Lab 12 – Series/Parallel Inductors

Names: ­­­­­­­­­­­­­­­Nathaniel Paulus

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The purpose of this lab is to:

Experiment with series circuits and parallel combinations of inductors.

The following inductors are needed (1 each of the following): 1mH, 2.2mH and 4.7mH

Measure and record the inductance of each inductor using the LCR meter. Connect the inductors as shown in Figure 1 and measure and record the total inductance, LT. Then connect the inductors as shown in Figure 2 and measure and record the total inductance, LT.

Equipment needed:

1 – LCR Meter



Figure 1

**Series Circuit**

1 – Elvis II

3 – Inductors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Simulated | Measured |
| L1 = | 1mH | 1mH | 1.1349mH |
| L2 = | 2.2mH | 2.2mH | 2.4152mH |
| L3 = | 4.7mH | 4.7mH | 4.7289mH |
| LT = | 7.9mH | 7.90014mH | 7.5777mH |

Expected = value you expect it to be

Simulated = using Multisim

Measured = using LCR Meter

|  |  |  |  |
| --- | --- | --- | --- |
|  | Expected | Simulated | Measured |
| L1 = | 1mH | 1mH | 1.1349mH |
| L2 = | 2.2mH | 2.2mH | 2.4152mH |
| L3 = | 4.7mH | 4.7mH | 4.7289mH |
| LT = | 0.599768mH | 599.82571uH | 0.60989mH |

Expected = value you expect it to be

Simulated = using Multisim

Measured = using LCR Meter



Figure 2

**Parallel Circuit**

Observations: For each of the inductors I measured the measured value was greater than the nominal value. However, when I measured them in series the measured value was less than the sum of the values. This suggests that a significant part of the error is due to the meter, not the inductors it is measuring.