



# Team Guava

# Final

# Presentation

## F17



SCEL

Smart Campus Energy Laboratory



# Overview

- Motivation/Goals
- Block Diagram
- Progress since CDR
  - Housing
  - Schematic
  - PCB Design
- Bill of Materials
- Problems
- Gantt Chart
- Questions



## SCEL Motivation

Guava is the fifth iteration in the weatherbox design. The main goal for Guava's weatherbox is to incorporate newer components into the existing SCEL weatherbox layout. The motivation of team Guava is to improve upon the recent generations by using a new processor.



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## Project Goals

Produce a self-sustaining environmental sensor module that will collect meteorological data

- Create a schematic
  - Properly integrate new processor
- Design and fabricate a printed circuit board
- Draft and build a weatherproof housing
- Test and Deploy the completed weatherbox

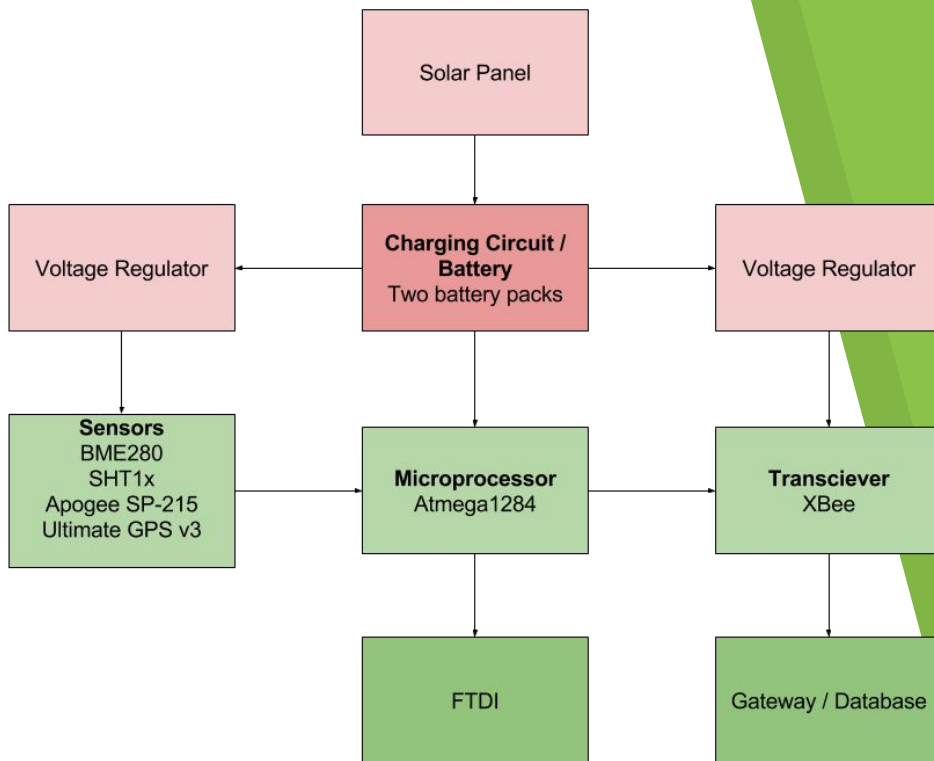


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## Block Diagram

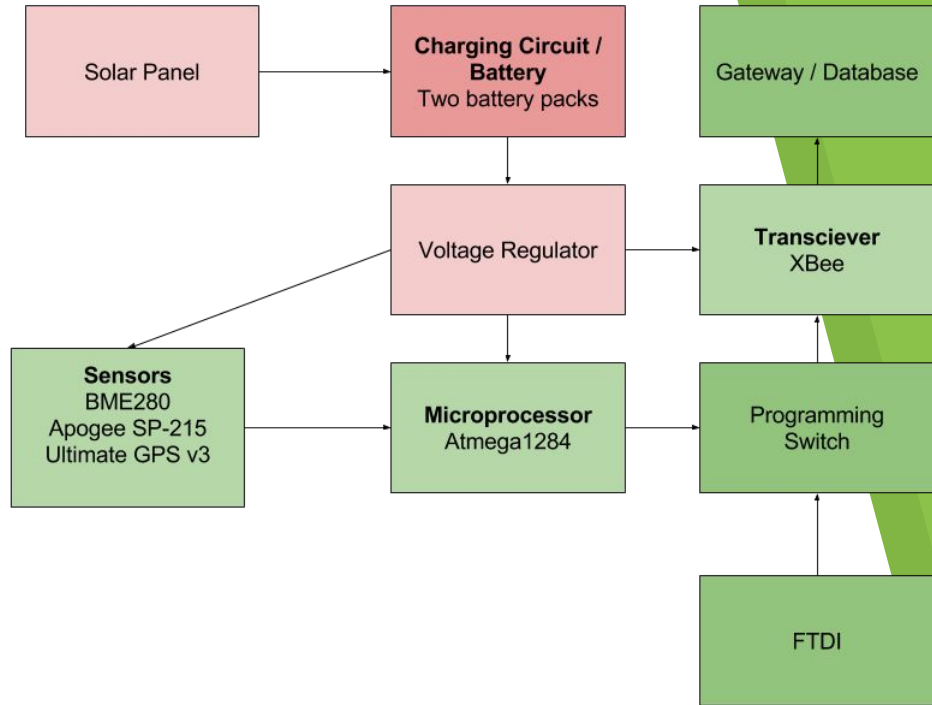
- Using just one 3.3V voltage regulator
- Not be using SHT11
- May change clock to lower MHz to decrease power consumption



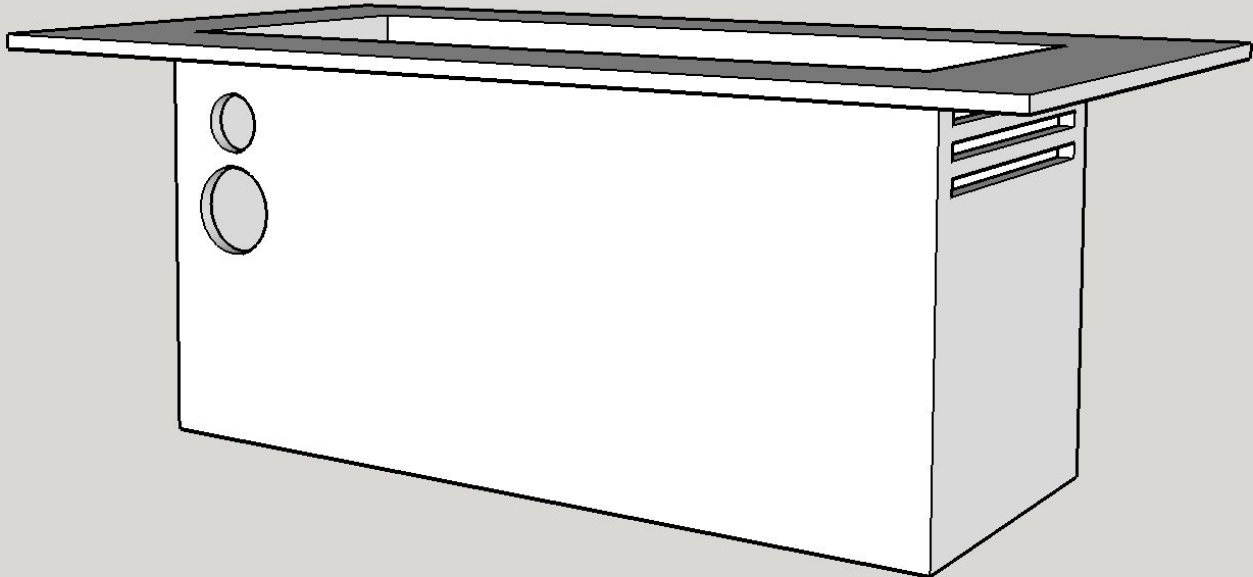


## Block Diagram

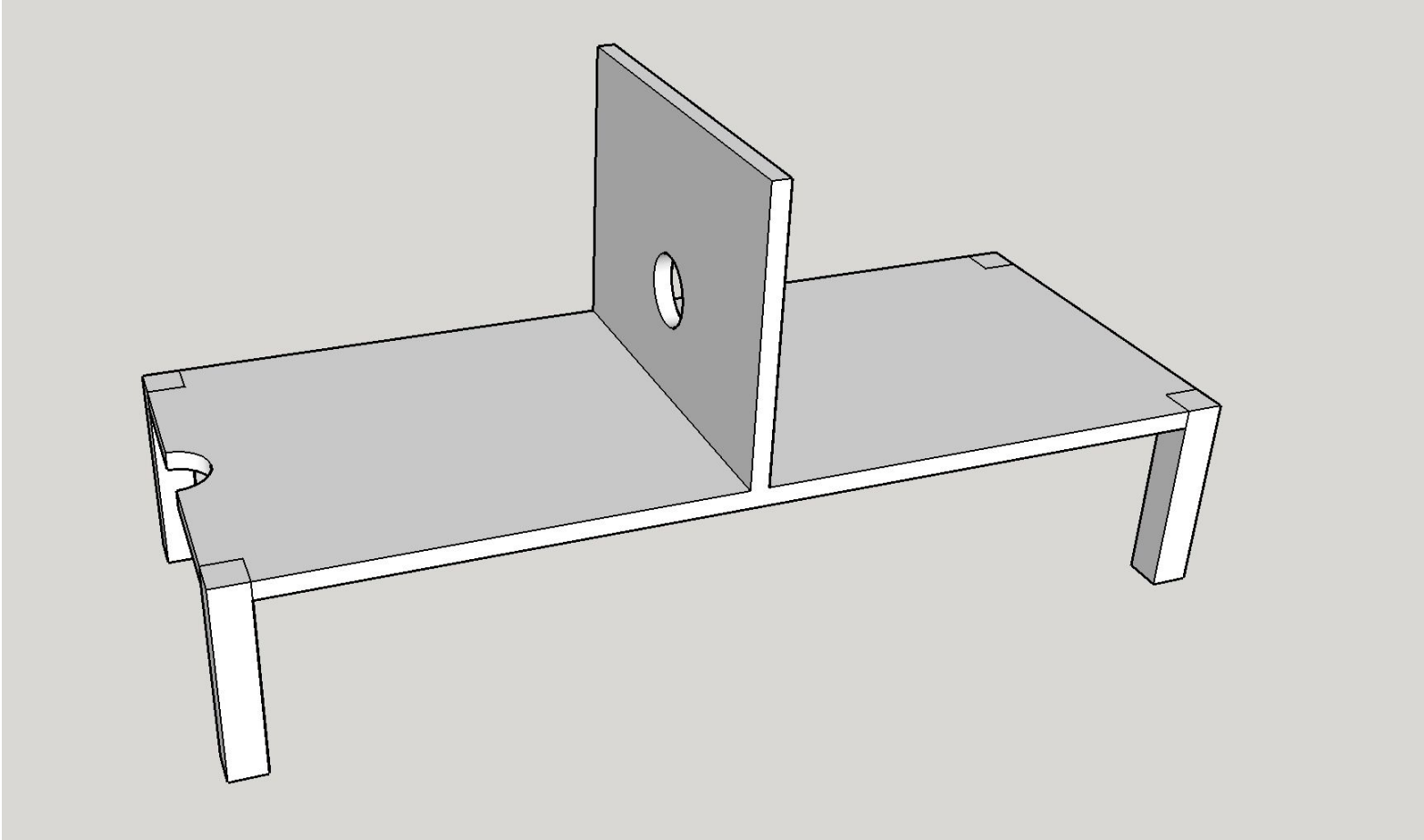
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# HOUSING

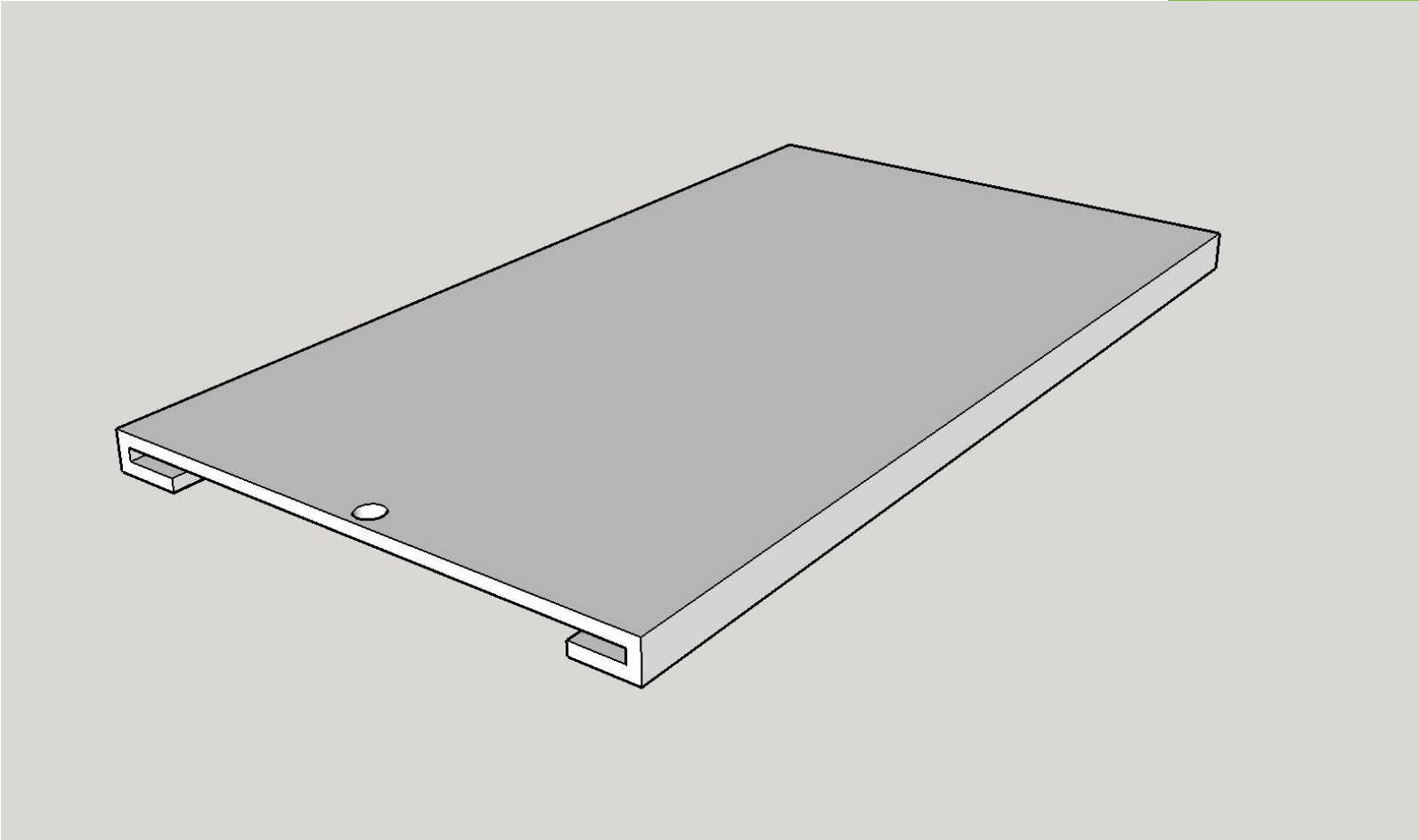


# HOUSING

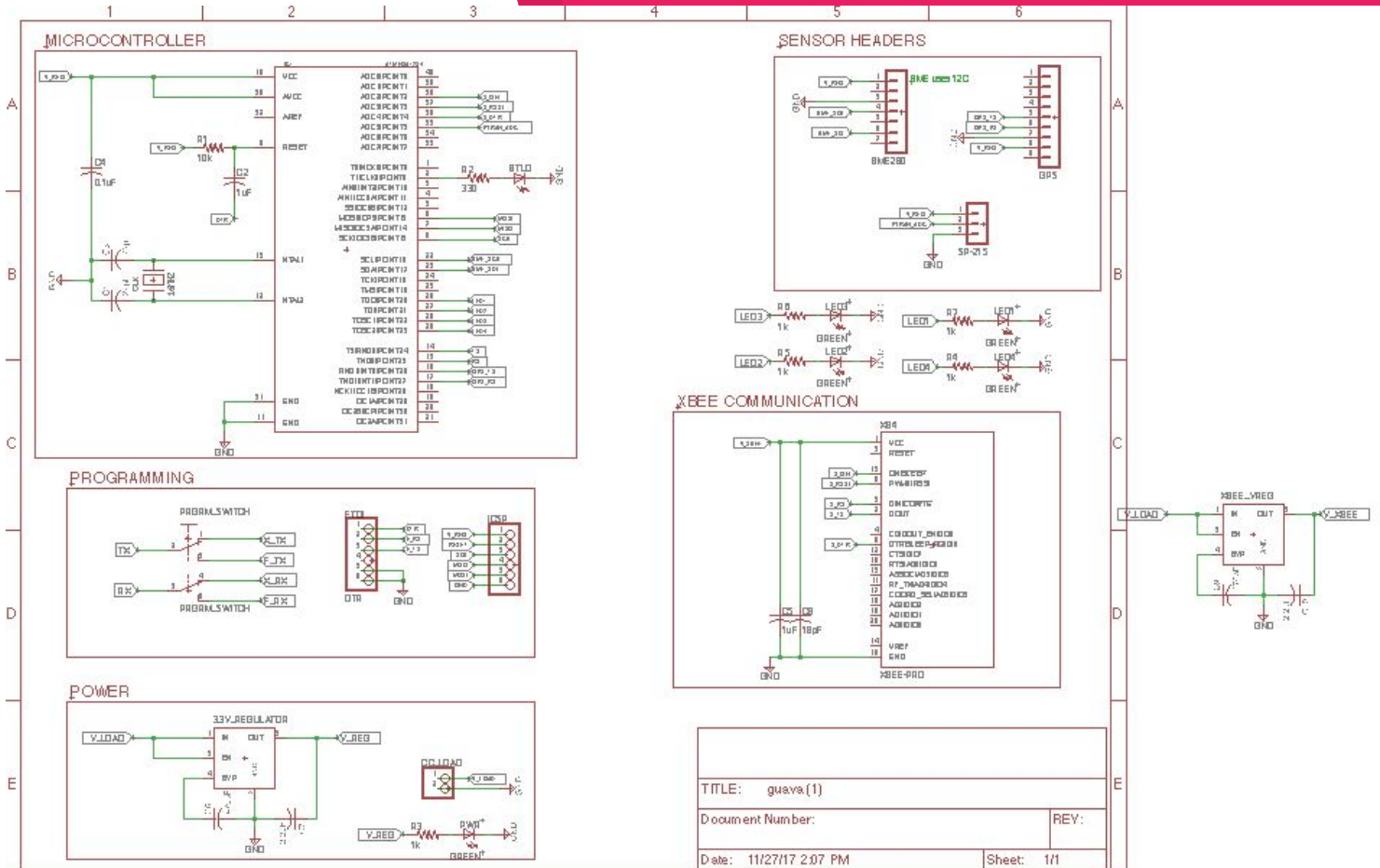




# HOUSING

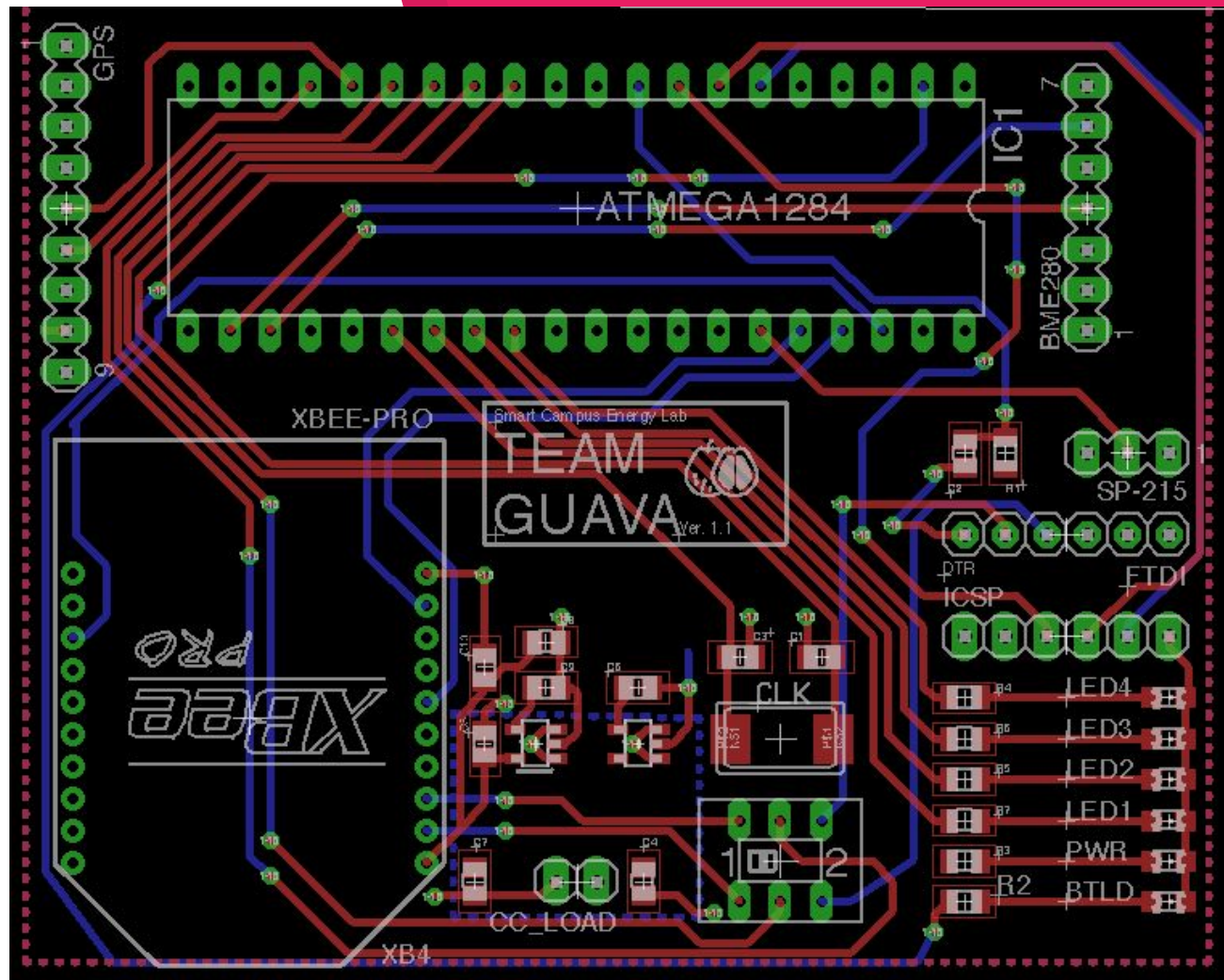


# Schematic



TITLE: guava (1)	
Document Number:	REV:
Date: 11/27/17 2:07 PM	Sheet: 1/1

# PCB



Part	Value	Device	Package	Description	MF	MPN	QTY	Price	Total Price		
3.3V_REGULATOR		MIC5219XX	SOT23-5	VOLTAGE REGULATOR	Digikey	MIC5219-3.3YM5-TR	2	0.93	1.86		Have
7x1 Pin Header		MA07-1	MA07-1	7x1 Pin Header for BME280	Sparkfun	PRT-00115	1	1.5	1.5		Have
2x1 Pin Header		PINHD-1X2	1X02	2x1 Pin Header for charging chip	Sparkfun	PRT-00115	1	0	0		Have
BTLD	RED	LEDCHIPLED_0805	CHIPLED_0805	Bootloader LED	Mouser	598-8110-107F	1	0.42	0.42		Have
C1	22pF	C-USC0805	C0805	SMD Capacitor	Digikey	490-5534-1-ND	2	0.34	0.68		
C2	1uF	C-USC0805	C0805	SMD Capacitor	Digikey	311-1365-1-ND	2	0.11	0.22		Have
C4	0.1uF	C-USC0805	C0805	SMD Capacitor	Digikey	478-1395-1-ND	1	0.1	0.1		
C6	470pF	C-USC0805	C0805	SMD Capacitor	Digikey	1276-1300-1-ND	2	0.1	0.2		Have
C7	2.2uF	C-USC0805	C0805	SMD Capacitor	Digikey	490-3336-1-ND	2	0.21	0.42		Have
C8	18pF	C-USC0805	C0805	SMD Capacitor	Digikey	1276-1107-1-ND	1	0.1	0.1		Have
CLK	16MHZ	XTALNX8045	NX8045	16MHz Crystal Oscillator for CPU clock	Digikey	535-10226-1-ND	1	0.25	0.25		Have
6x1 Pin Header	DTR	PINHD-1X6	1X06	6x1 Pin Header for ICSP and FTDI	Sparkfun	PRT-00115	2	0	0		Have
9x1 Pin Header		MA09-1	MA09-1	9x1 Pin Header for GPS	Sparkfun	PRT-00115	1	0	0		Have
IC1	ATMEGA1284	MEGA1284	DIL40	Atmel ATmega1284P 8-bit AVR Microcontroller	Digikey	ATMEGA1284-PU	1	5.25	5.25		Have
LED1	GREEN	LEDCHIPLED_0805	CHIPLED_0805	Debugging LED	Digikey	APT2012SGC	5	0.39	1.95		Have
PRGRM_SWITCH		A68-A31	A68-A31	SLIDING SWITCH for programming	Digikey	401-2002-1-ND	1	0.46	0.46		
R1	10k	R-US_R0805	R0805	RESISTOR, American symbol	Digikey	311-10KARCT-ND	1	0.1	0.1		Have
R2	330	R-US_R0805	R0805	RESISTOR, American symbol	Digikey	RMCF0805JT330RCT-ND	1	0.1	0.1		
R3	1k	R-US_R0805	R0805	RESISTOR, American symbol	Digikey	RC0805JR-071KL	5	0.1	0.5		Have
3x1 Pin Header		MA03-1	MA03-1	3x1 Pin Header for SP-215	Digikey	732-5316-ND	1	0.13	0.13		Have
XBEE Sensor	XBEE-PRO	XBEE-PRO	XBEE-PRO	Headers for Xbee	Sparkfun	PRT-00115	1	0	0		Have
BME280		BME280	Breakout Board	Pressure/Temp/Humidity Sensor	Adafruit	2652	1	19.95	19.95		Have
GPS v3		GPS v3	Breakout Board	GPS/RTC Sensor	Adafruit	746	1	39.95	39.95		Have
SP-215		SP-215	Sensor	Irradiance Sensor	Apogee		1	285	285		Have
PCB				Printed Circuit Board			1	33	33		
									392.14		
									34.34		



# Bill of Materials



## Problems Encountered

- Housing-exact dimensions (antennae)
- Not enough current to XBee
- Ordering PCB board
- Some PCB details (help from Kyle)

Guava															
(Gantt Chart)															
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date	9/4/2017	9/11/2017	9/18/2017	9/25/2017	10/2/2017	10/9/2017	10/16/2017	10/23/2017	10/30/2017	11/6/2017	11/13/2017	11/20/2017	11/27/2017	12/4/2017	12/11/2017
<b>Presentations</b>															
Proposal			9/18/17												
PDR					10/14/17										
CDR									11/10/17						
Final												12/2/17			
<b>PCB Design</b>															
Schematic															
Board Layout															
Review															
<b>Housing</b>															
<b>Build</b>															
Fabrication Time															
Testing															
<b>Reports</b>															
Final Report															



# Gantt Chart



## Final Status

- Finished PCB design and schematic
- Almost finished with housing
- Ordered board
- Ordered parts for PCB



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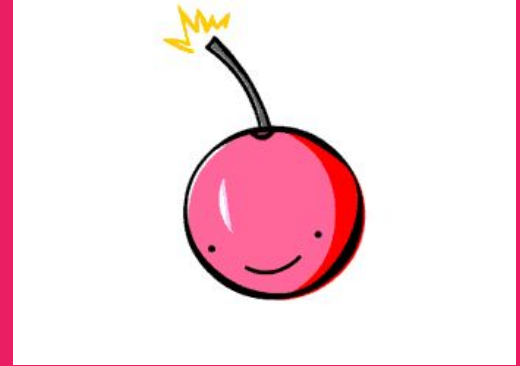


**Thank you!**  
**Any Questions?**



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