**Pre-Lab 3:**

**Second Order Circuit**

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ECEN 325 Section 514

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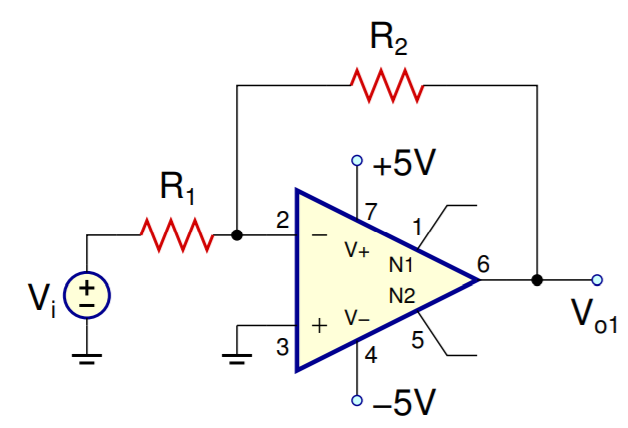
**Calculation**

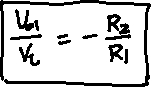
1. Read the data sheet for the UA741 opamp and write down the typical values of the following parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| Supply Voltage: | 5V to 15V  -5V to -15V | Power Consumption: | 50mW |
| Input Resistance: | 2MΩ | Input Offset Voltage: | 1mV |
| Output Resistance: | 75Ω | Input Offset Current: | 20nA |
| Voltage Gain: | 106dB | Bandwidth: | 1MHz |
| Slew Rate: | 0.5V/μs |  |  |

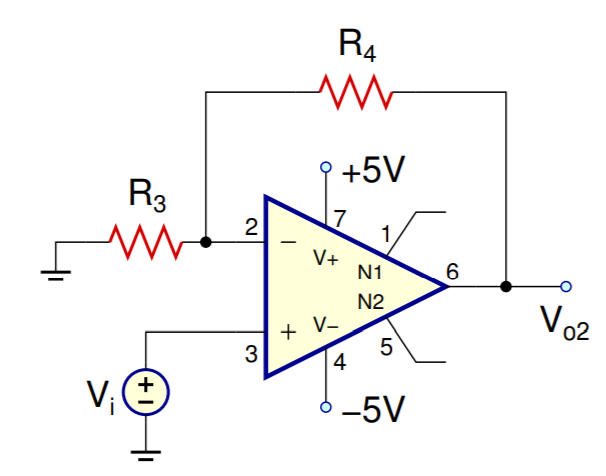
1. Derive the voltage gains

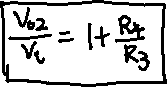
Circuit A



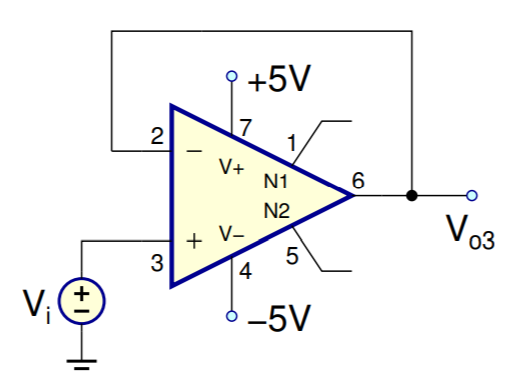


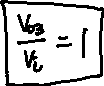
Circuit B



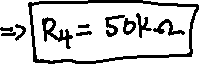


Circuit C



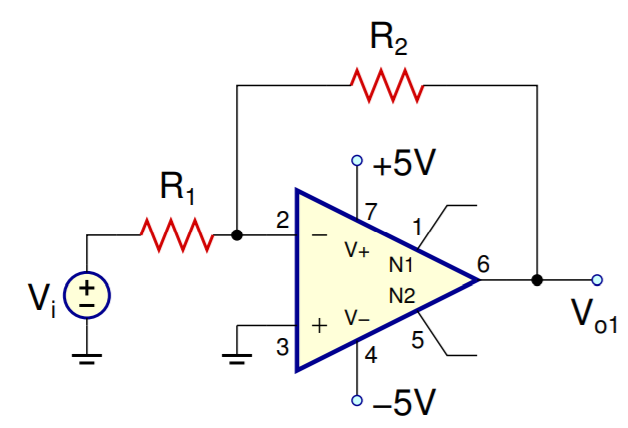


1. If R1 = R3 = 10kΩ, find R2 and R4 such that Vo1/Vi =−3 and Vo2/Vi = 6.

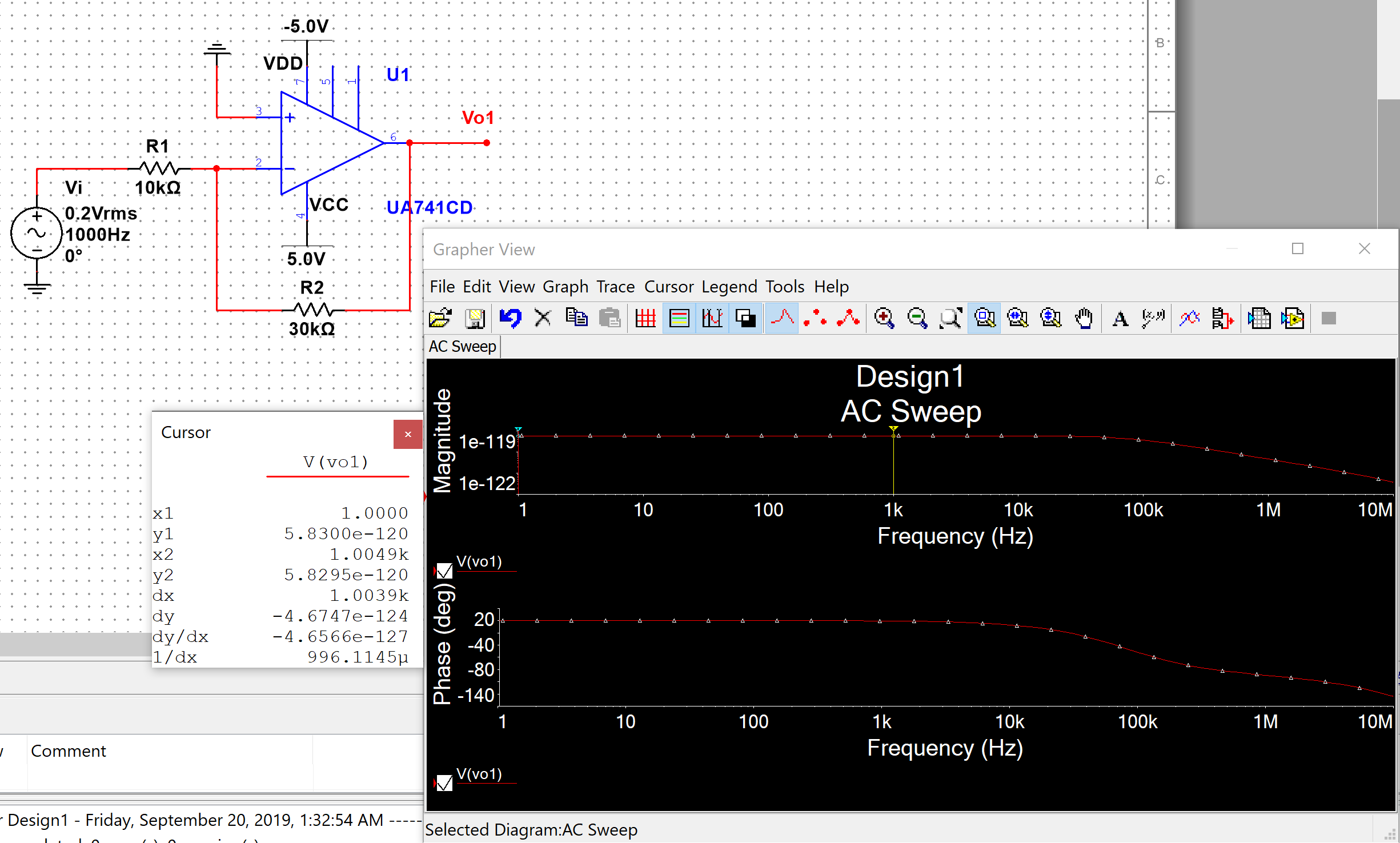


**Simulations**

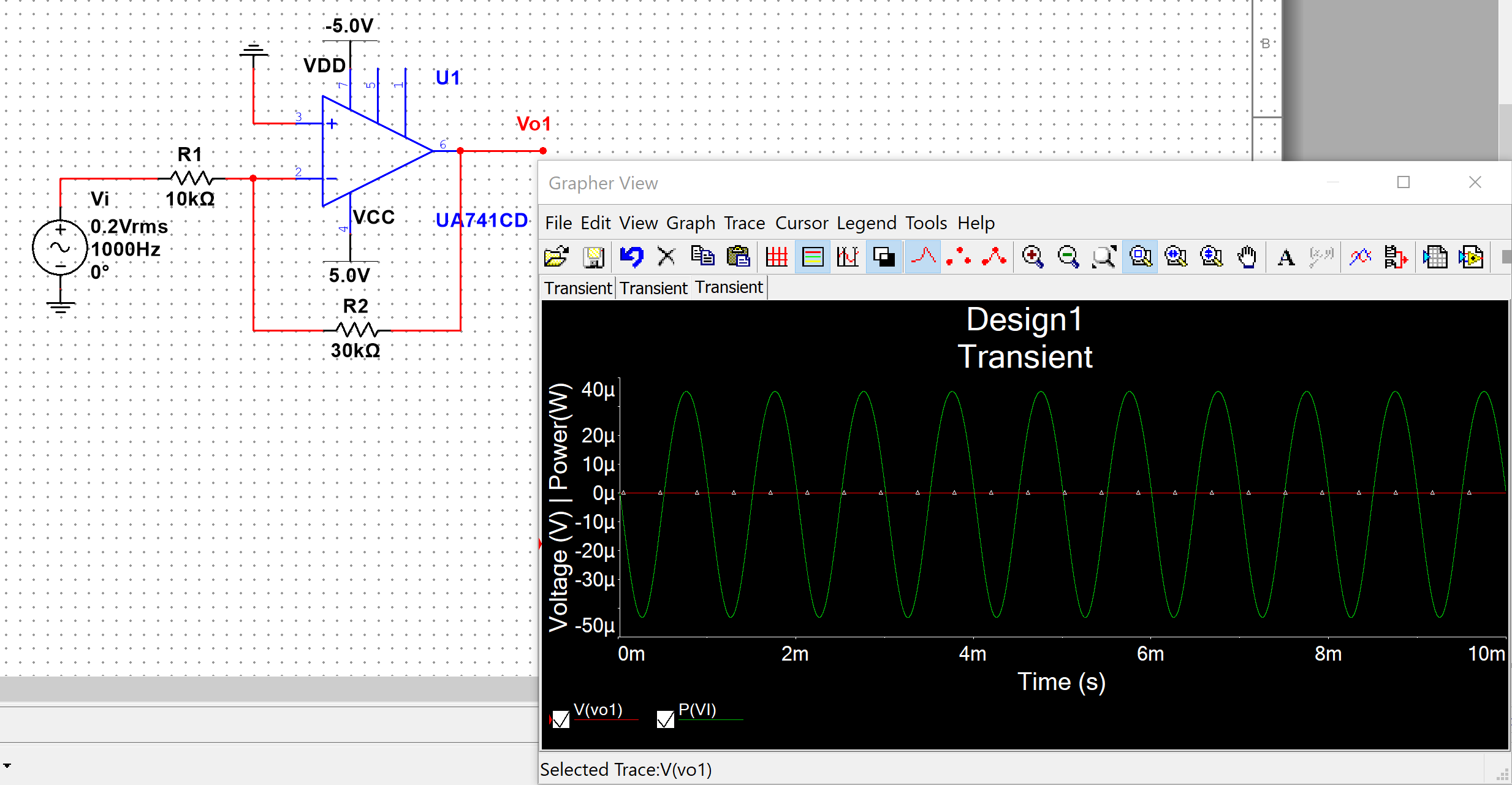
Circuit A



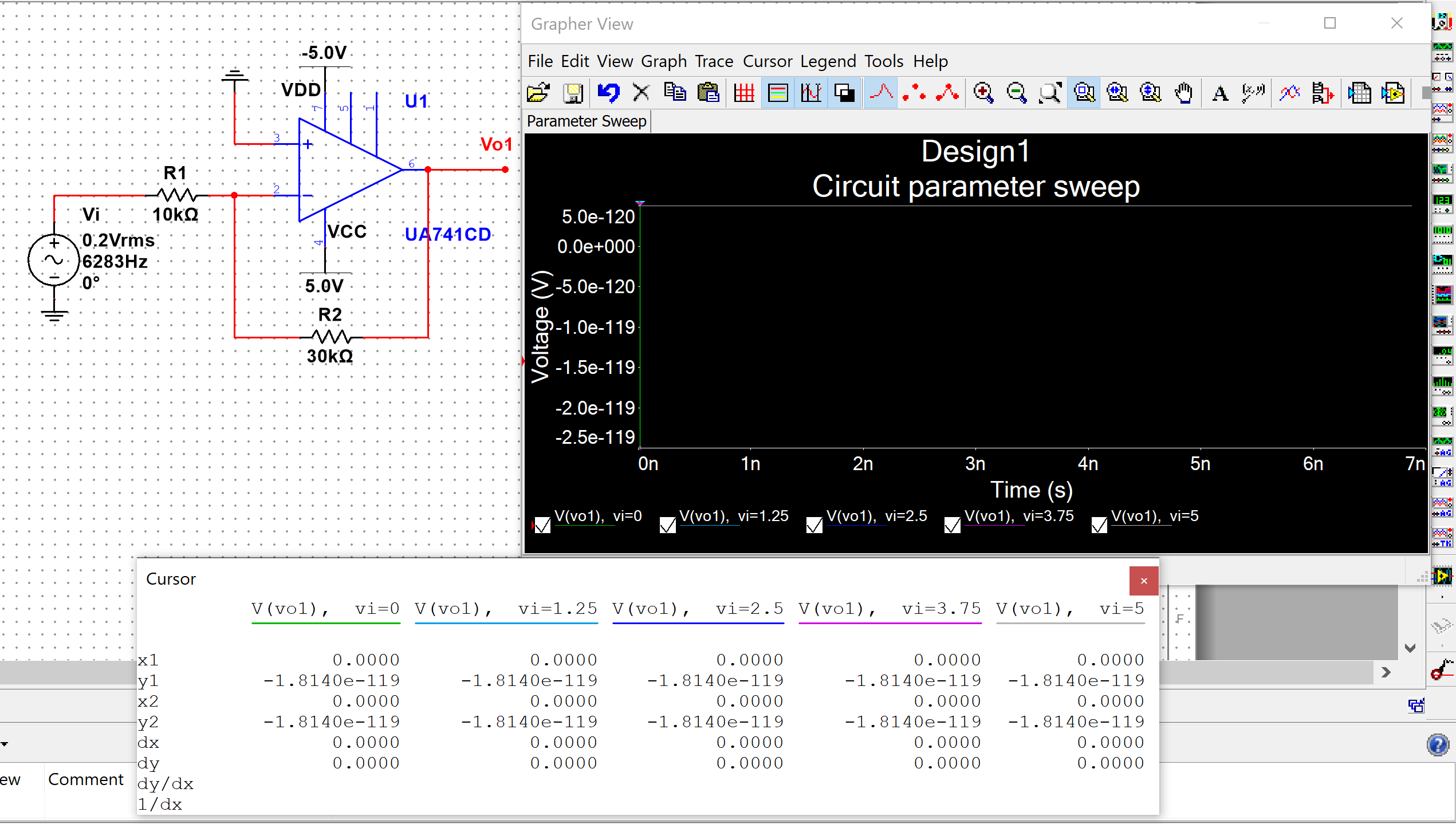




(b)

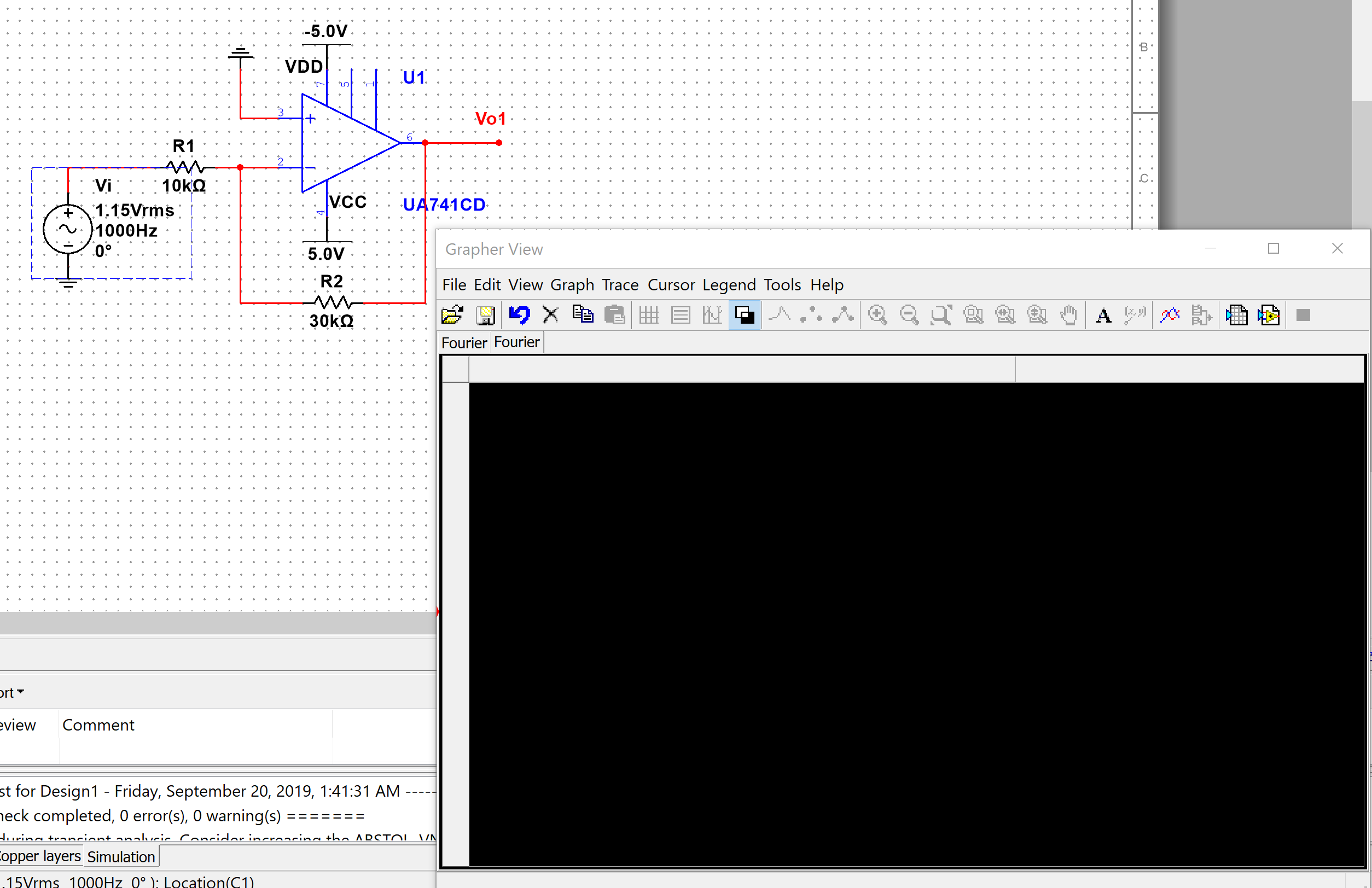


(c)



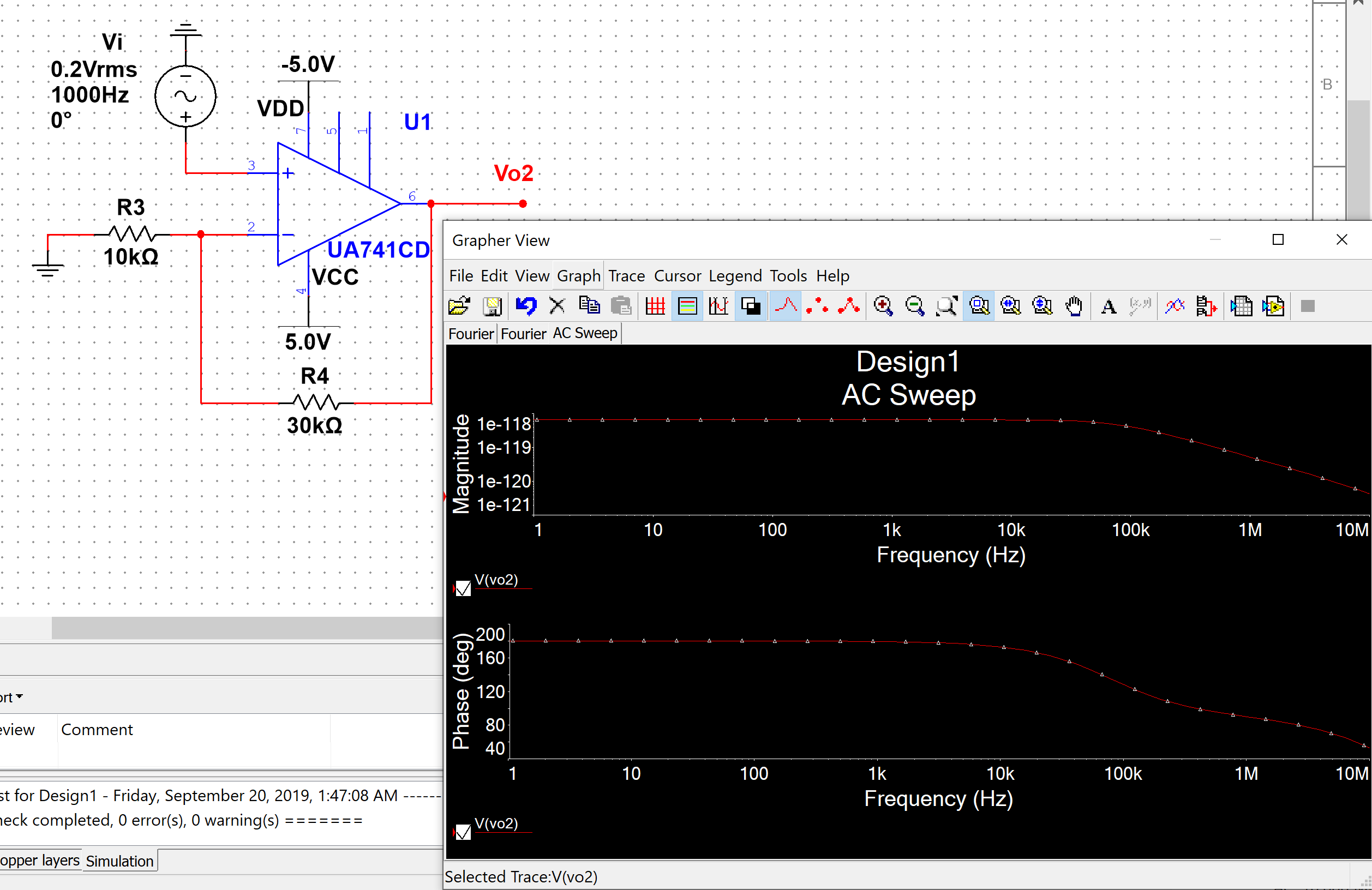
(d)

Since I couldn’t tell the Vmax from the graph above. I searched online and used 1.15V as the Vmax for this circuit. Still couldn’t figure out why there is nothing on the graph.

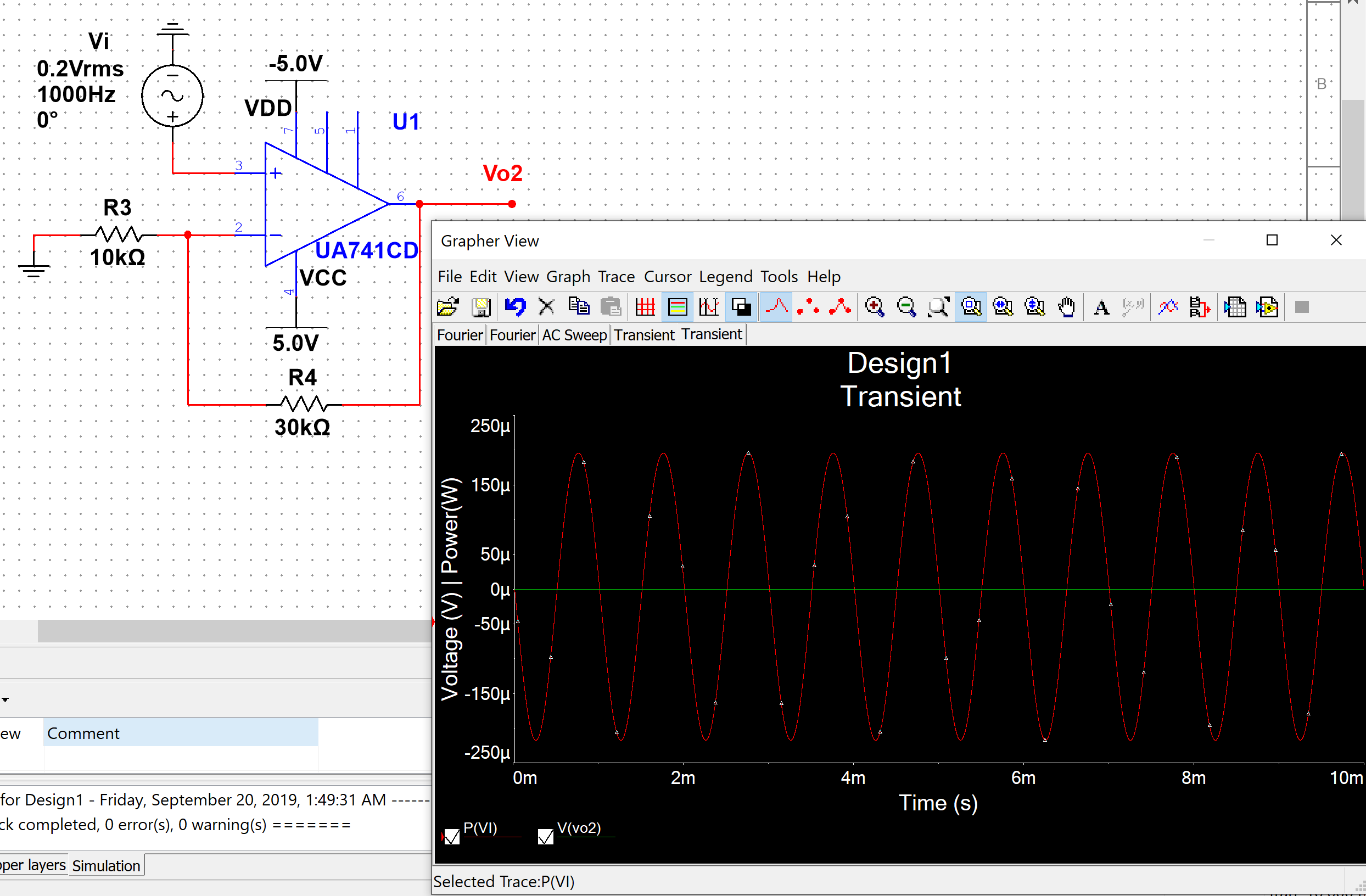


Circuit B

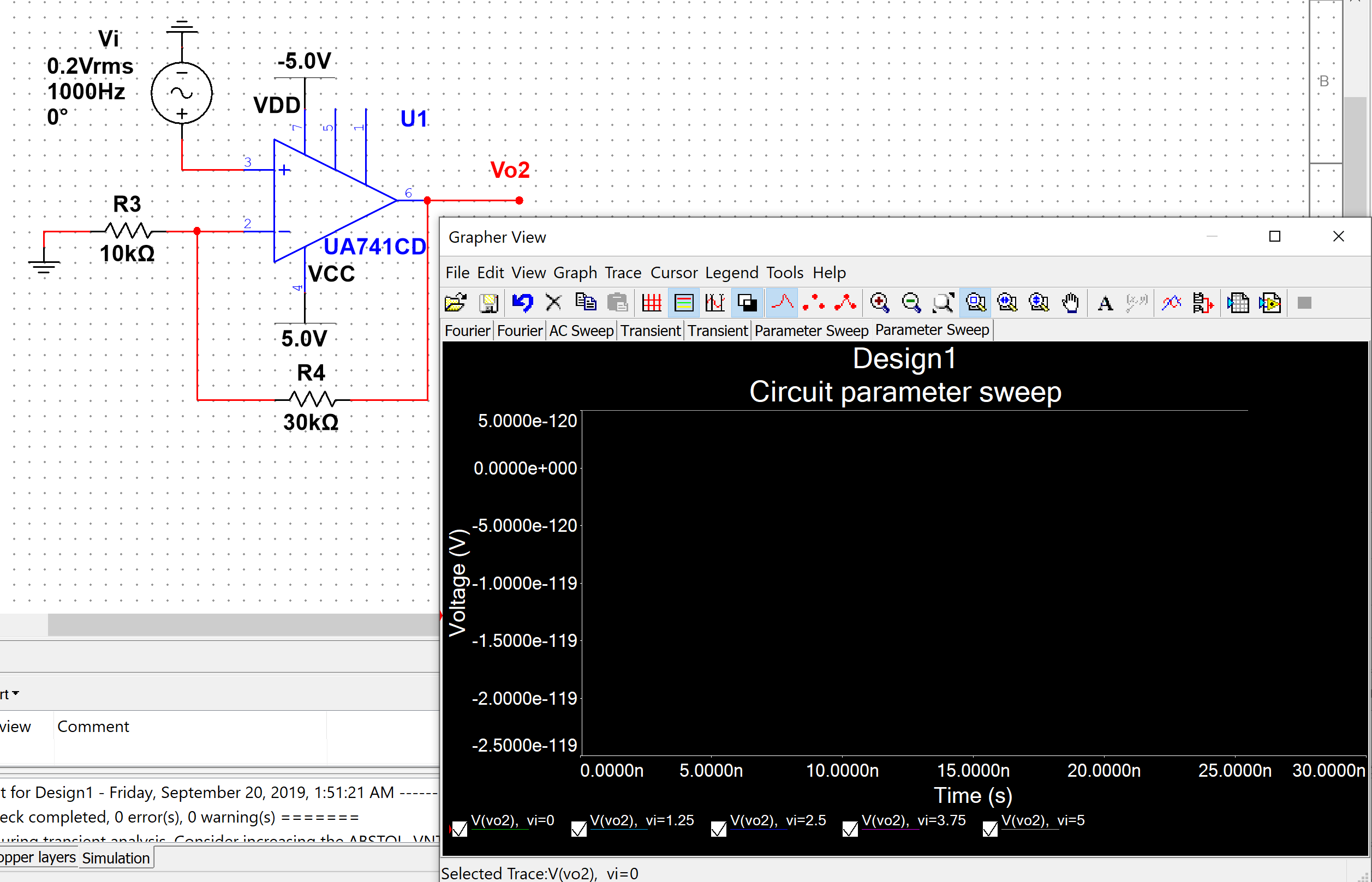
(a)



(b)

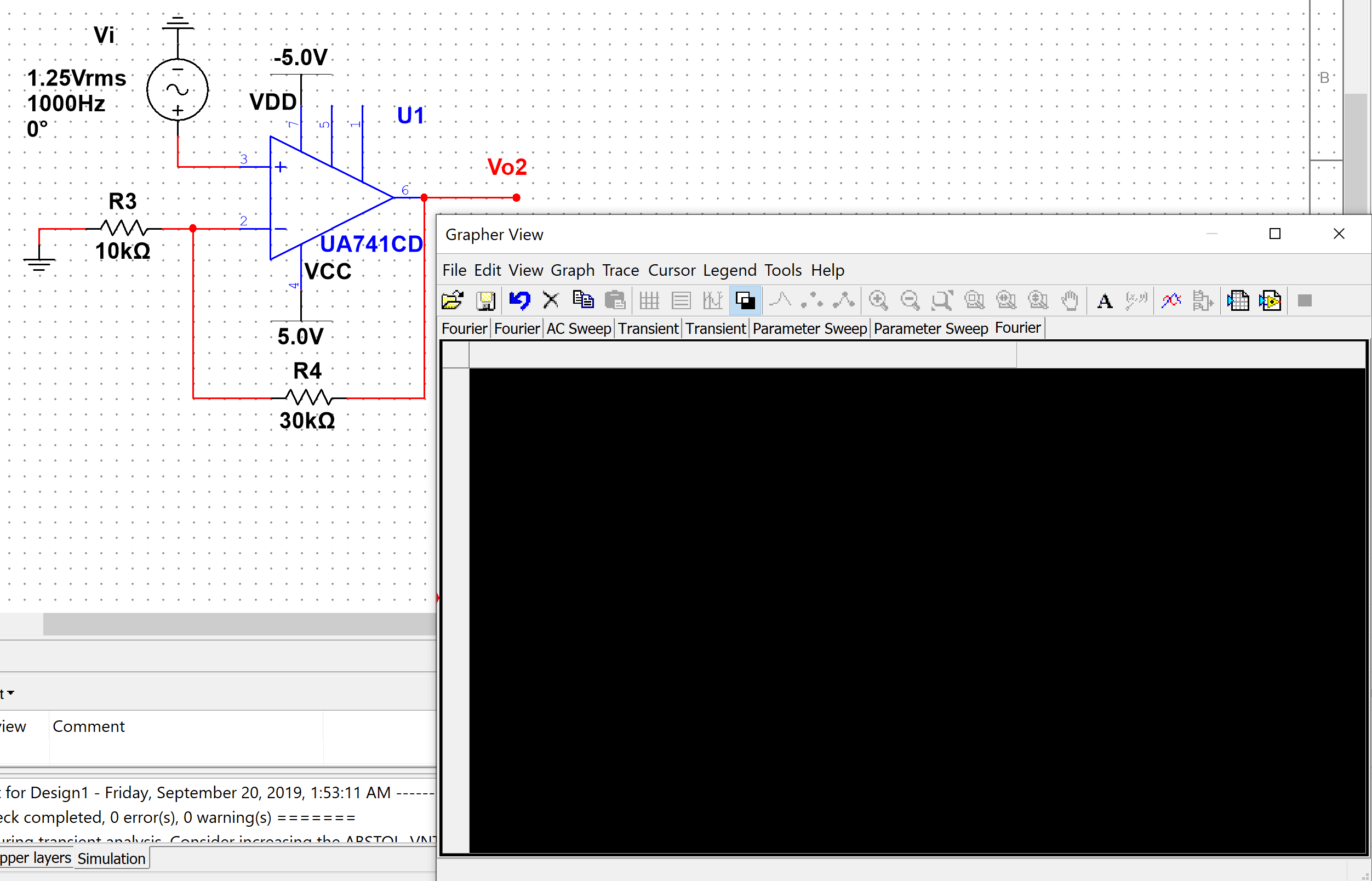


(c)



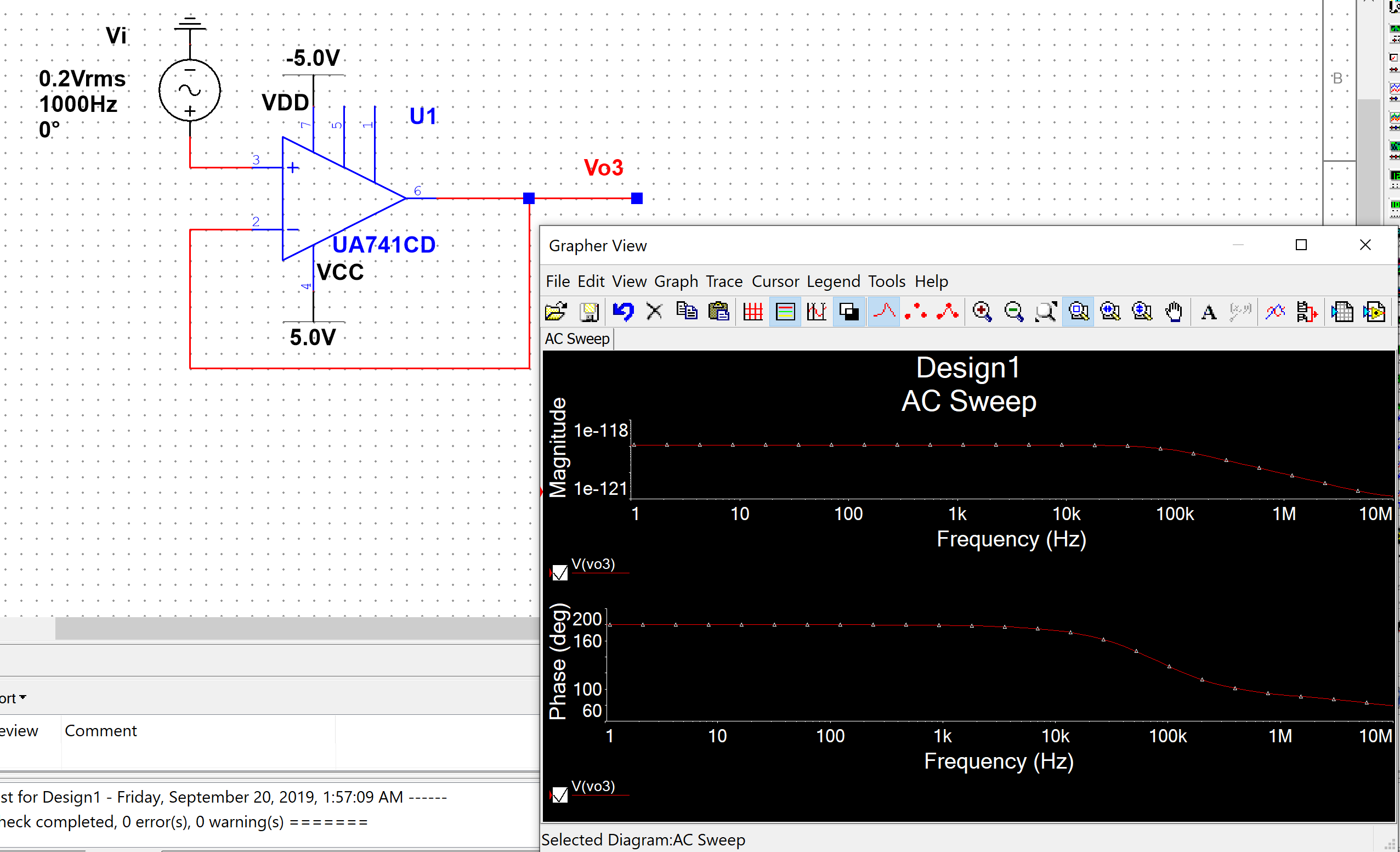
(d)

Since I couldn’t tell the Vmax from the graph above. I searched online and used 1.25V as the Vmax for this circuit. Still couldn’t figure out why there is nothing on the graph.

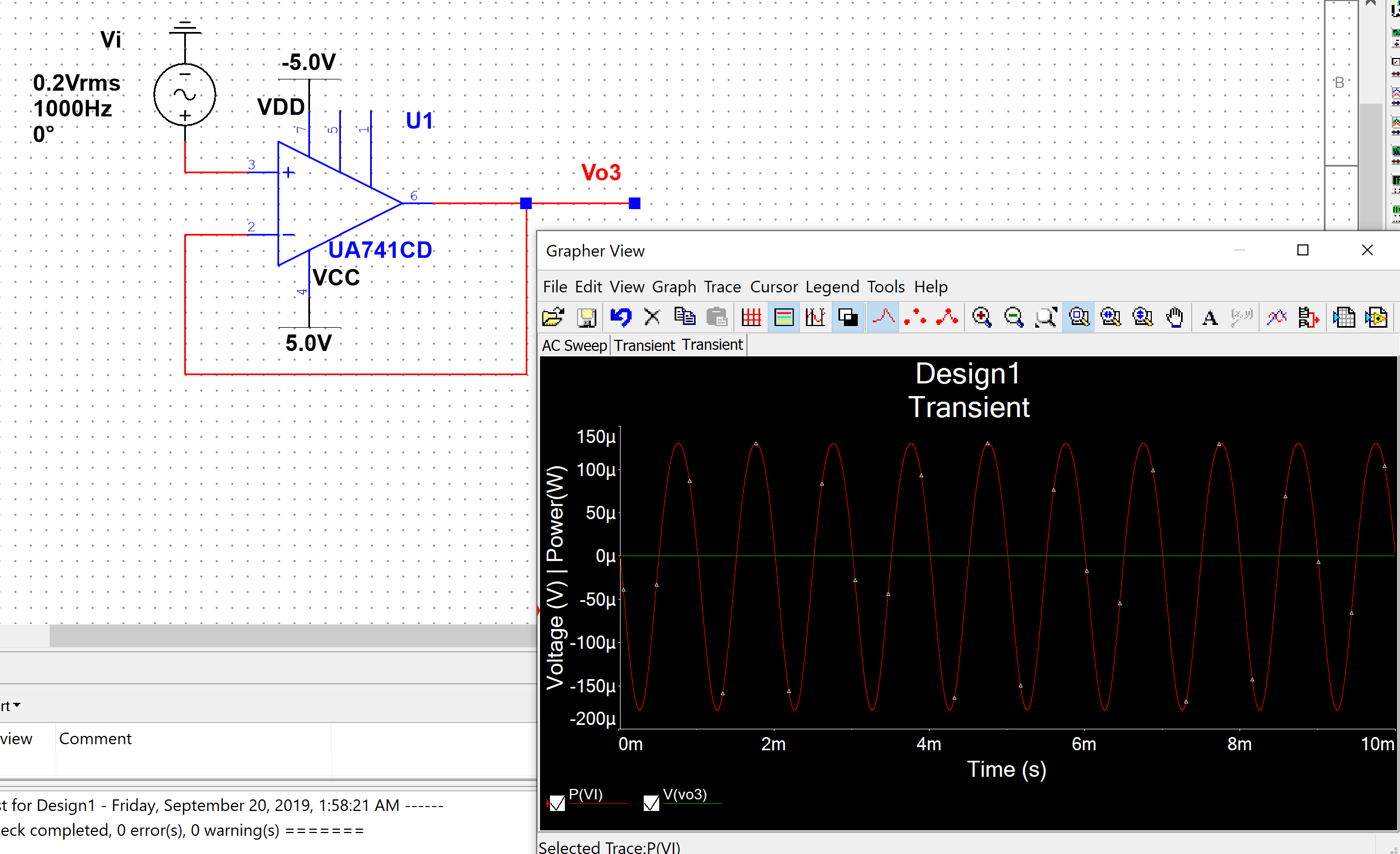


Circuit C

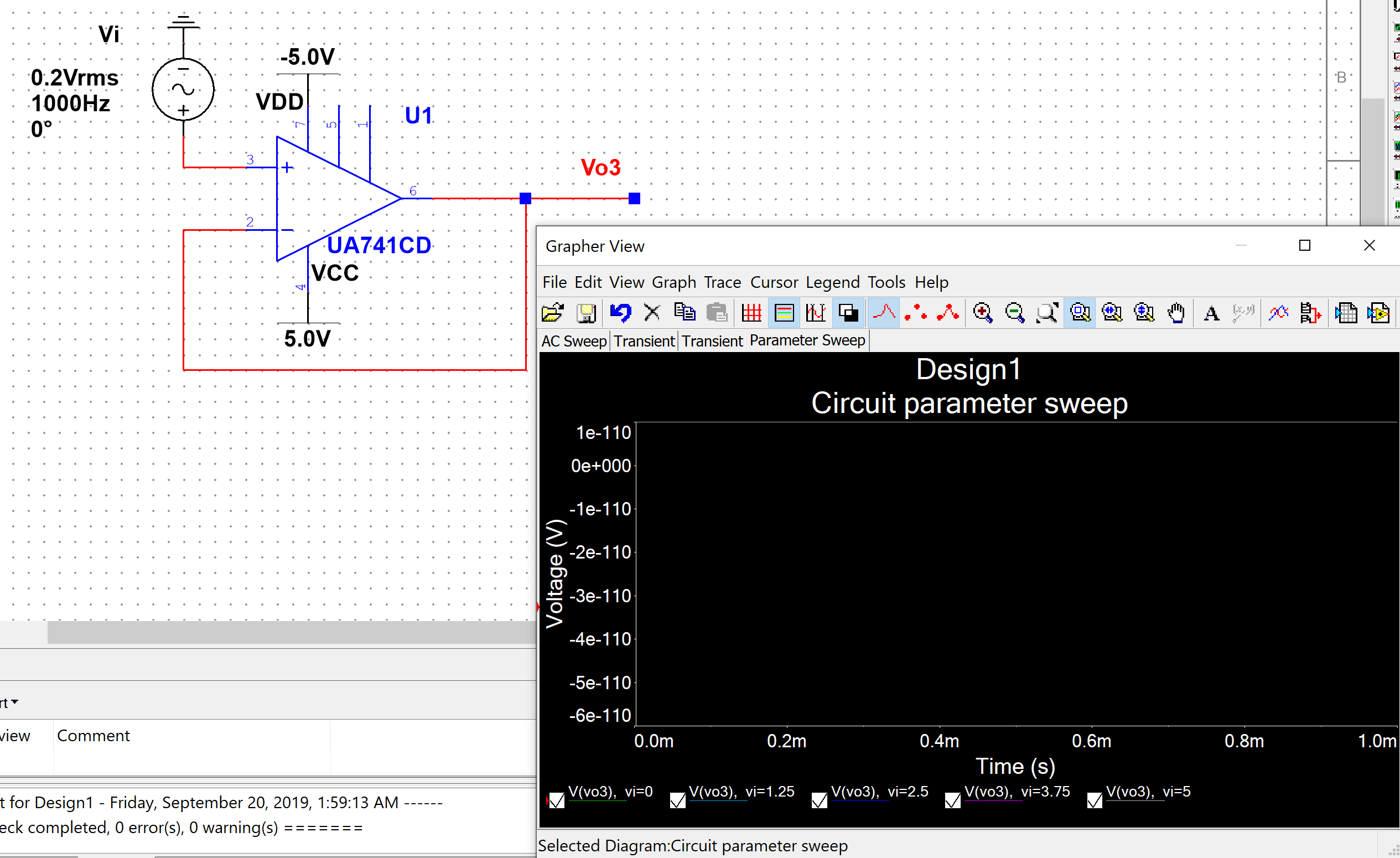
(a)



(b)



(c)



(d)

Since I couldn’t tell the Vmax from the graph above. I searched online and used 1V as the Vmax for this circuit. Still couldn’t figure out why there is nothing on the graph.

