2Ei5
Lab#4

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Lab section: L01
Date: Feb. 20 th 2021

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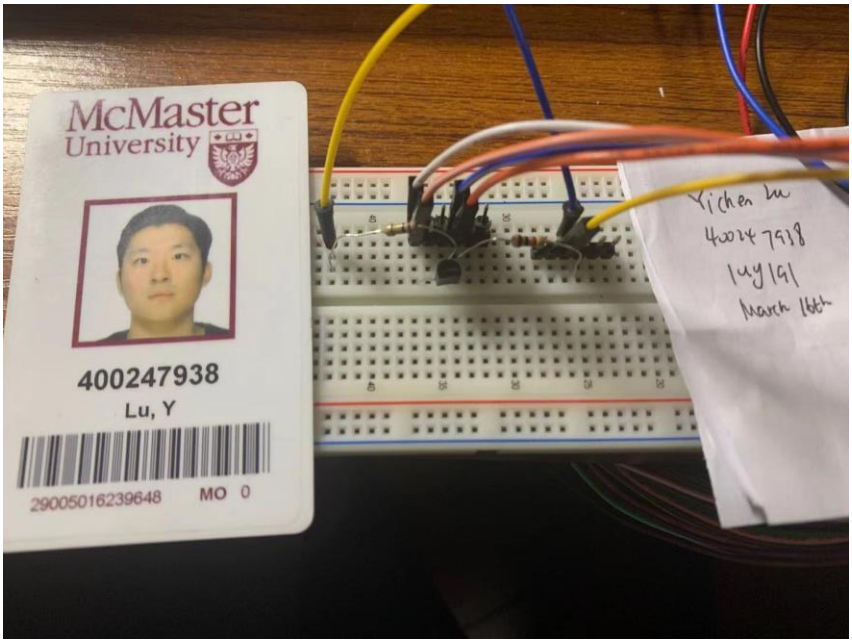
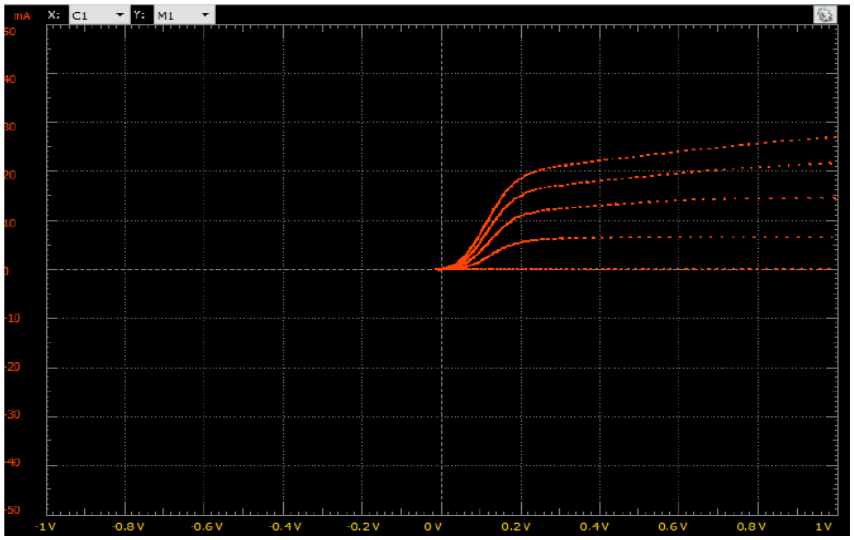
Submitted by Yichen Lu,luy191,400247938

Task1

Physical circuit

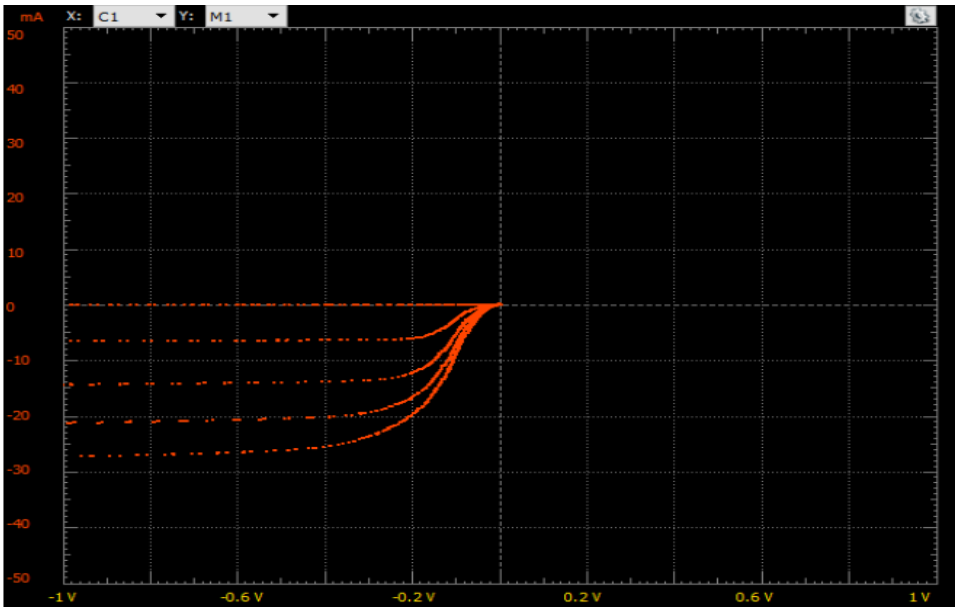


NPN output characteristic

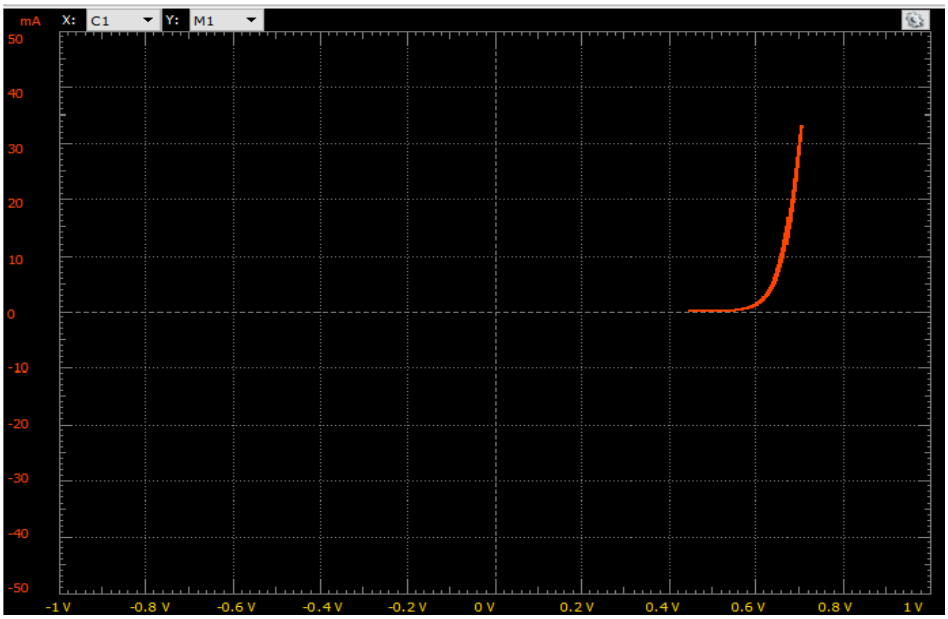


As we can see, VCE (sat) should be 0.2 V from this graph.

PNP output characteristic

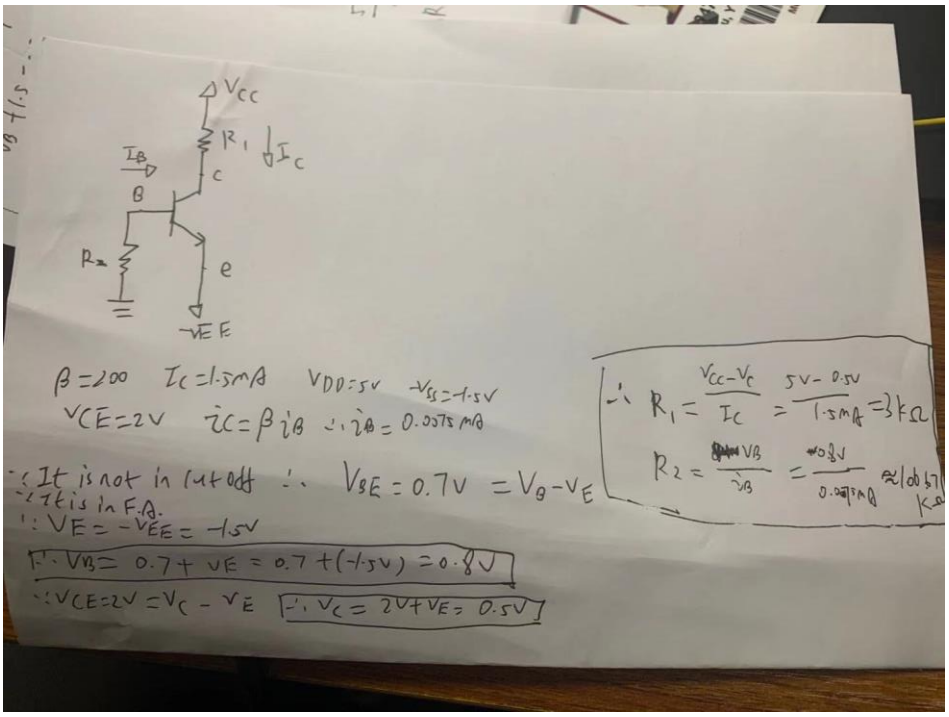


Task2



As we can see, VBE (on) should be 0.7v from the graph.
β should be 100 by estimating.

Task3



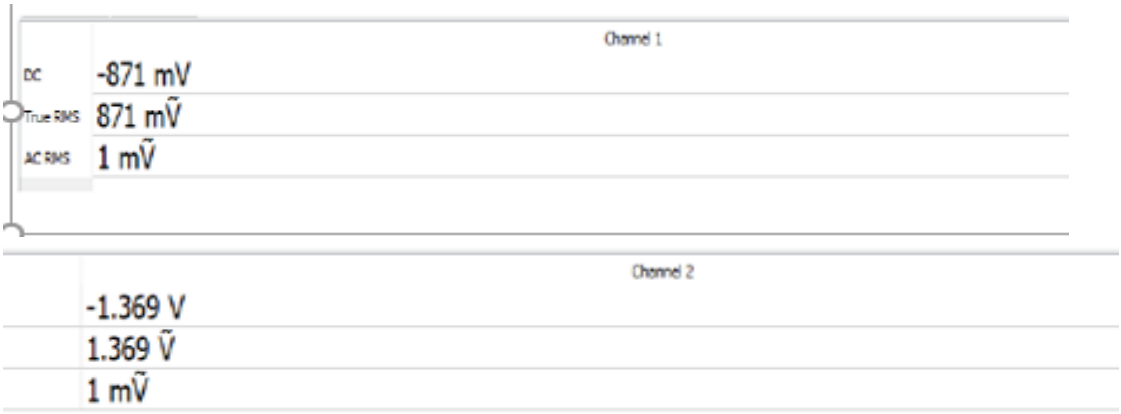
R1 is 3Kohm and R2 is 100Kohms.

2N3094

	Channel 1
DC	836 mV
True RMS	836 mV̄
AC RMS	0 V̄

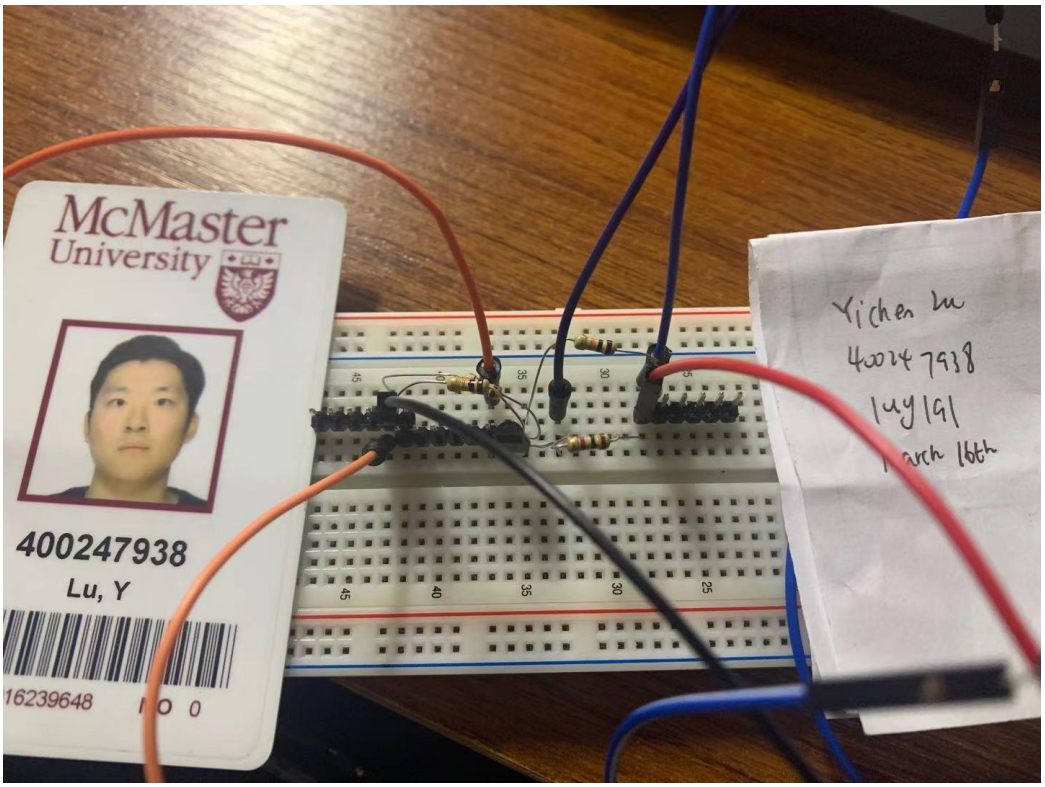
IC is around 2.1mA, and IB is around 8.3e-23A. β calculated is 254.

2N2222



The result is similar with the above one. IC is about 2.1mA, and IB is about 8.71e-3mA. β calculated is 244.

Task4



2N3094

	Channel 1
DC	-84 mV
True RMS	84 mṼ
AC RMS	2 mṼ

Channel 2
754 mV
754 mṼ
1 mṼ

IB is calculated 0.0167mA. IC is 4.28mA. β calculated is around 252.

2N2222

	Channel 1
DC	-85 mV
True RMS	85 mṼ
AC RMS	1 mṼ

Channel 2
764 mV
764 mṼ
1 mṼ

IB is calculated 0.0169mA. IC is 4.23mA. β calculated is around 249.