EFM32 Zero Gecko STK

Board Function	Page
Title Page	1
User Interface	2
EFM32 Signal Assignments	3
EFM32 I/O	4
EFM32 Power	5
STK Common Interface	6
STK Common/Power & Misc	7
STK Common/AEM	8
STK Common/Debug Interface	9
STK Common/Board Controller	10
Board Controller/Misc	11
Board Controller/Control MCU	12

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.

PCB1

PCB2010

STK

Designed: ANB | Approved: JNO

Size: A3 | BOM Doc No:

Design Created Date: Wednesday, December 03, 2008

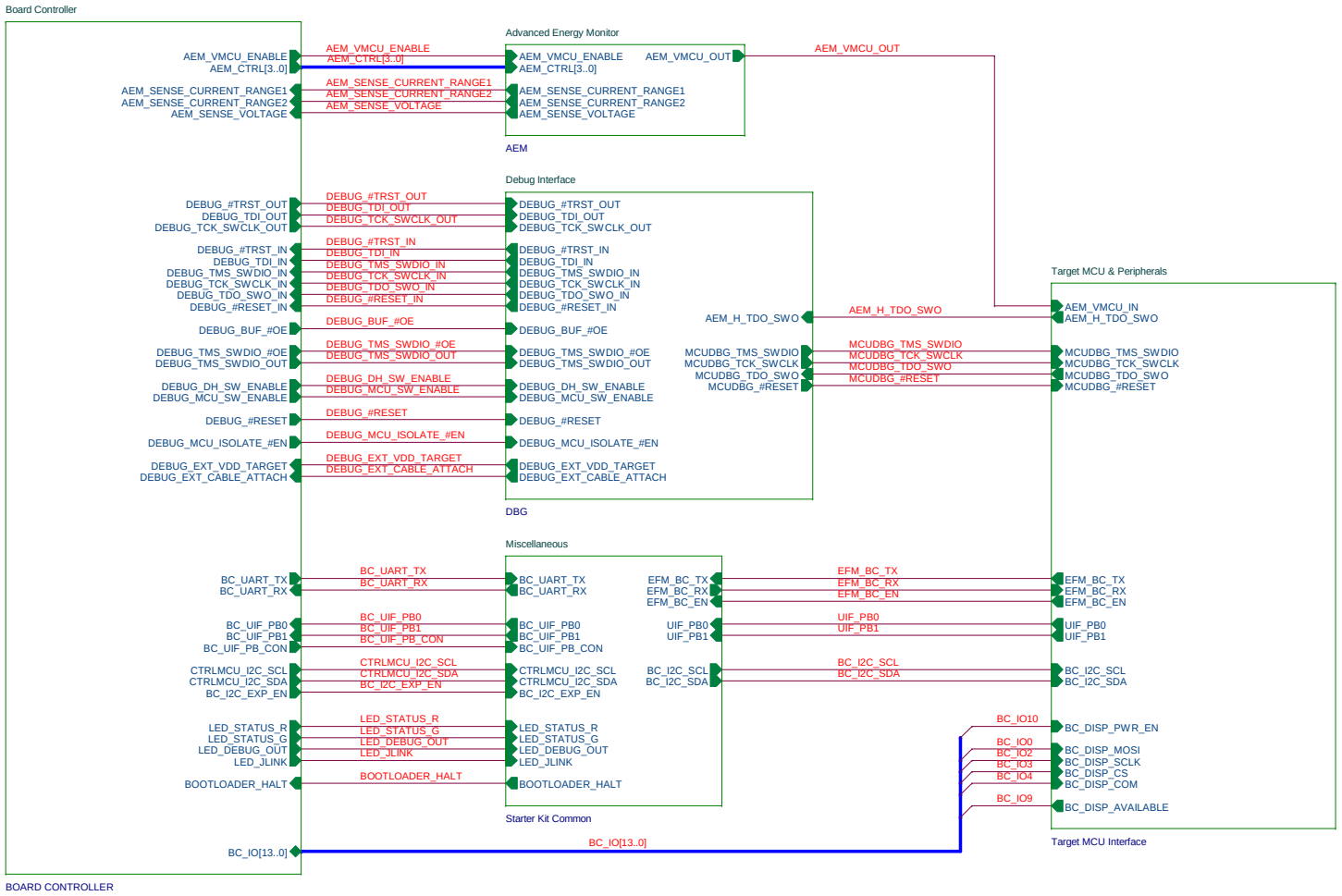
Schematic Title: **EFM32 Zero Gecko Starter Kit**

Page Title: **Title Page**

Document number: **BRD2010A** | Revision: **B01**

Sheet Created Date: Saturday, March 21, 2009 | Sheet Modified Date: Friday, March 13, 2015

Sheet 1 of 10

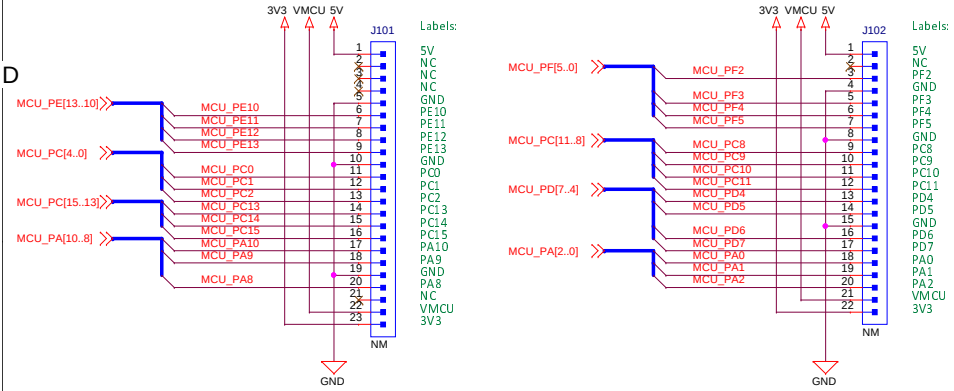


/
STK

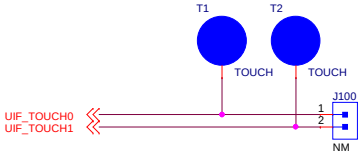
SILICON LABS

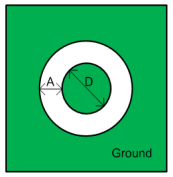
Schematic Title	EFM32 Zero Gecko Starter Kit
Page Title	Functional Blocks
Designed: DDB	Approved: JNO
Document number	BRD2010A
Revision	B01
Size A3	BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008	
Sheet Created Date: Wednesday, June 19, 2013	Sheet Modified Date: Friday, March 13, 2015
Sheet	2 of 10

Breakout Connections



Touch Pads





D = 7-10 mm, bigger is better
A = 2.5 mm
Only top layer shown. No ground on other layers below button or anular ring.

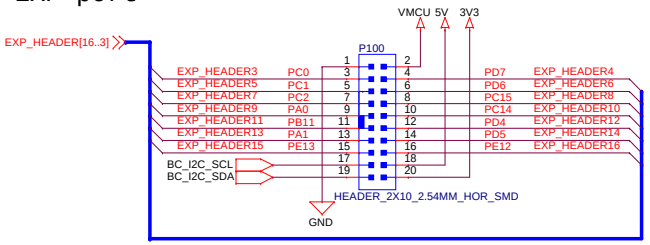
Trace should be taken to bottom layer with via at edge of button, keep tracec short, away from power/noisy traces and route directly to efm32.

Full Ground

No Ground

For mulitple buttons, keep centers at least 20mm apart, enough to allow ground between buttons.

EXP port

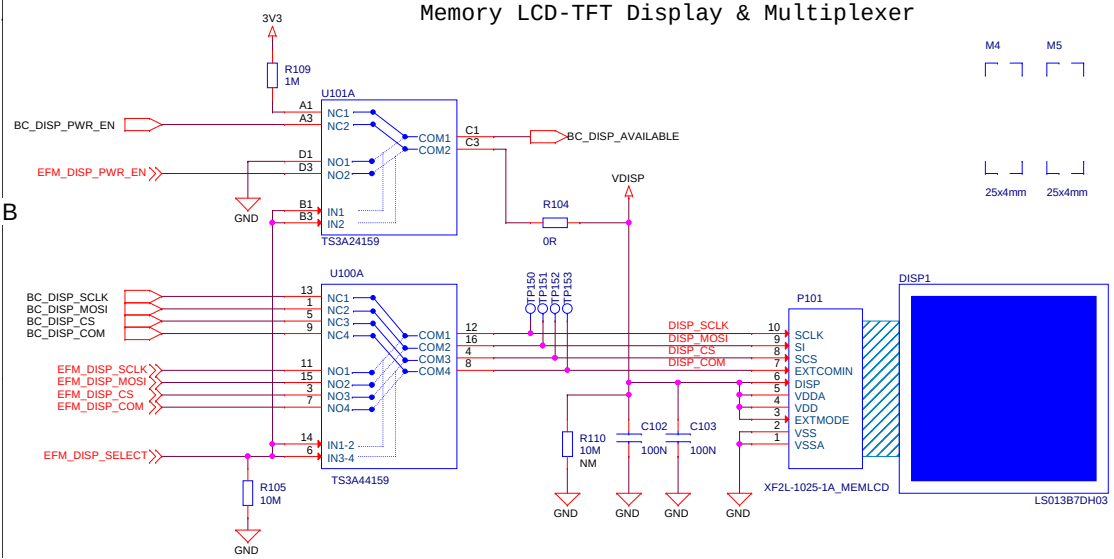


EXP-Header Functionality

1	GND		
3	PC0		ACMP0_CH0
5	PC1		ACMP0_CH1
7	PC2		ACMP0_CH2
9	PA0		
11	PB11		IDAC0_OUT
13	PA1		
15	PE13	I2C0_SCL	
17	Reserved for EXP Board Identification		
19	Reserved for EXP Board Identification		

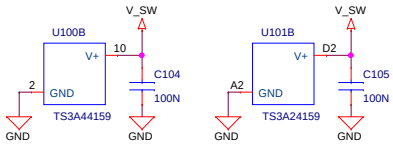
2	VMCU		
4	PD7	US1_TX	ADC0_CH7
6	PD6	US1_RX	ADC0_CH6
8	PC15	US1_CLK	
10	PC14	US1_CS	
12	PD4	LEU0_TX	ADC0_CH4
14	PD5	LEU0_RX	ADC0_CH5
16	PE12	I2C0_SDA	
18	5V		
20	3V3		

Memory LCD-TFT Display & Multiplexer

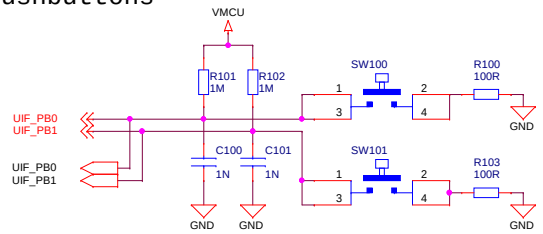


EFM_DISP_SELECT	DISP_CTRL	VDISP	BC_DISP_AVAILABLE
1	EFM	EFM_DISP_PWR_EN	0
0	BC	BC_DISP_PWR_EN	1

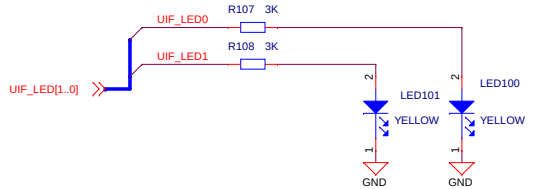
The EFM32 always controls ownership of the display using the EFM_DISP_SELECT signal.



User pushbuttons



User LEDs



Target MCU Interface

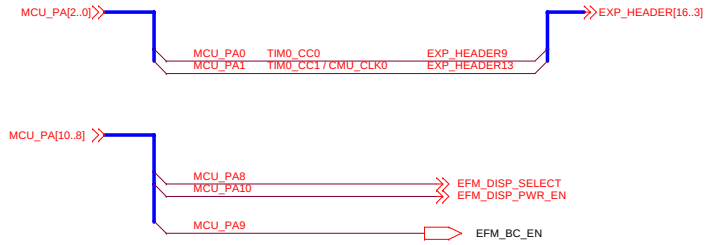
SILICON LABS

Schematic Title: **EFM32 Zero Gecko Starter Kit**

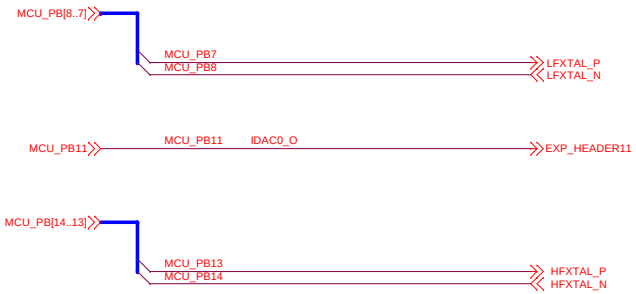
Page Title: **User Interfaces**

Designed: ANB	Approved: JNO		
Size: A3	BOM Doc No:	Document number: BRD2010A	Revision: B01
Design Created Date: Wednesday, December 03, 2008		Sheet Created Date: Wednesday, August 28, 2013	Sheet Modified Date: Friday, March 13, 2015
			Sheet: 3 of 10

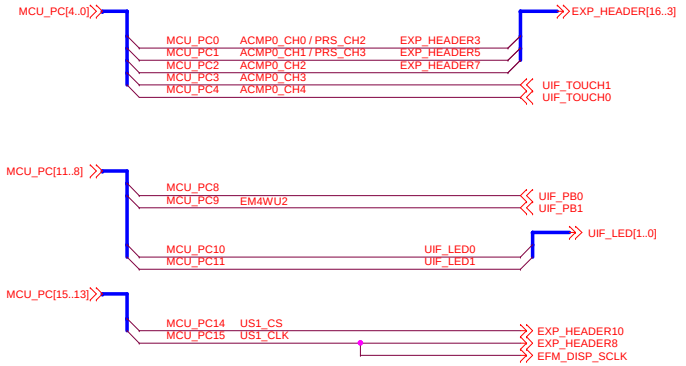
PA Connections



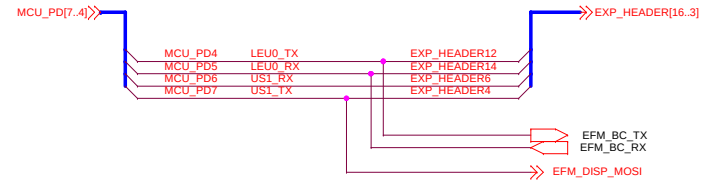
PB Connections



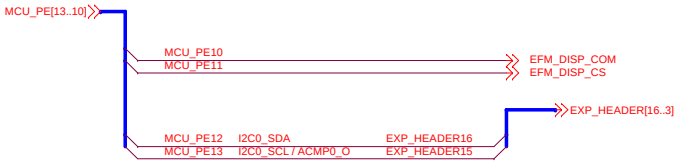
PC Connections



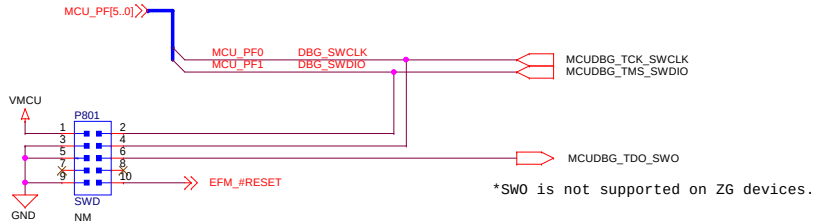
PD Connections



PE Connections



PF Connections



*SWO is not supported on ZG devices.

Target MCU Interface

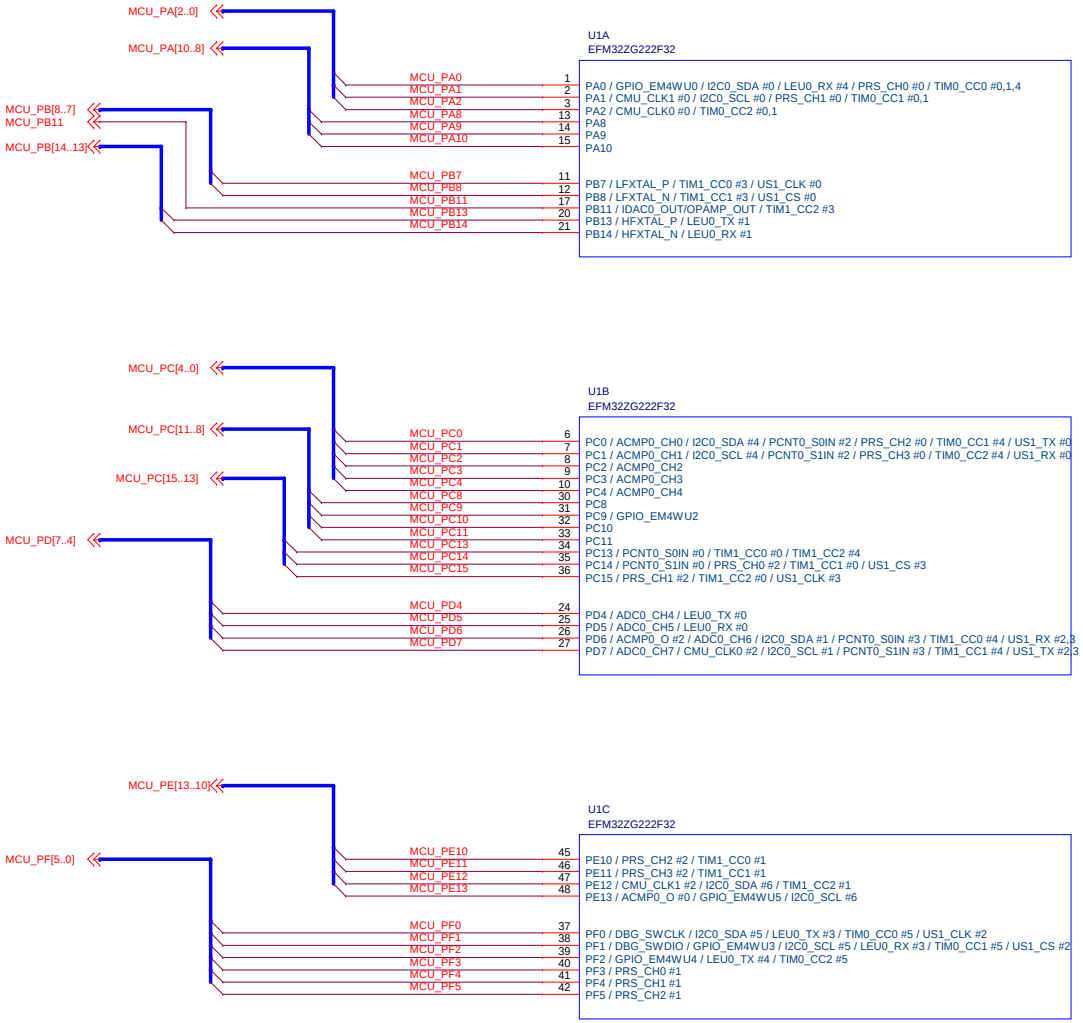
SILICON LABS

Designed: ANB	Approved: JNO
Size: A3	BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM32 Zero Gecko Starter Kit**

Page Title: **Signal Assignments**

Document number: **BRD2010A**		Revision: B01
Sheet Created Date: Wednesday, August 28, 2013	Sheet Modified Date: Friday, March 13, 2015	Sheet: 4 of 10



SILICON LABS

Designed: ANB	Approved: JNO
Size: A3	BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008	

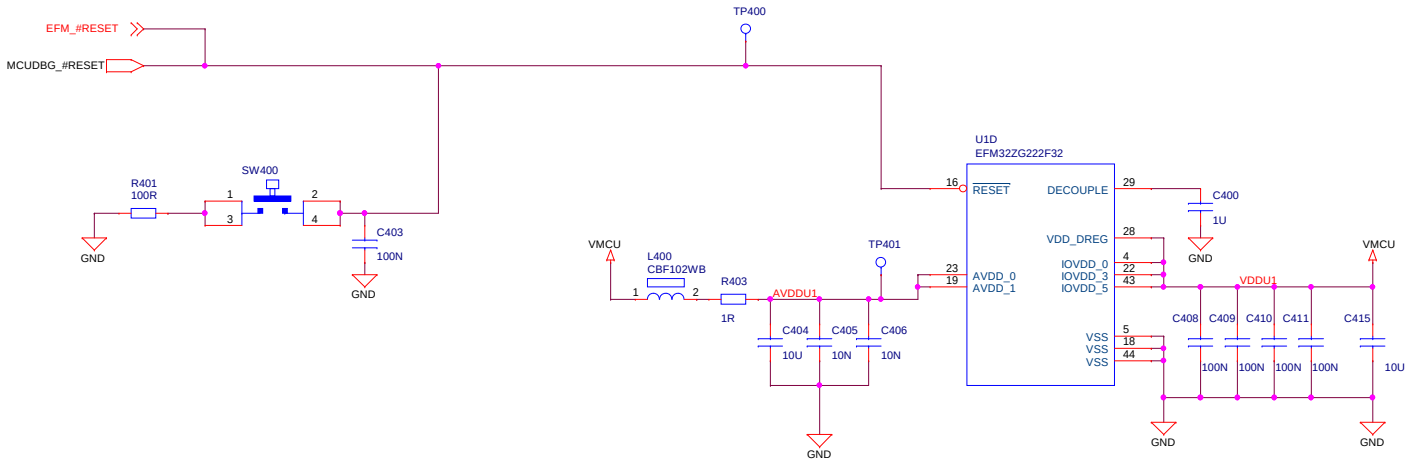
Schematic Title

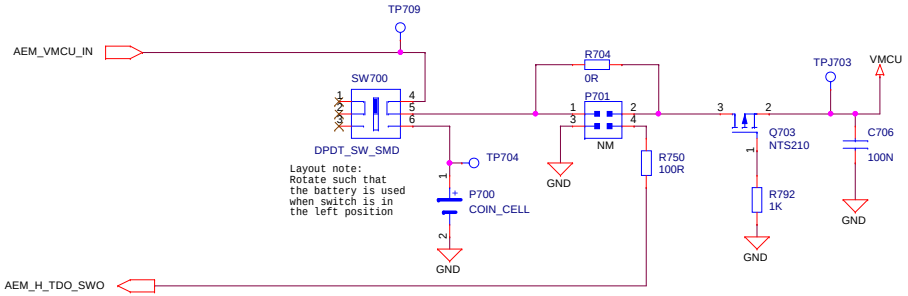
EFM32 Zero Gecko Starter Kit

Page Title

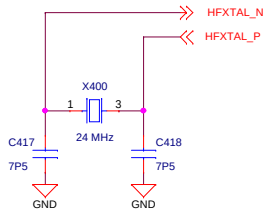
EFM32 I/O

Document number: **BRD2010A**		Revision: B01
Sheet Created Date: Wednesday, August 28, 2013	Sheet Modified Date: Friday, March 13, 2015	Sheet: 5 of 10

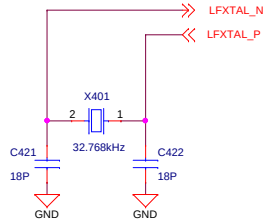




High Frequency Clock



Low Frequency Clock



Target MCU Interface

SILICON LABS

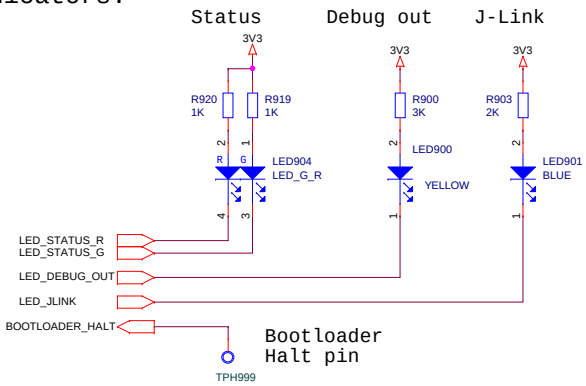
Designed: ANB	Approved: JNO
Size: A3	BOM Doc No: <Cage Code>
Design Created Date: Wednesday, December 03, 2008	

Schematic Title: **EFM32 Zero Gecko Starter Kit**

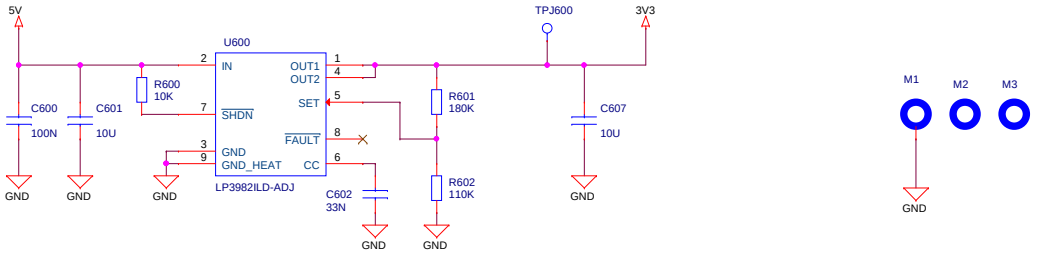
Page Title: **EFM32 Power & USB**

Document number: **BRD2010A**		Revision: B01
Sheet Created Date: Wednesday, August 28, 2013	Sheet Modified Date: Friday, March 13, 2015	Sheet: 6 of 10

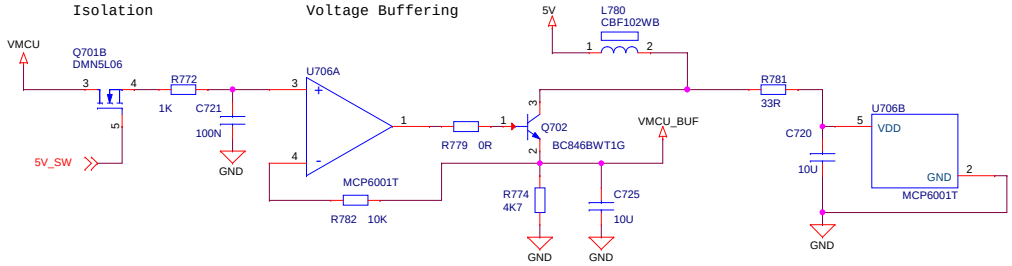
Indicators:



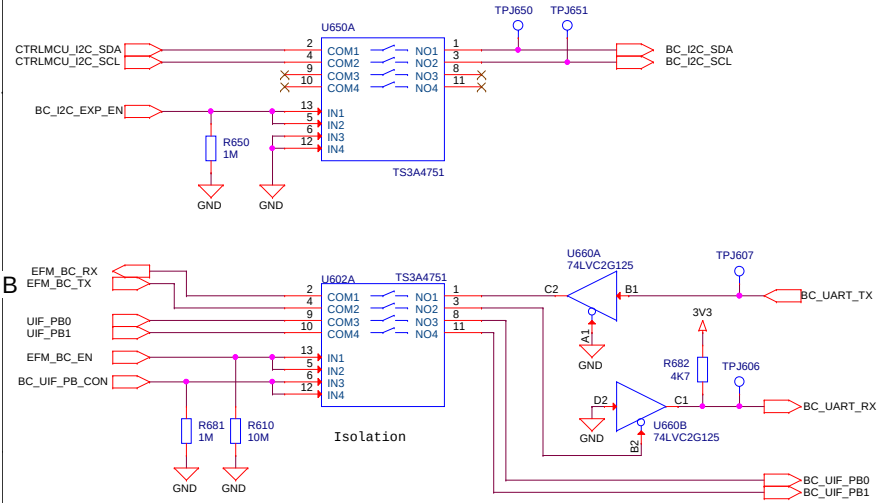
3V3 Regulator

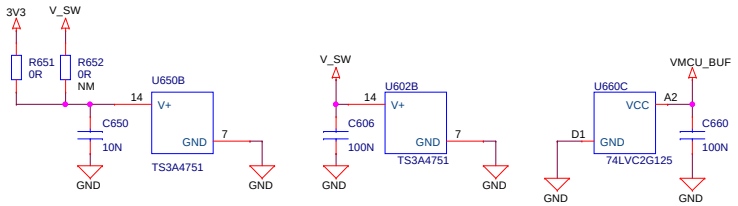


VMCU Voltage Mirror



Voltage Domain Isolation & Level Shift

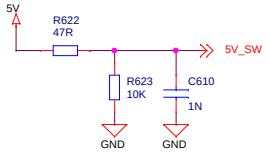


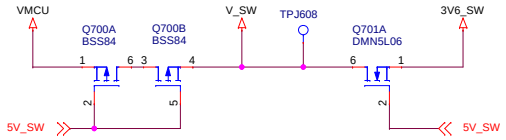


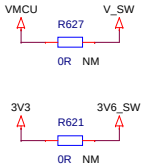
Power Supply for Analog Switches

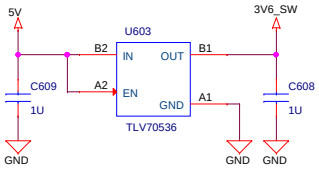
The USB VBUS voltage is used to bias these transistors, turning the P-Channel MOSFETs (Q700) off, and the N-Channel MOSFETs (Q701) on.

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





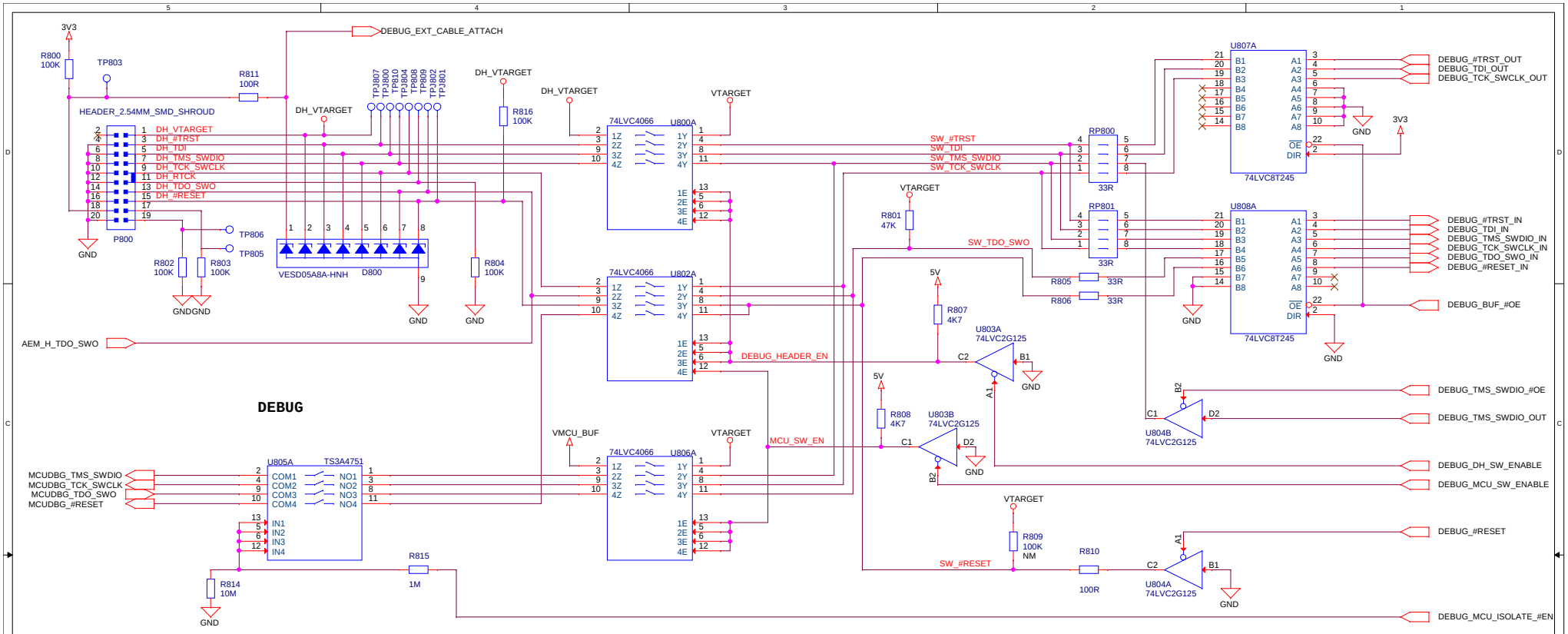


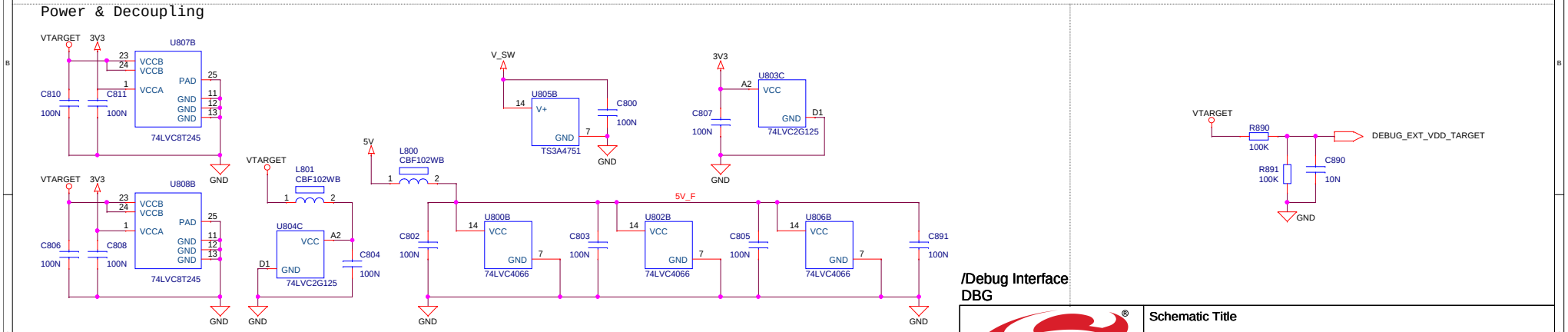


Starter Kit Common

SILICON LABS

Schematic Title	EFM32 Zero Gecko Starter Kit
Page Title	Power & Misc
Designed: DDB	Approved: JNO
Size A3	BOM Doc No: <Cage Code>
Document number	BRD2010A
Revision	B01
Design Created Date:	Wednesday, June 12, 2013
Sheet Created Date	Tuesday, June 18, 2013
Sheet Modified Date	Friday, March 13, 2015
Sheet	7 of 10





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

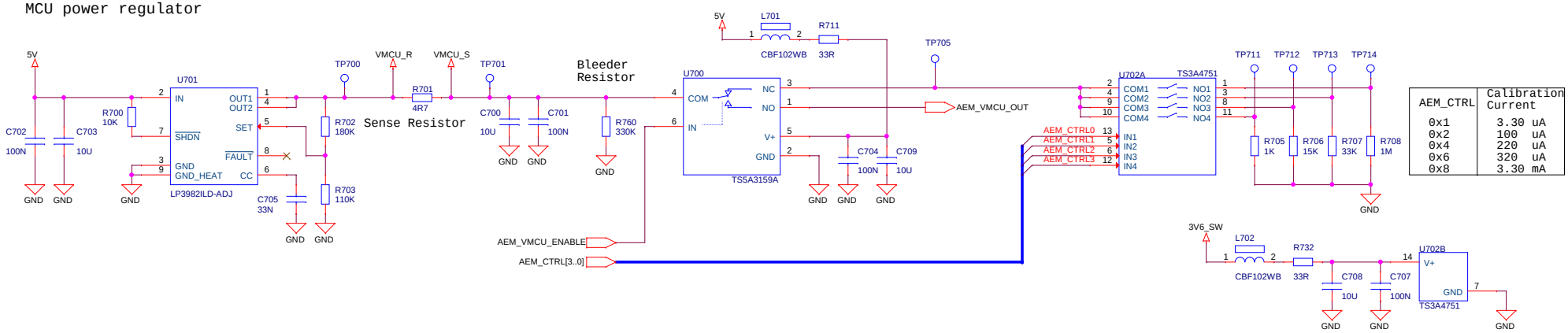
SILICON LABS

Schematic Title
EFM32 Zero Gecko Starter Kit

Page Title
Debug Interface

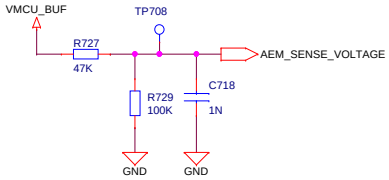
Designed: <OrgAddr1>	Approved: <OrgAddr2>		
Size A3	BOM Doc No: <Cage Code>	Document number BRD2010A	Revision B01
Design Created Date: Monday, August 12, 2013	Sheet Created Date Monday, August 12, 2013	Sheet Modified Date Friday, March 13, 2015	Sheet 8 of 10

MCU power regulator

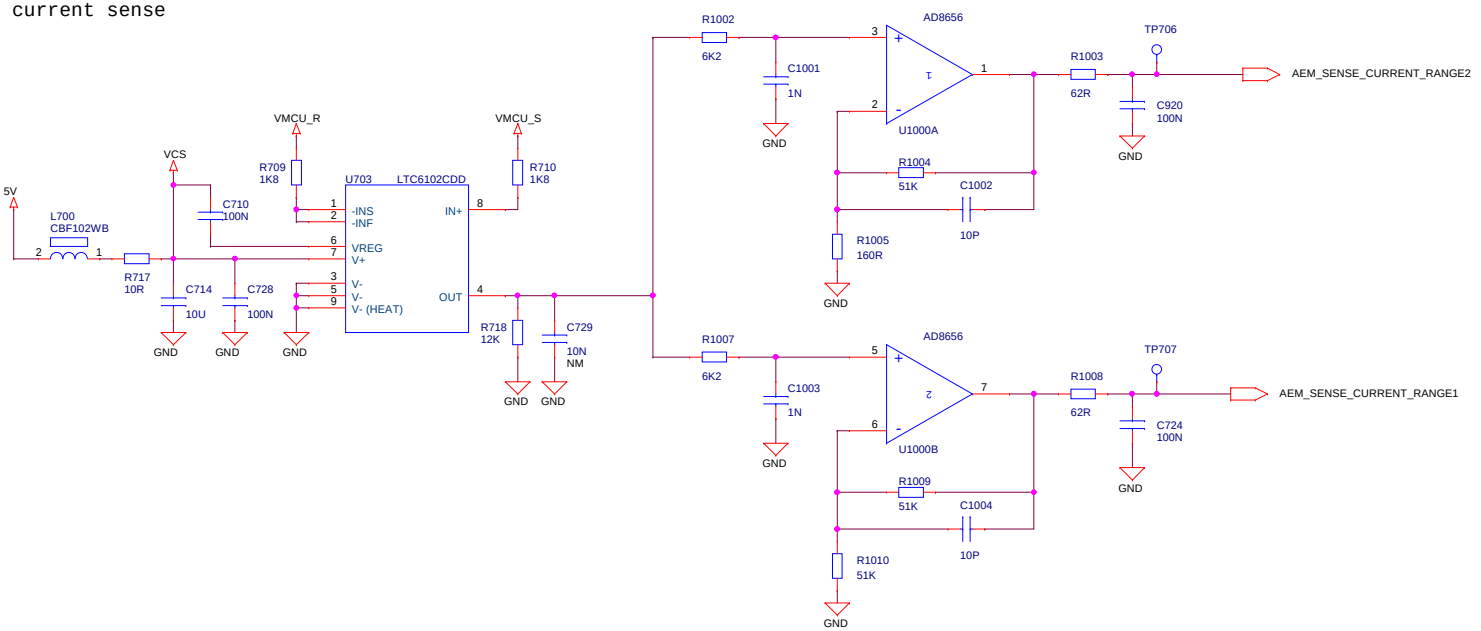


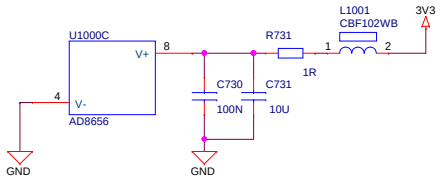
AEM_CTRL	Calibration Current
0x1	3.30 uA
0x2	100 uA
0x4	220 uA
0x6	320 uA
0x8	3.30 mA

MCU Voltage Sense



MCU current sense



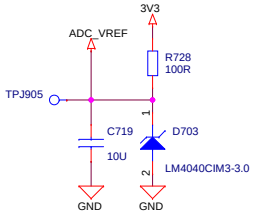


/Advanced Energy Monitor
AEM

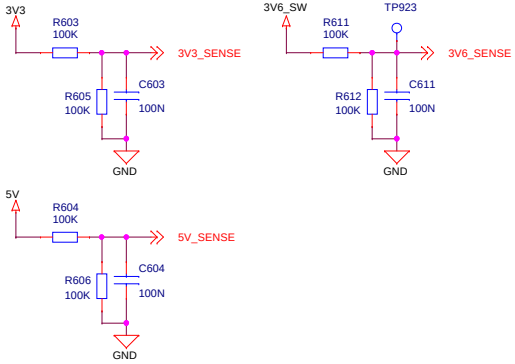
SILICON LABS

Schematic Title	EFM32 Zero Gecko Starter Kit
Page Title	Advanced Energy Monitor
Designed: <OrgAddr1> / Approved: <OrgAddr2>	
Size A3 / BOM Doc No: <Cage Code>	Document number BRD2010A / Revision B01
Design Created Date: Friday, August 09, 2013	Sheet Created Date Friday, August 09, 2013 / Sheet Modified Date Friday, March 13, 2015 / Sheet 9 of 10

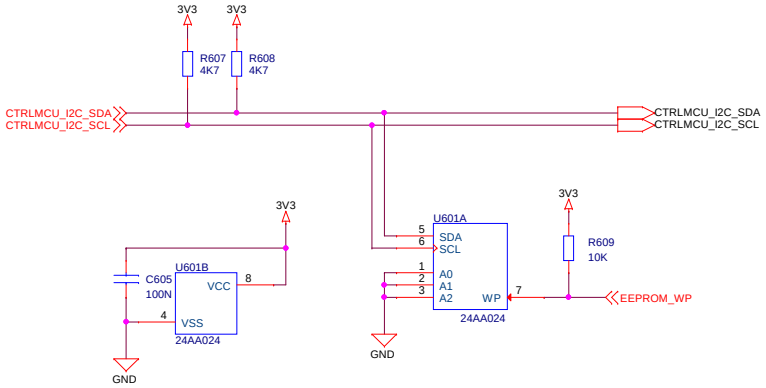
ADC reference voltage



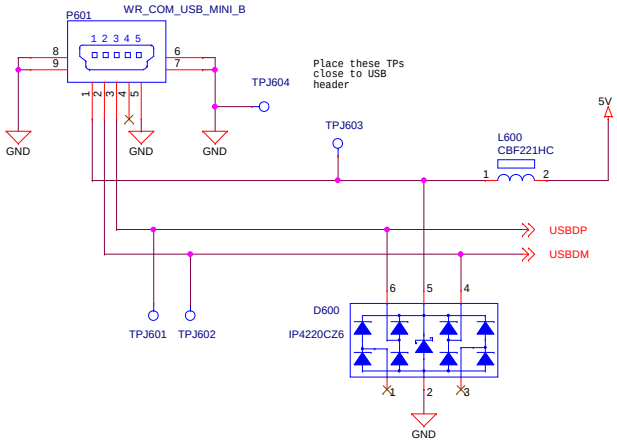
POWER SENSE



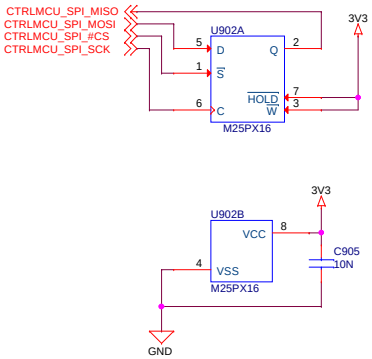
CTRLMCU EEPROM



J-Link USB Port



CTRLMCU SERIAL FLASH



/Board Controller
BOARD CONTROLLER

SILICON LABS		Schematic Title: **EFM32 Zero Gecko Starter Kit**	
		Page Title: **Board Controller Misc**	
Designed: ANB	Approved: JNO	Document number: **BRD2010A**	Revision: B01
Size: A3	BOM Doc No: <Cage Code>		
Design Created Date: Wednesday, June 12, 2013		Sheet Created Date: Wednesday, June 12, 2013	Sheet Modified Date: Friday, March 13, 2015
			Sheet: 10 of 10