EEPROM
R607 4K7
R608 4K7
U601A 24AA024
SDA SCL A0 A1 A2 WP
CTRLMCU_I2C_SDA
CTRLMCU_I2C_SCL
R609 10K
EEPROM_WP
U601B 24AA024
VSS
C605 100N
M1 M2 M3
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EFM32 Tiny Starter Kit
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Power + Misc
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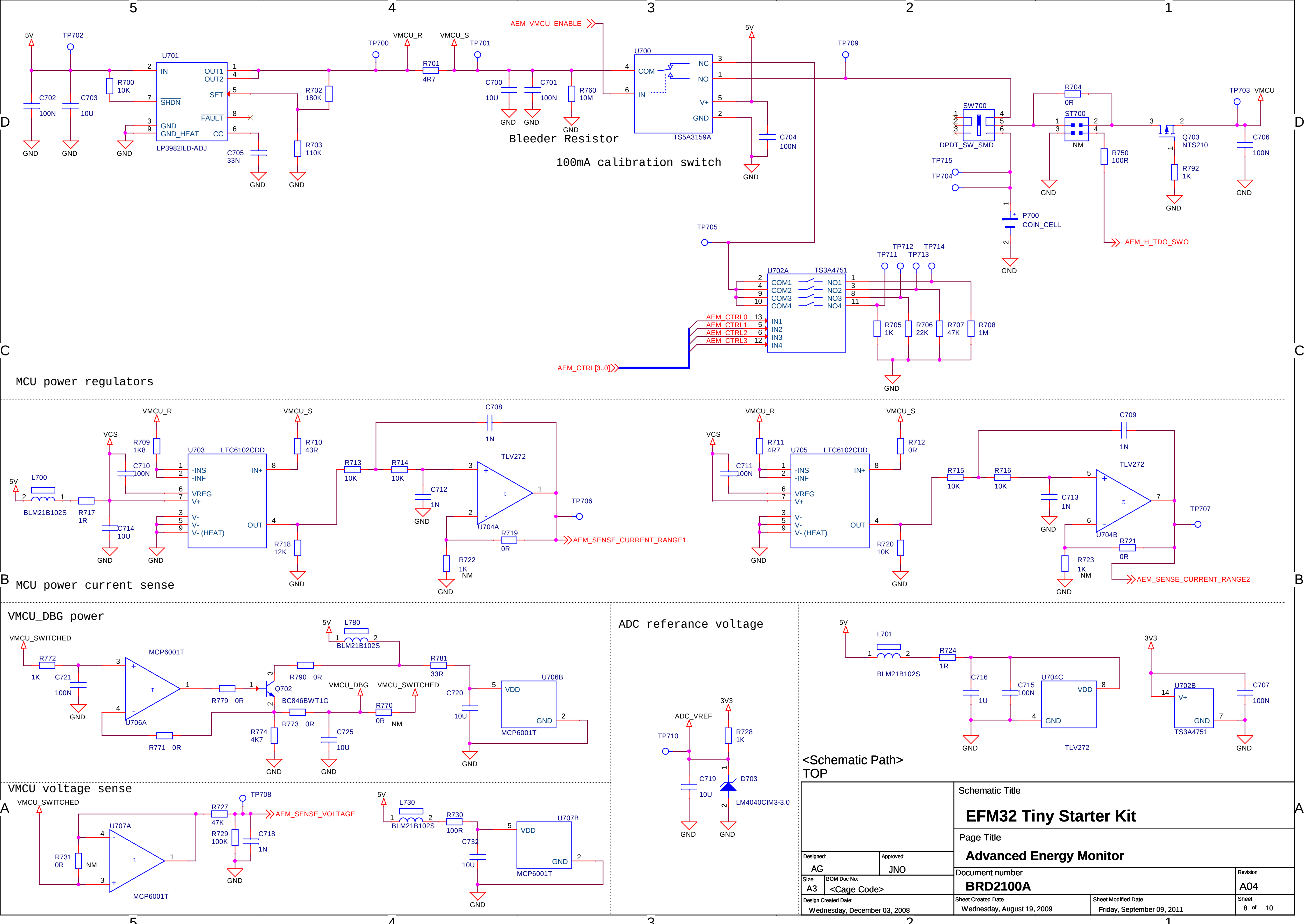

Bleeder Resistor
100mA calibration switch
MCU power regulators
MCU power current sense
VMCU_DBG power
ADC referance voltage
VMCU voltage sense
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EFM32 Tiny Starter Kit
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Advanced Energy Monitor
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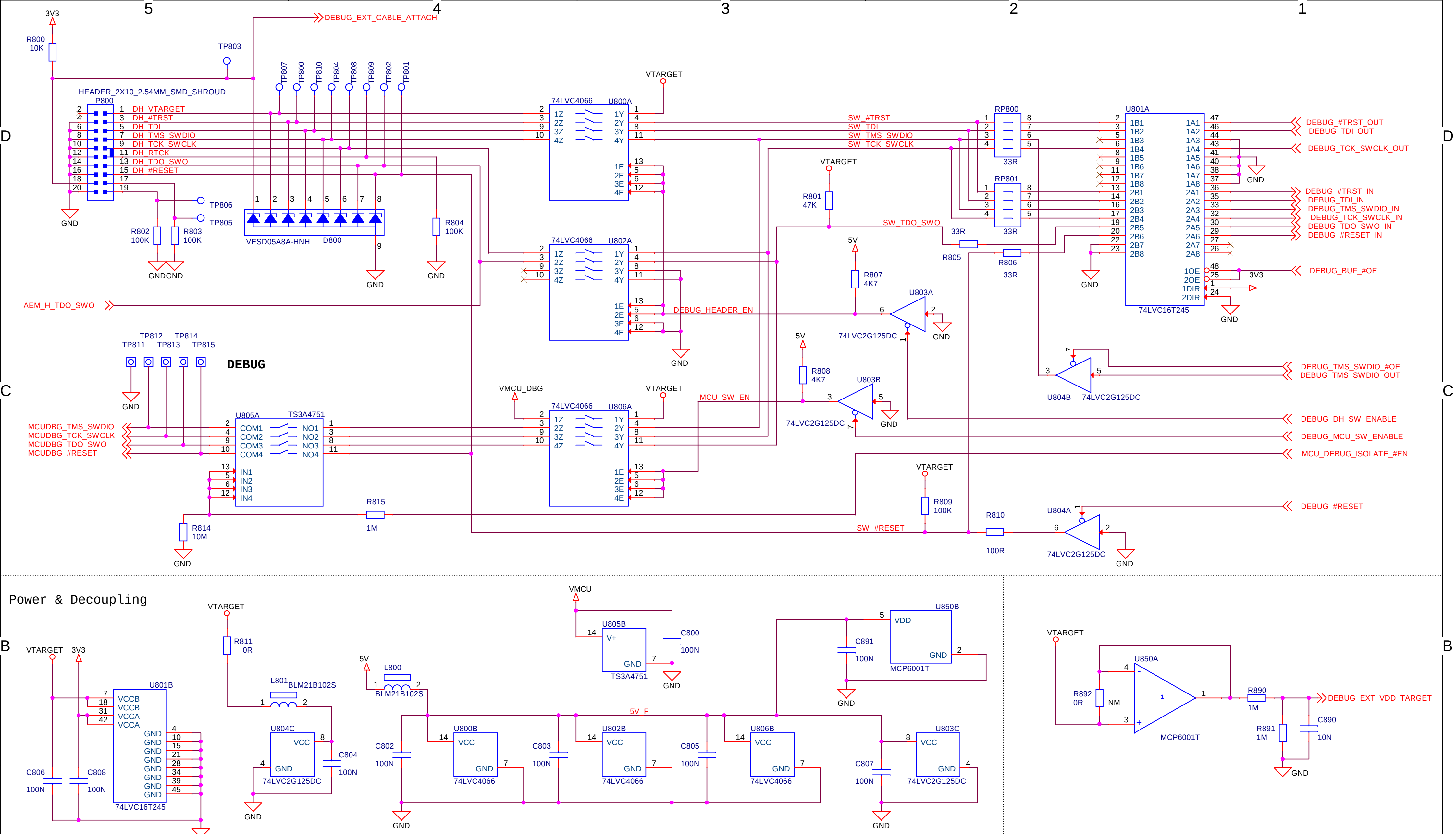

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Mode	DEBUG_MCU_SW_ENABLE	DEBUG_DH_SW_ENABLE	DEBUG_BUF_#OE	DH_VTARGET	VTARGET
Debug Out	0	1	0	External voltage	External voltage
MCU Debug	1	0	0	Disconnected	VMCU
Debug In	1	1	1	VMCU	VMCU

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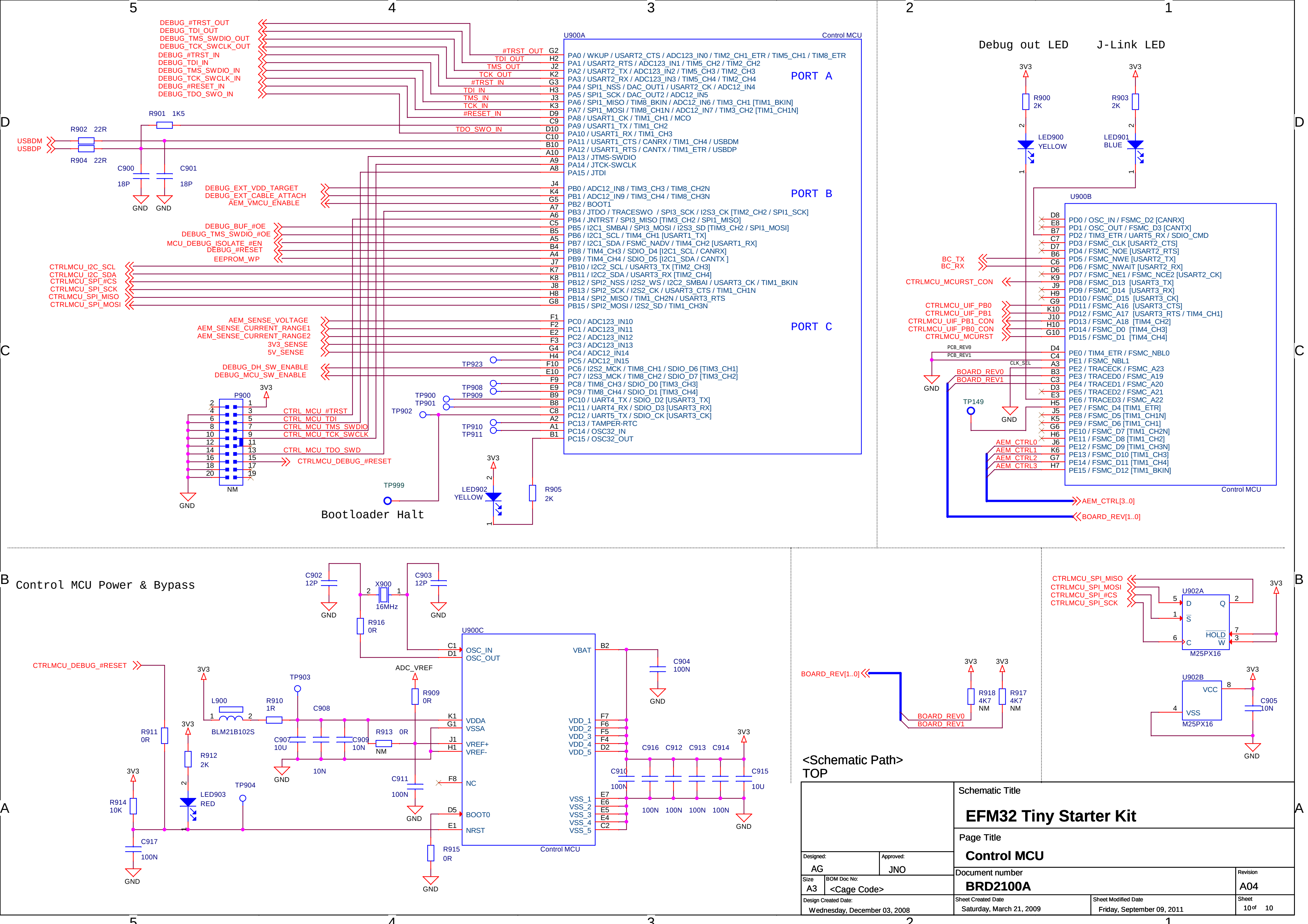

Control MCU
U900A
PORT A
PA0 / WKUP / USART2_CTS / ADC123_IN0 / TIM2_CH1_ETR / TIM5_CH1 / TIM8_ETR
PA1 / USART2_RTS / ADC123_IN1 / TIM5_CH2 / TIM2_CH2
PA2 / USART2_TX / ADC123_IN2 / TIM5_CH3 / TIM2_CH3
PA3 / USART2_RX / ADC123_IN3 / TIM5_CH4 / TIM2_CH4
PA4 / SPI1_NSS / USART2_CK / DAC_OUT1 / ADC12_IN4
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
PORT B
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
PORT C
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
DEBUG_#TRST_OUT
DEBUG_TDI_OUT
DEBUG_TMS_SWDIO_OUT
DEBUG_TCK_SWCLK_OUT
DEBUG_#TRST_IN
DEBUG_TDI_IN
DEBUG_TMS_SWDIO_IN
DEBUG_TCK_SWCLK_IN
DEBUG_#RESET_IN
DEBUG_TDO_SWO_IN
#TRST_OUT
TDI_OUT
TMS_OUT
TCK_OUT
#TRST_IN
TDI_IN
TMS_IN
TCK_IN
#RESET_IN
TDO_SWO_IN
USBDM
USBDP
R901 1K5
R902 22R
R904 22R
C900 18P
C901 18P
GND
DEBUG_EXT_VDD_TARGET
DEBUG_EXT_CABLE_ATTACH
AEM_VMCU_ENABLE
DEBUG_BUF_#OE
DEBUG_TMS_SWDIO_#OE
MCU_DEBUG_ISOLATE_#EN
DEBUG_#RESET
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
DEBUG_DH_SW_ENABLE
DEBUG_MCU_SW_ENABLE
TP923
TP908
TP909
TP900
TP901
TP902
TP910
TP911
P900
NM
3V3
CTRL_MCU_#TRST
CTRL_MCU_TDI
CTRL_MCU_TMS_SWDIO
CTRL_MCU_TCK_SWCLK
CTRL_MCU_TDO_SWD
CTRLMCU_DEBUG_#RESET
TP999
LED902 YELLOW
R905 2K
Bootloader Halt
Debug out LED
J-Link LED
R900 2K
R903 2K
LED900 YELLOW
LED901 BLUE
U900B
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]
BC_TX
BC_RX
CTRLMCU_MCURST_CON
CTRLMCU_UIF_PB0
CTRLMCU_UIF_PB1
CTRLMCU_UIF_PB1_CON
CTRLMCU_UIF_PB0_CON
CTRLMCU_MCURST
PCB_REV0
PCB_REV1
CLK_SEL
BOARD_REV0
BOARD_REV1
TP149
AEM_CTRL0
AEM_CTRL1
AEM_CTRL2
AEM_CTRL3
AEM_CTRL[3..0]
BOARD_REV[1..0]
Control MCU Power & Bypass
C902 12P
C903 12P
X900 16MHz
R916 0R
U900C
OSC_IN
OSC_OUT
VBAT
C904 100N
CTRLMCU_DEBUG_#RESET
ADC_VREF
TP903
R909 0R
L900 BLM21B102S
R910 1R
C908
C907 10U
C909 10N
10N
R913 0R NM
R911 0R
R912 2K
LED903 RED
R914 10K
TP904
C917 100N
C911 100N
VDDA
VSSA
VREF+
VREF-
NC
BOOT0
NRST
R915 0R
VDD_1
VDD_2
VDD_3
VDD_4
VDD_5
VSS_1
VSS_2
VSS_3
VSS_4
VSS_5
C916 C912 C913 C914
C910 100N
C915 10U
100N 100N 100N 100N
BOARD_REV[1..0]
R918 4K7 NM
R917 4K7 NM
BOARD_REV0
BOARD_REV1
U902A
M25PX16
D
Q
S
C
HOLD
W
U902B
VCC
VSS
C905 10N
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EFM32 Tiny Starter Kit
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Control MCU
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