Laboratory #3 Report

Class:

Name: Student ID:

1. Exploration 1
   1. Voltage measurements of pin 1, 2, 3, 4, 11

Table 3.3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pin | | | Measured value | | |
| 11 | | |  | | |
| 4 | | |  | | |
| 1 | 2 | 3 |  |  |  |

* 1. Voltage gain measurements of the inverting OPAMP

Table 3.4

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) | f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) |
| 100 |  |  |  | 20k |  |  |  |
| 500 |  |  |  | 50k |  |  |  |
| 1k |  |  |  | 100k |  |  |  |
| 5k |  |  |  | 200k |  |  |  |
| 10k |  |  |  | 500k |  |  |  |

1. Exploration 2
2. Voltage measurements of pin 1, 2, 3, 4, 11

Table 3.5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pin | | | Measured value | | |
| 11 | | |  | | |
| 4 | | |  | | |
| 1 | 2 | 3 |  |  |  |

1. Voltage gain measurements of the non-inverting OPAMP

Table 3.6

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) | f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) |
| 100 |  |  |  | 20k |  |  |  |
| 500 |  |  |  | 50k |  |  |  |
| 1k |  |  |  | 100k |  |  |  |
| 5k |  |  |  | 200k |  |  |  |
| 10k |  |  |  | 500k |  |  |  |

1. Exploration 3
2. Voltage measurements of pin 1, 2, 3, 4, 11

Table 3.7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pin | | | Measured value | | |
| 11 | | |  | | |
| 4 | | |  | | |
| 1 | 2 | 3 |  |  |  |

(2) Vi and VO graph with square wave input

(3) Voltage gain measurements of the OPAMP inverting integrator

Table 3.8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) | f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) |
| 100 |  |  |  | 600 |  |  |  |
| 200 |  |  |  | 700 |  |  |  |
| 300 |  |  |  | 800 |  |  |  |
| 400 |  |  |  | 900 |  |  |  |
| 500 |  |  |  | 1000 |  |  |  |

1. Exploration 4
2. Voltage measurements of pin 1, 2, 3, 4, 11

Table 3.9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pin | | | Measured value | | |
| 11 | | |  | | |
| 4 | | |  | | |
| 1 | 2 | 3 |  |  |  |

(2) Vi and VO graph with ramp wave input

(3) Voltage gain measurements of the OPAMP differentiator

Table 3.10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) | f  (Hz) | Vi(p-p)  (V) | Vo(p-p)  (V) | AV  (dB) |
| 1k |  |  |  | 6k |  |  |  |
| 2k |  |  |  | 7k |  |  |  |
| 3k |  |  |  | 8k |  |  |  |
| 4k |  |  |  | 9k |  |  |  |
| 5k |  |  |  | 10k |  |  |  |

1. Problem 1

What’s the importance of CMRR in the amplifier circuits?

1. Problem 2

Use MATLAB or Excel to plot the frequency vs. gain figures according to your measurement and explain the results.

1. Problem 3

The applied small signal input in exploration 1 and 2 is 200mVpp. Is it possible to apply a 3 Vpp signal? Why?

1. Conclusion