**中山大学**

**电路与电子学实验课程实验报告**



实验主题\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

实验时间\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

姓名 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

学院 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

实验日期 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |
| --- |
| **实验目的**  1.分析R、L、C取不同值时对电路的影响。  2.探究电源频率对L、C元件阻抗特性的影响。  3.探究元件的阻抗角受电源频率的影响。 |
| **实验原理**  1.阻抗元件在电路中的抗流作用与信号的频率有关。  2.在实验过程中，可以根据实际需要，在R、L、C、f中，定三调一。 |
| **注意事项**  1.测量电流的时候测量r的电流，因为测阻抗元件的电流可能会受到电源频率的影响。  2.接通电容时，电源频率最高不要超过2500Hz。 |
| **实验仪器、设备**  示波器1台，实验箱1台（含可调电阻，电感，电容），导线若干，数字万用表1台。 |
| **实验步骤**  1.设定电源为正弦波信号，有效值U=3V，保持不变。输出频率f=200Hz~5KHz，逐渐变化。  2.定好测量频率，并在每个频率之下分别接R、L、C三个元件，使用交流电表测量UR/L/C及Ur。  3.计算各频率点的R、XL、XC的值。  4.观察各频率点的阻抗图像。 |
| **仿真图纸** |
| **仿真数据表格**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | 频率f（Hz） | 200Hz | 1000Hz | 1800Hz | 2500Hz | | UR |  |  |  |  | | IR |  |  |  |  | | Ur |  |  |  |  | |  |  |  |  |  | | UC |  |  |  |  | | IC |  |  |  |  | | Ur |  |  |  |  | |  |  |  |  |  | | UL |  |  |  |  | | IL |  |  |  |  | | Ur |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 频率f（Hz） | 3000Hz | 3500Hz | 4000Hz | 4500Hz | 5000Hz | | UR |  |  |  |  |  | | IR |  |  |  |  |  | | Ur |  |  |  |  |  | |  |  |  |  |  |  | | UL |  |  |  |  |  | | IL |  |  |  |  |  | | Ur |  |  |  |  |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **实验数据表格**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | 频率f（Hz） | 200Hz | 1000Hz | 1800Hz | 2500Hz | | UR |  |  |  |  | | IR |  |  |  |  | | Ur |  |  |  |  | |  |  |  |  |  | | UC |  |  |  |  | | IC |  |  |  |  | | Ur |  |  |  |  | |  |  |  |  |  | | UL |  |  |  |  | | IL |  |  |  |  | | Ur |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 频率f（Hz） | 3000Hz | 3500Hz | 4000Hz | 4500Hz | 5000Hz | | UR |  |  |  |  |  | | IR |  |  |  |  |  | | Ur |  |  |  |  |  | |  |  |  |  |  |  | | UL |  |  |  |  |  | | IL |  |  |  |  |  | | Ur |  |  |  |  |  | |
| **实验结论** |
| **实验数据误差分析** |
| **实验总结和反思** |