

|  |  |
| --- | --- |
| Memorandum  To: E. Santi  From: L. Merza | The Campus of The USC  Columbia, South Carolina 29208  20 March 2013  Email: Ljmerza@gmail.com |
| Subject: Technical Memorandum: Inductor Project Design. | |

This memo studies how to make an inductor. Specifically, the inductance and the DC resistance will be measured. First, the inductor was built by certain specifications. Copper wire was used in 18 turns with an air gap thickness of 88.9 mm. In order to measure the inductance of the inductor, the inductor is placed in series with a small resistor. The transfer function over the resistor is then found and is in figure 1. A sine signal is applied to the circuit and the frequency is raised until the gain of the circuit is at 0.5. This frequency was found to be 49.30 kHz. The resistor valued used was 22 Ω. Solving for the inductance, L, the equation becomes figure 2. The inductance was found to be 123.015 µH. Once the inductance was found, a 3A current was applied to the inductor only and the voltage across the inductor was measured as 39.26mV. With Ohm’s law, the DC resistance of the inductor came out to be 13.0867 mΩ.

**Appendix**

|  |  |
| --- | --- |
|  | (1) |
|  | (2) |