**Date: 2/15/2014**

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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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| * We divide into two groups to research directional coupler and diode detector. Yijia Huang,Silu Feng and Yusi Xie are in the directional coupler group. Xiaoshuo Li, Boyang Hu and Cong Han are in the diode detector group. * The directional coupler group look up tandem directional coupler online. They figured out what torid transformers to use, how many turns should we use in the transformer and finish the circuit design of directional coupler. They figured out to use RG8X to be the transmission line with 50 ohm impedance. They also calculate the value of each circuit element and share the data with the detector group. * The diode group complete the schematic diode detector. Build a circuit model for the junction diode. Research the I-V characteristic of Schottky diode. The diode group select HSMS-282L as the choice. They also match the impedance. Analysis the power under square law and linear region. |

# 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. |

# Pending Issues

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| * We need to learn how to use ADS software. * We need to go to Power Film Company to see what kind of source does the power come from. * We need to debug the design after simlulation. |

# Individual Contributions

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| * Yijia Huang draw a detailed schematic with a detailed analysis of the system. Include the 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. Calculate the voltages and currents that will be applied to the transformers for 20 dBm to 60 dBm. Calculate values for the forward and reverse voltages. Search for different types of toroid and choose the right one that matches our requirements. Also search for wire gauge and choose the size of wire we will use. * Silu Feng derive the requirement for the toroid,try to find the wire gauge. Then I found what kind of transmission lines, type-N connectors,enclosure, shield we will use, and also found where we can buy it. * Xiaoshuo Li did the Schematics of diode detector,the equivalent circuit mode of diode under AC,Diode junction resistance at zero bias and small DC bias, Derivation of output voltage & power when input power is in both square law region and linear region, Dertermine the load resistor and capacitor under above conditions. * Boyang Hu calculates and analysis the voltage limits in square law region. Research the voltage offset for Schottky diode. Also research the diode performance under linear region. * Cong Han search the diode spec online and provide some choices for the diode. Research the diode I-V characteristic online. * Yusi Xie cooperate with Silu Feng to figure out the transformer. Found what transmission line to use, the connector type and where to buy it. |

Individual hourly Contributions

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| **NAME** | **Hours this week** | **HOURS**  **Cumulative** |
| Silu Feng | 8 | 22 |
| Xiaoshuo Li | 8 | 22 |
| Yijia Huang | 8 | 22 |
| Boyang Hu | 8 | 22 |
| Cong Han | 8 | 22 |
| Yusi Xie | 8 | 22 |

# Comments and extended discussions:

We did a great work in the past week. We finish the circuit design of directional coupler and diode detector. We figure out how does these two parts work. We will run the simulation in the next week.