**Date: 2/13/2014-2/19/2014**

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| **Group Number and Name** | **#14 Low Cost RF power meter** |
| **Client/Advisor** | **Dan Stieler/ Prof Neihart** |
| **Attendees/Role** | **Silu Feng/leader Xiaoshuo Li,Yusi Xie/Key idea holder Yijia Huang/webmaster Boyang Hu,Cong Han/Communicater** |

# Past week accomplishments

What was done, who did it, and when it was done

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| * The directional coupler group wrote the project plan, including abstract, problem, statement, system block diagram, system description, operation system.
* The directional coupler group looks up the market and find where to buy the components and the price of it.
* The diode group did the ADS and CADENCE simulation. Calculate the load resistor and filter parameter.
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# Plan for coming week

What to do, who, and when should it be done

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| * The diode and directional coupler group will run the simulation on the ADS software.
* We will debug the errors during the simulation and improve our design.
* The coupler group will determine the size of the box. They will buy parts online in the coming week.
* The coupler group will recalculate the values they got, such as transmission line, torids. And then they will give a list of the component, where to buy and how much.
* The diode group will divide the work. Xiaoshuo Li runs the simulation, Boyang Hu figure out the transition region, Cong Han figure out the frequency domain and time domain.
* The diode group will use harmonic bias as the tool and import Pspice model of diode into ADS.
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# Pending Issues

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| * We need to learn how import PSPICE model into ADS.
* We need to go to Power Film Company to see what kind of source the power comes from.
* We need to debug the design after simulation.
* We need to find where to buy the components and find the cheapest one.
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# Individual Contributions

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| Yijia Huang wrote the Project Plan include:Abstract, Problem, Statement, System block diagram, System description, Operating environment, Market and literature survey, Work plan, Project schedule and Risks. (3 hrs)Trying to figure out how to do simulation with ADS. (2hrs)Reviewing previous calculation that includes: forward voltage in terms of the forward line voltage, reverse voltage in terms of the forward line voltage, forward voltage in terms of the reverse line voltage and the reverse voltage in terms of the forward line voltage, the voltages and currents that will be applied to the transformers for 20 dBm to 60 dBm, and the forward and reverse voltages. and schematic about directional coupler. (1 hr).Connect our website to Iowa State University's database. (1 hr)* Silu Feng selected the type of product (Coaxial, Toroid core, copper wire, N-type connector, enclosure)(3h) Discuss the material list with Yijia Huang. (1h)

Studying how to calculate the wire gauge.(Searching the formula on the Internet, found the wire gauge calculator to calculate what size of wire gauge we can use.)(1h)Research the resources of how to build coupler and look at how it wrap the toroid. Also search the N-type connector which they used and then compare to what we choose. Trying to search how to cut the enclosure. Then talk with Yusi Xie. (1h)Thinking about using which software to do the simulation and learn little about ADS.(1h)).* Xiaoshuo Li did ADS simulation (2 hours), CADENCE simulation (2 hour),Calculation of load resistor and filter parameter (1 hour).
* Boyang Hu calculates the value of the load resistor, analyses the calculation of detector circuit. (2 hour). Research and collect the specification data for the diode detector components (such as load resistor, diode and capacitor in the circuit)(1 hour).Learn how to use ADS software and cooperate with Xiaoshuo Li (2 hours).
* Cong Han start learning the basic ADS software like how to start, add, built and draw the graph(1.5 hours). Review Pspice simulation (0.5 hour). Anylize filter parameter(0.5), calculate filter parameter(1 hour). Help on the project plan (0.5). Analysis of the small signal assumption (1 hour) and help xiaoshuo calculate load resistor (0.5).
* Yusi Xie go through Chapter 11 about transmission line from the EE 311 textbook to learn the transmission line parameters (resistance, inductance, conductance and capacitance equations), learn how to calculate those parameters for specific coaxial lines (RG-8x) (2h)

Research how others build couplers like what we will do. How they wrap the toroid and their coupler components (types of N-connectors, transmission lines, toroid and shield). How to create the shield (the shield I didn’t find the detailed way to build). Discuss with Silu on this part(2h)Get all the calculation progress and scan them to store them. Make a file to write down all the data in the coupler group so far. (The voltages and currents will applied to the transformers, forward and reverse voltages, the winding ratios and toroid types) (1.5h)Learn from the transformer design slides about if we use 1: N type winding, we will have large conductance, we may need use Litz wire or parallel strands of wire. Still searching the difference and if we need to use that. Besides, we need may need consider the loss on wires (we still calculate the ideal system so far). (1.5h) |

Individual hourly Contributions

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| **NAME** | **Hours this week** | **HOURS****Cumulative** |
| Silu Feng | 6 | 32 |
| Xiaoshuo Li | 5 | 41 |
| Yijia Huang | 6 | 32 |
| Boyang Hu | 5 | 29 |
| Cong Han | 7 | 31 |
| Yusi Xie | 7 | 33 |

# Comments and extended discussions:

We did a great work in the past week. We start to do the simulation and buy component online. We are following the project plan. We will start building the circuit in the next two weeks.