Gridless Wireless Network
Specific Design Detail

Team name:

Off the Grid

Team members:

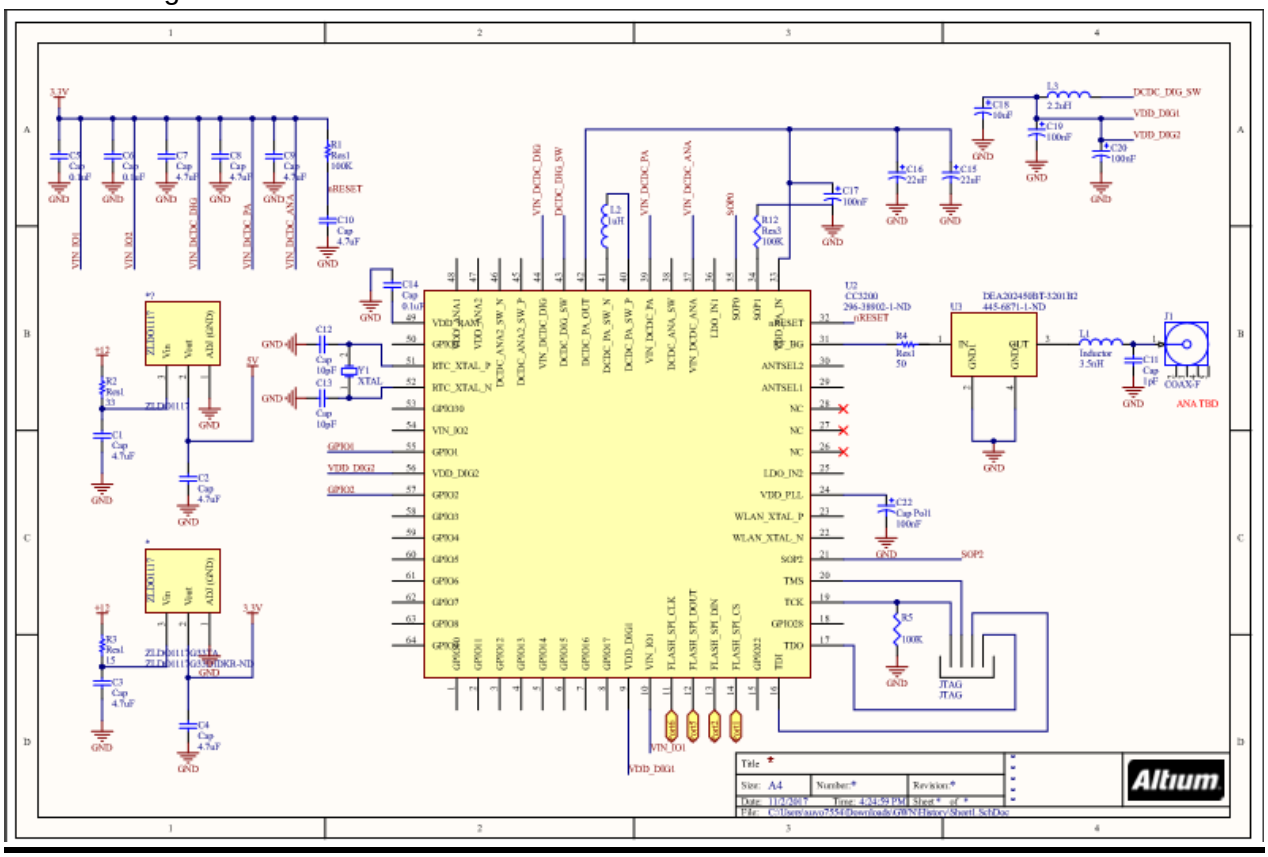
Ian Schneier
Linda Palacios
Weikang Zhang
Xucheng You
Jingwen Luo
Alec Motazedi

Project Sponsor:

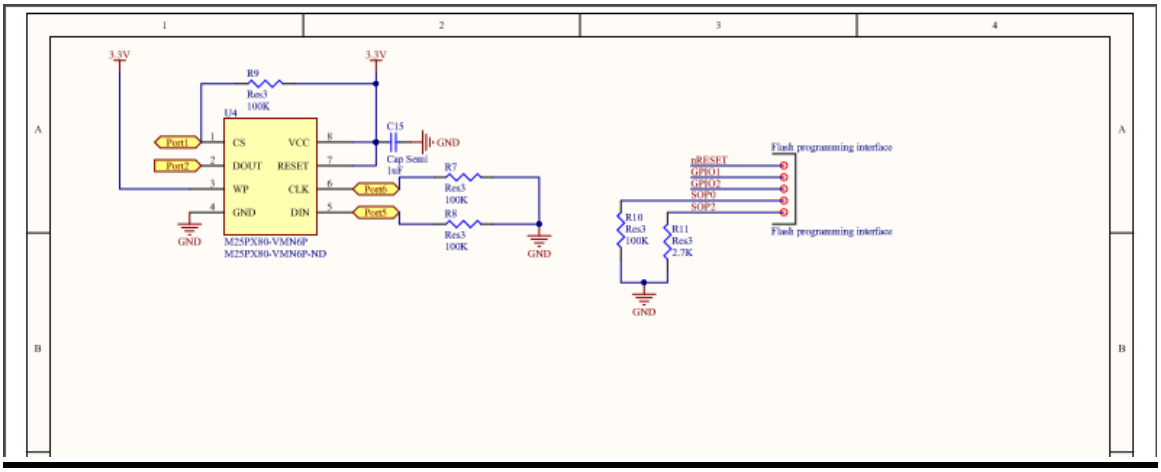
Prof. Alan Mickelson

Circuit and Logic diagrams, labeled parted

Schematic figure 1:



Schematic figure 2:



Budget generated from schematic:

LibRef	Footprint	Comment	Designator	Manufacture	Description	Quantity
ZLDO1117G3	SOT223	ZLDO1117G33TA	U5	Digikey	IC REG LDO 3.3V 1A SOT223	1
ZLDO1117	SOT223	ZLDO1117	U1	Digikey		1
Cap	0603	Cap	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15	Digikey	Capacitor	14
Cap Semi	C1206	Cap Semi	C15	Digikey	Capacitor (Semiconductor SIM Model)	1
Cap Pol1	RB7.6-15	22uF	C15, C16	Digikey	Polarized Capacitor (Radial)	2
Cap Pol1	RB7.6-15	100nF	C17, C19, C20	Digikey	Polarized Capacitor (Radial)	3
Cap Pol1	RB7.6-15	10uF	C18	Digikey	Polarized Capacitor (Radial)	1
Cap Pol1	RB7.6-15	Cap Pol1	C22	Digikey	Polarized Capacitor (Radial)	1
Flash program		Flash programming interface	Flash programming interface	Digikey		1
COAX-F	MCX5.08-H5	COAX-F	J1	Digikey	RF Coaxial PCB Connector, MCX; Thru-Hole	1
JTAG		JTAG	JTAG	Digikey		1
Inductor	0603	Inductor	L1	Digikey	Inductor	1
Inductor	0402-A	Inductor	L2, L3	Digikey	Inductor	2
Res1	AXIAL-0.3	Res1	R1	Digikey	Resistor	1
Res1	0603	Res1	R2, R3, R4	Digikey	Resistor	3
Res3	J1-0603	Res3	R5, R7, R8, R9, R10, R11, R12	Digikey	Resistor	7
CC3200	VQFN	CC3200	U2	Digikey		1
DEA202450BT		DEA202450BT-3201B2	U3	Digikey	FILTER BANDPASS 2.45GHZ WLAN SMD	1
M25PX80-VM		M25PX80-VMN6P	U4	Digikey	MICRON M25PX80-VMN6P Fl	1
XTAL	R38	XTAL	Y1	Digikey	Crystal Oscillator	1
						45

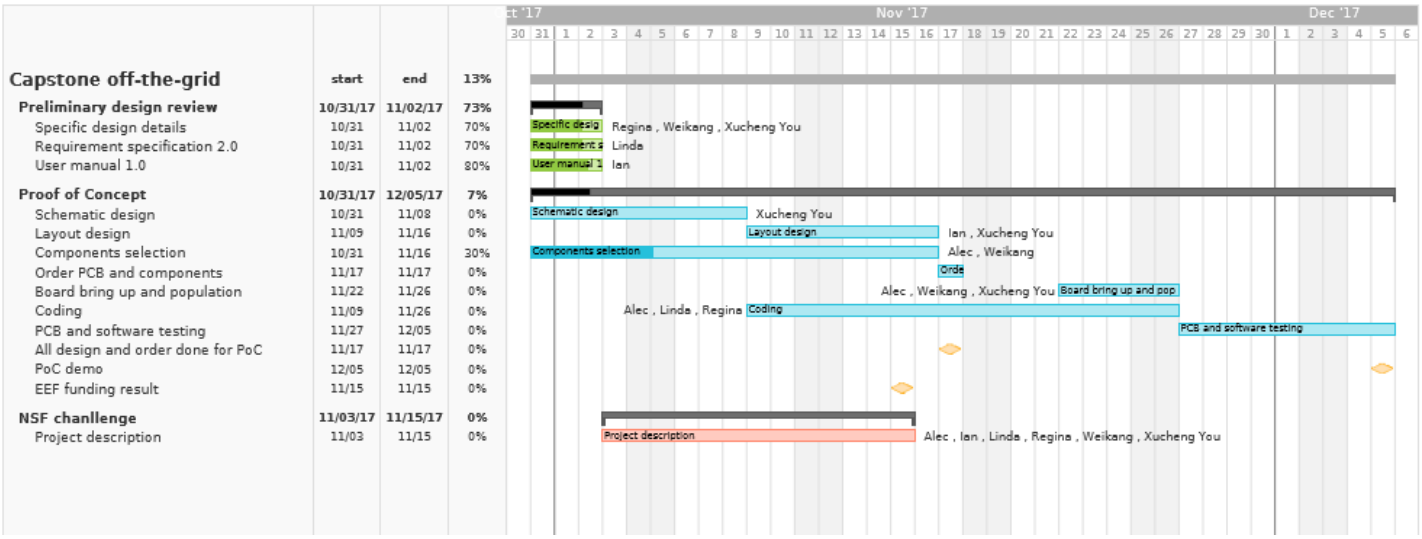
*The budget is list under the excel file call “Budget’

*Sponder proof of our overall budget have been upload to another file called “Bill of Materials and Sponsor approval for overall budget”

Responsibilities, roles

Name	Operational	Technical/Functional
Zhang	Signal Processing	Power and Communications
Regina	Codebase Manager	Software/Applications
Ian	Co-lead	Hardware/Embedded
Alec	Finance Manager and Documents Manager	RF and Software/Applications
Xucheng	Co-lead	Power
Linda	Communications Manager	Embedded and Software/Application

Division of labor



Risk

The risks that our project has are organized into three categories: hardware, communications, and software.

For hardware, the concerns revolve around the reliability of the components and parts that are used. The biggest risk in this category is that the battery life will be less than the desired 72 hours, which can be mitigated by selecting power efficient circuit elements. Also, because the battery will be rechargeable the charging port may possibly be exposed to water so the charging port must be designed to be waterproof. Consideration is also made regarding the risk of the device falling so the enclosure must be designed to resist the impact force of hitting the ground from a certain height so the device remains intact. Weight distribution is another concern since the device cannot operate properly if it tips over so we have to ensure our final design is bottom heavy to ensure it stays upright when exposed to strong winds and other phenomena that could knock it down.

Concerns regarding the communications focus on the reliability of the system to provide a reliable connection. One of the issues relating to this is the possibility of the device being unable to provide the acceptable data bandwidth to handle the anticipated amount of users connected to the network. Besides user capacity, attention should be given to which antenna will be selected for the final design so that the final design for our product will have the best signal reception possible.

In terms of software related risks the biggest concern is ensuring that the devices can successfully pair with each other. If any issues arise that impede this then our product will be an utter failure. Besides having the devices close to each other to ease pairing, software based solutions will have to be devised to mitigate any difficulty that can occur from the devices performing their primary function of creating the mesh network communication system. We also need to ensure that any data that can be gathered such as location, connected device battery life, and other information concerning the well being of the users will be gathered effectively so that the relief organizations that will use our product will be correctly informed regarding who needs help and where.