




Title <b>Block Diagram</b>			Energy Auditor Sensor Node  University of Colorado Boulder 
Size: <b>A4</b>	Number: <b>1</b>	Revision: <b>1</b>	
Date: <b>10/26/2018</b>	Time: <b>12:57:17 AM</b> Sheet <b>1</b> of <b>6</b>		
File: <b>C:\Users\Preshit\Documents\GitHub\Low-Power-Embedded-Design\BT Mesh\Block Diagram.SchDoc</b>			

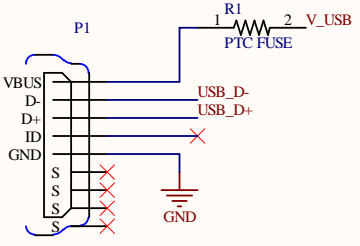
1

2

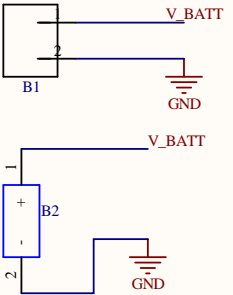
3

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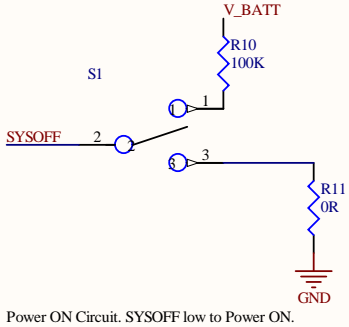
USB Supply Input



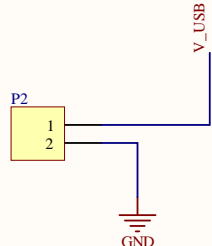
Battery Input



Power Switch

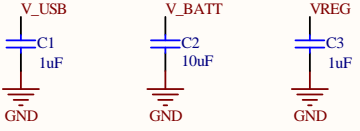


Alternate Supply Input

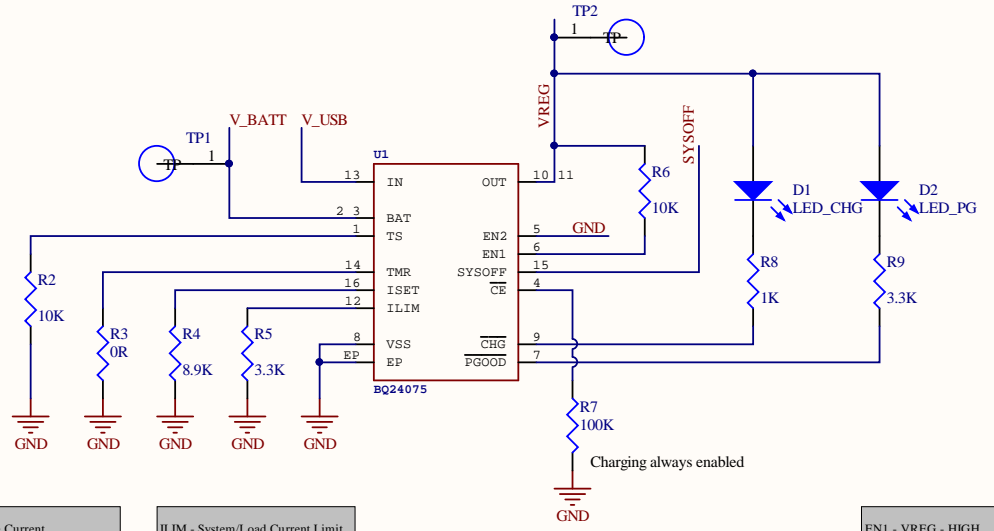


Will populate the header only for debugging

Decoupling Capacitors



PMIC

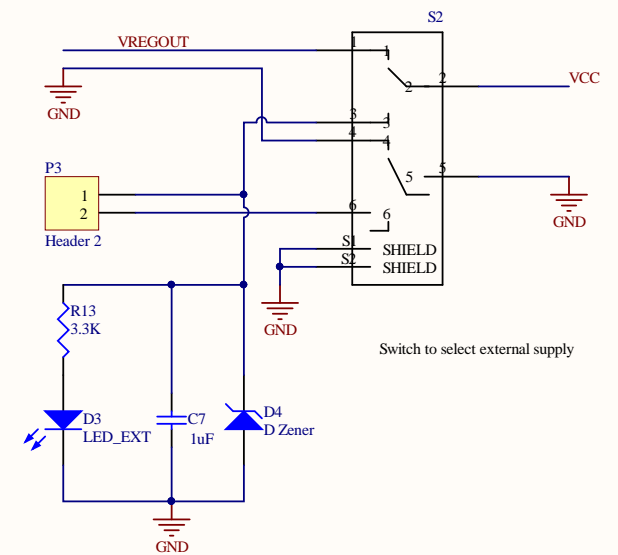
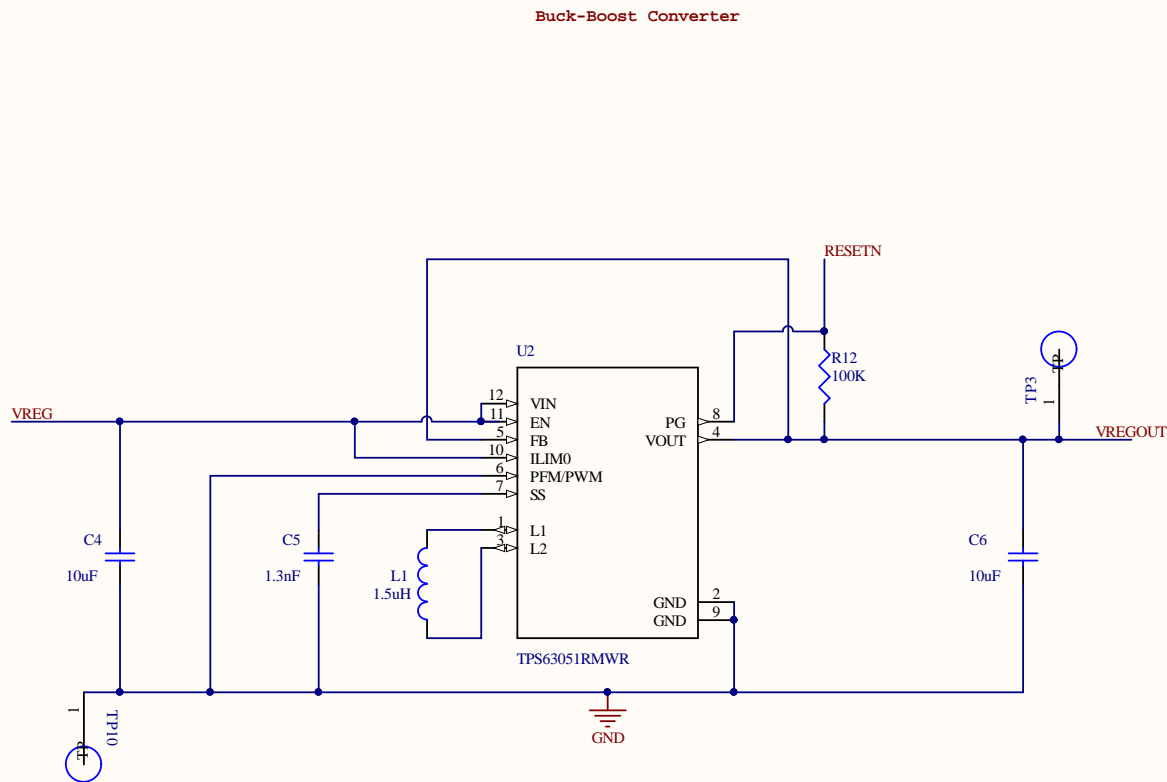



TMR - Safety Timers  
Sets precharge and fast-charge safety timers.  
- Connect to ground to disable

ISET - Charge Current  
I\_CHG of Battery is 100mA  
Sets fast charge current  
- R\_SET range: 590-8.9k  
- R\_SET = 885/I\_CHG  
- R\_SET = 885/0.1  
- R\_SET (R2) = 8.85 kOhm

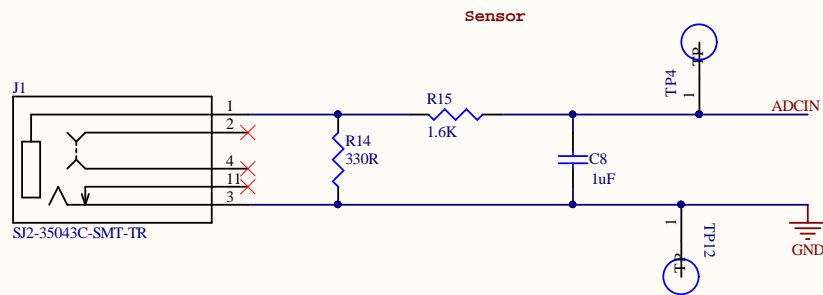
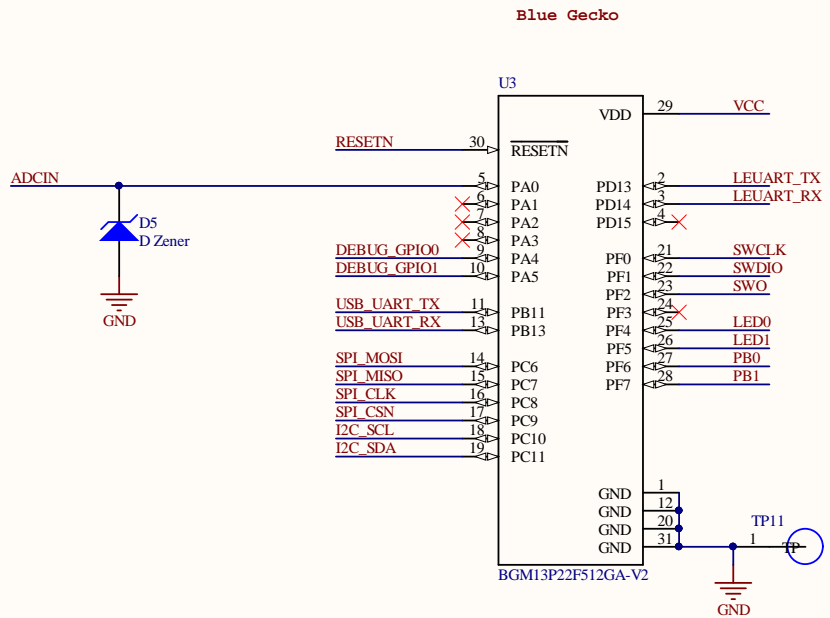
ILIM - System/Load Current Limit  
Limit Current (I\_INMAX) to 500mA  
- R\_ILIM = 1650/I\_INMAX  
- R\_ILIM = 1650/0.5  
- R\_ILIM (R3) = 3.3K

EN1 - VREG - HIGH  
EN2 - GND - LOW  
Limiting USB input current to 500 mA



Title <i><b>Regulator</b></i>			Energy Auditor Sensor Node	
Size: <i><b>A4</b></i>	Number: <b>3</b>	Revision: <b>1</b>	University of Colorado Boulder	
Date: <i><b>10/26/2018</b></i>	Time: <i><b>12:57:18 AM</b></i>	Sheet <b>3</b> of <b>6</b>		
File: <i><b>C:\Users\Preshit\Documents\GitHub\Low-Power-Embedded-Design\BT Mesh\Regulator.SchDoc</b></i>				






Peak Current - 20A  
 Sensor Turn Ratio - 1:2000  
 Peak CT Current - 10mA  
 ADC max voltage - 3.3V

$R11 = \text{ADC max voltage} / \text{Peak CT current}$   
 $R11 = 3.3 / 0.01 = 330R$

Low Pass Filter:  
 $\text{freq} = 1/2 * \pi * R12 * C6$

Title <i>Blue Gecko and Sensor</i>			Energy Auditor Sensor Node	
Size: <i>A4</i>	Number: 4	Revision: 1	University of Colorado Boulder	
Date: <i>10/26/2018</i>	Time: <i>12:57:18 AM</i>	Sheet <i>4</i> of <i>6</i>		
File: <i>C:\Users\Preshit\Documents\GitHub\Low-Power-Embedded-Design\BT Mesh\Gecko.SchDoc</i>				



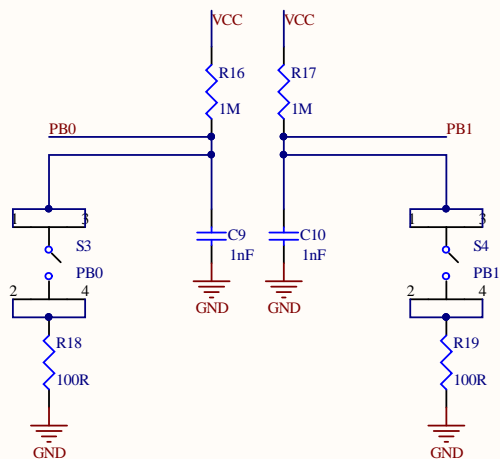
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2

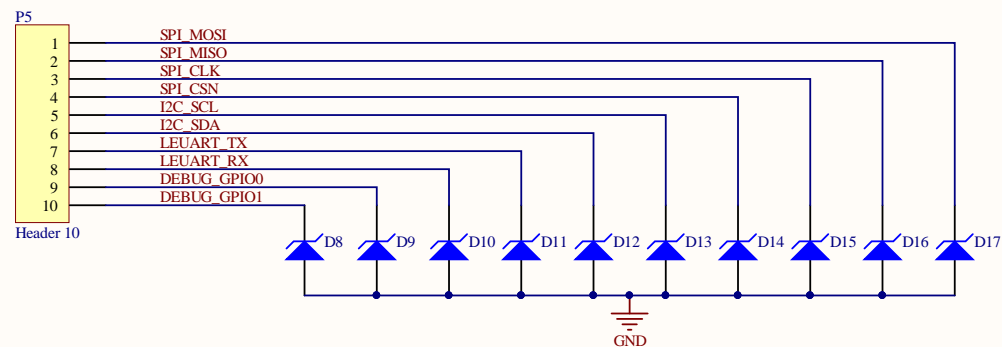
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4

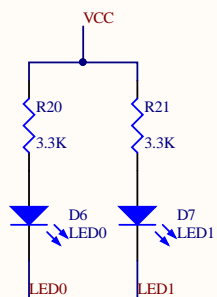
## Push Buttons



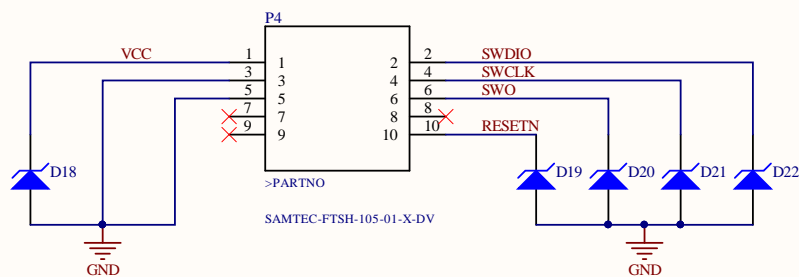
## GPIO



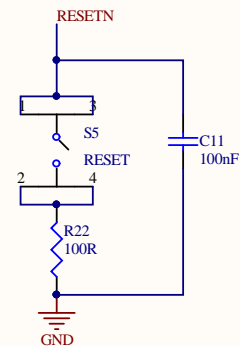
## Debug LEDs



## Debug Interface



## Reset Circuit



RESETN- Active LOW  
PGOOD HIGH - S4 OPEN -  
RESETN HIGH - MCU ON  
PGOOD LOW - S4 OPEN -  
RESETN LOW - MCU RESET  
PGOOD HIGH when regulator  
Vout greater 95% nominal output  
voltage i.e. 95% of 3.3V  
S4 CLOSED - PGOOD don't care -  
RESETN LOW - MCU RESET

Title <b>Gecko IO</b>			Energy Auditor Sensor Node
Size: <b>A4</b>	Number: <b>5</b>	Revision: <b>1</b>	University of Colorado Boulder
Date: <b>10/26/2018</b>	Time: <b>12:57:18 AM</b>	Sheet <b>5</b> of <b>6</b>	
File: <b>C:\Users\Preshit\Documents\GitHub\Low-Power-Embedded-Design\BT Mesh\Gecko IO.SchDoc</b>			

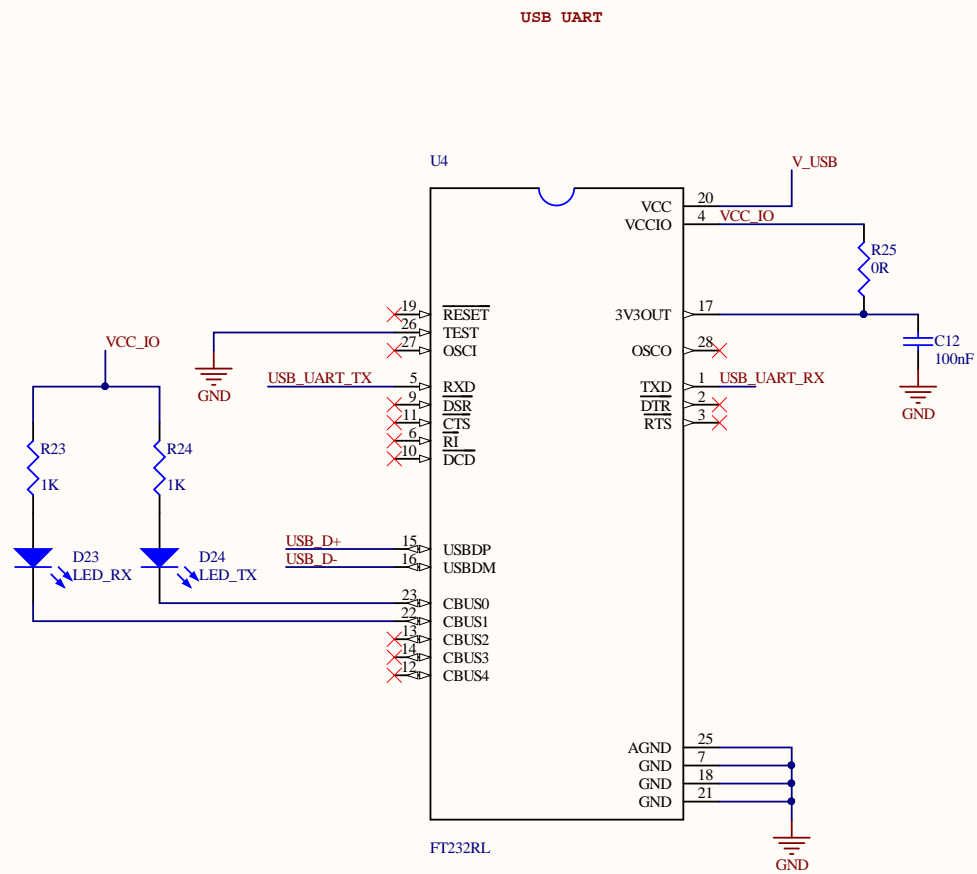
**Altium**


1

2

3

4



Title <i><b>USB UART</b></i>			Energy Auditor Sensor Node	
Size: <i><b>A4</b></i>	Number: <i><b>6</b></i>	Revision: <i><b>1</b></i>	University of Colorado Boulder	
Date: <i><b>10/26/2018</b></i>	Time: <i><b>12:57:18 AM</b></i> Sheet <i><b>6</b></i> of <i><b>6</b></i>			
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