EEEN203 Lab 6

Experimental Procedure

Expected Gain

Measured voltage source

Oscilloscope measurements for

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| In Amp | f |  |  | Gain | Gain | Period, T |  | Phase delay |
| mV | [Hz] | [V] | [V] |  | [dB] | [s] | [s] | [degrees] |
| 250 | 10 | 0.168 | 1.72 | 10.23809 | 20.2044 | 0.1 |  | -3.62 |
| 300 | 20 | 0.216 | 2.24 | 10.3703 | 20.3159 | 0.5 |  | -1.44 |
| 500 | 50 | 0.256 | 2.88 | 11.25 | 21.0231 | 0.2 |  | -1.08 |
| 500 | 100 | 0.256 | 2.88 | 11.25 | 21.0231 | 0.01 |  | 0.720 |
| 500 | 200 | 0.272 | 2.88 | 10.5882 | 20.4965 | 0.05 |  | -1.44 |
| 500 | 500 | 0.272 | 2.88 | 10.5882 | 20.4965 | 0.02 |  | -2.70 |
| 500 | 1 k | 0.272 | 2.88 | 10.5882 | 20.4965 | 0.001 |  | -1.26 |
| 500 | 2 k | 0.272 | 2.96 | 10.5882 | 20.4965 | 0.005 |  | -1.83 |
| 500 | 5 k | 0.288 | 2.96 | 10.2233 | 20.2380 | 0.002 |  | -3.94 |
|  | 100k |  |  |  |  |  |  |  |
|  | 200k |  |  |  |  |  |  |  |
|  | 500k |  |  |  |  |  |  |  |
| 1100 | 1 M | 0.6 | 0.134 | 0.2233 | -13.0209 | 0.000001 |  | -100 |

Frequency Response Graph for

Chart, line chart

Description automatically generated

Oscilloscope measurements for

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| In Amp | f |  |  | Gain | Gain | Period, T |  | Phase delay |
| mV | [Hz] | [V] | [V] |  | [dB] | [s] | [s] | [degrees] |
| 500 | 10 | 0.272 | 12.7 | 46.6912 | 33.3847 | 0.1 |  | -2.52 |
| 500 | 20 | 0.27 | 11.4 | 42.2222 | 32.5108 | 0.05 |  | -0.36 |
| 500 | 50 | 0.274 | 11.2 | 40.8759 | 32.2293 | 0.02 |  | -1.86 |
| 500 | 100 | 0.272 | 11 | 40.4412 | 32.1365 | 0.01 |  | -0.960 |
| 500 | 200 | 0.278 | 11 | 40.4412 | 31.9470 | 0.005 |  | -2.88 |
| 500 | 500 | 0.276 | 11 | 39.5683 | 32.0097 | 0.002 |  | -8.86 |
| 1000 | 1 k | 0.503 | 11 | 21.8683 | 26.7965 |  |  | -9.61 |
| 1000 | 2 k | 0.503 | 11.1 | 22.06759 | 26.8751 |  |  | -17 |
| 1000 | 5 k | 0.503 | 11.1 | 22.06759 | 26.8751 |  |  | -41.0 |
| 1000 | 100k | 0.503 | 1.15 | 2.2863 | 7.1826 |  |  | -86.9 |
| 1000 | 200k | 0.503 | 0.509 | 1.0119 | 0.1030 |  |  | -84.2 |
| 1000 | 500k | 0.503 | 0.240 | 0.4771 | -6.4271 |  |  | -92.9 |
| 1000 | 1 M | 0.505 | 0.122 | 0.2415 | -12.3386 |  |  | -103? |

Frequency response graphs for

Chart, line chart

Description automatically generated

Misc: photos of the output of the Op amp:

* Getting cut of at the top as the gain exceeds the maximum voltage from the inputs
* Becoming sharper due to the slew rate being exceeded
* Gain reducing as the frequency goes past cutoff

Graphical user interface, chart

Description automatically generatedChart

Description automatically generated

A picture containing graphical user interface

Description automatically generatedA picture containing text, electronics, display

Description automatically generated

Graphical user interface, chart

Description automatically generated