Exercise E6

Channel	Name	Span	Value	Min.	Max.	x☐	σ
A	Maximum	Whole trace	788.6 mV	785.9 mV	788.6 mV	787.4 mV	1.364 mV
A	Minimum	Whole trace	766.3 mV	763.4 mV	766.3 mV	765.8 mV	1.045 mV
B	Maximum	Whole trace	5.06 V	5.06 V	5.06 V	5.06 V	0 V
B	Minimum	Whole trace	5.021 V	5.01 V	5.021 V	5.015 V	4.225 mV

Pico Technology   www.picotech.com   PicoScope 7 T&M   Version 7.1.13.17054   JO243/2882 PS2204A

31/12/2023 12:58:27
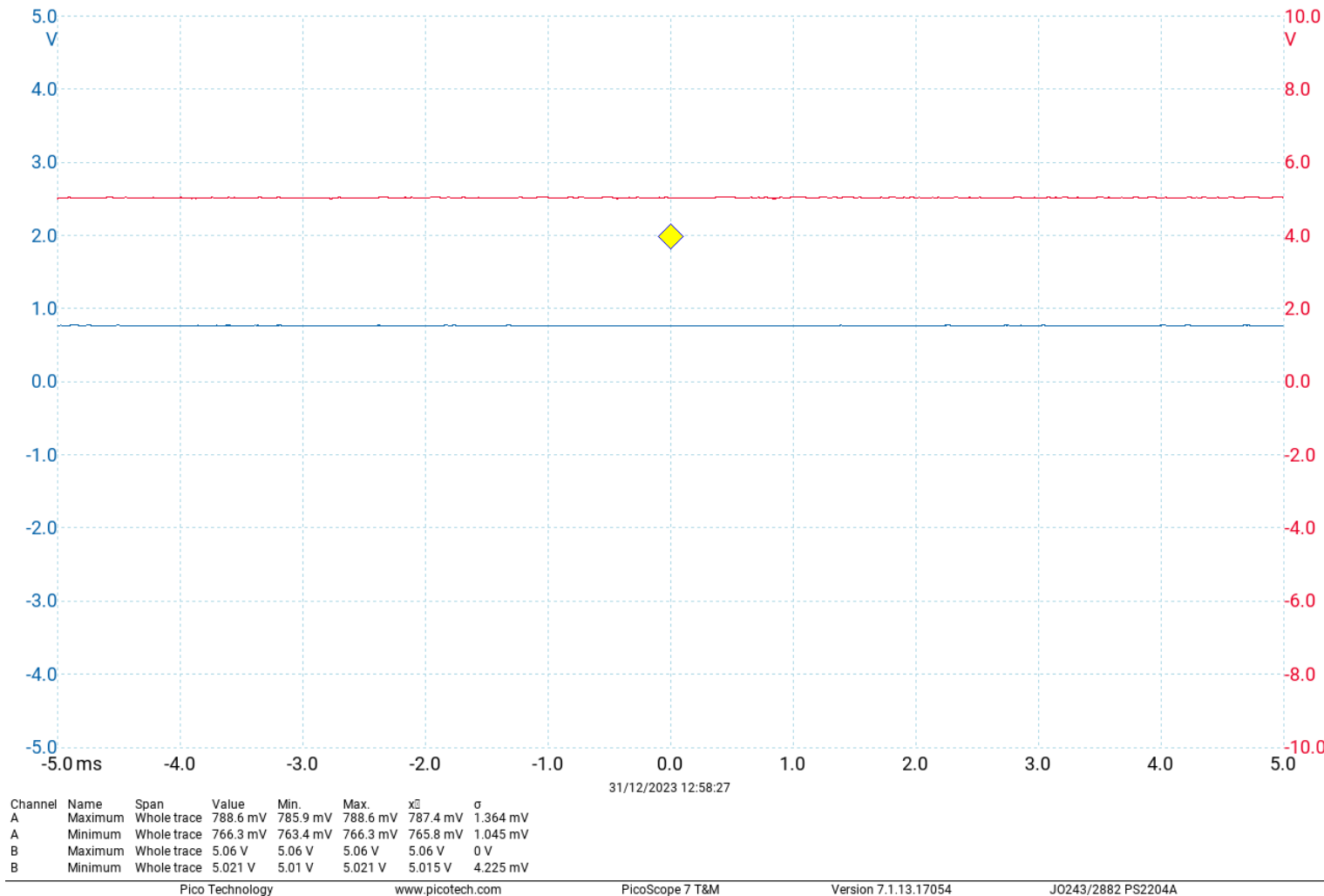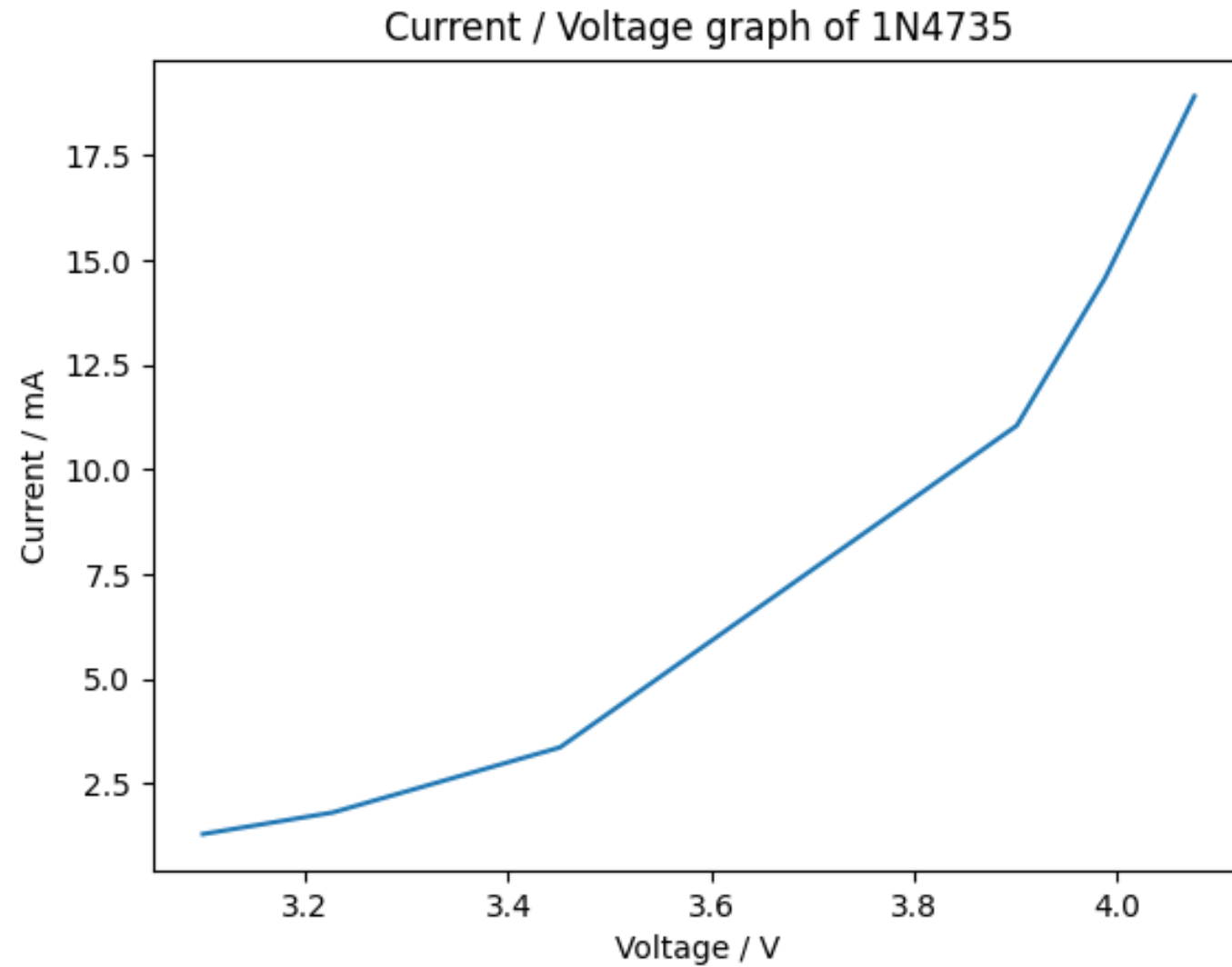
- Datasheets: breakdown voltage is 6.2V

- A: $V_{fd} = 777mV$

- B: $V_{USB} = 5.037V$

- $I = \dfrac{V_{USB} - V_{fd}}{R_0} = 9.064mA$

- These values are within expectations.

Exercise E6

| R_0/Ω	V_{USB}/V	V_{fd}/V	I/mA
1500	5.045	3.099	1.297
1000	5.040	3.227	1.813
470	5.034	3.451	3.368
100	5.006	3.901	11.050
68	4.979	3.988	14.574
47	4.965	4.076	18.915

Exercise E6

Current / Voltage graph of 1N4735

Exercise E6

- There doesn't seem to be a way to compare the experimental results with the specifications, which claims that when $I_{ZT} = 41mA, V_Z = 6.2V$. (See: https://www.futurlec.com/Diodes/1N4735.shtml)

- There are also no models of 1N4735 available in LTSpice. Comparations with the 1N750 model cannot be directly made, but the simulation of 1N750 in LTSpice can be plotted as follows:

Exercise E6

1N750 (LTSpice)
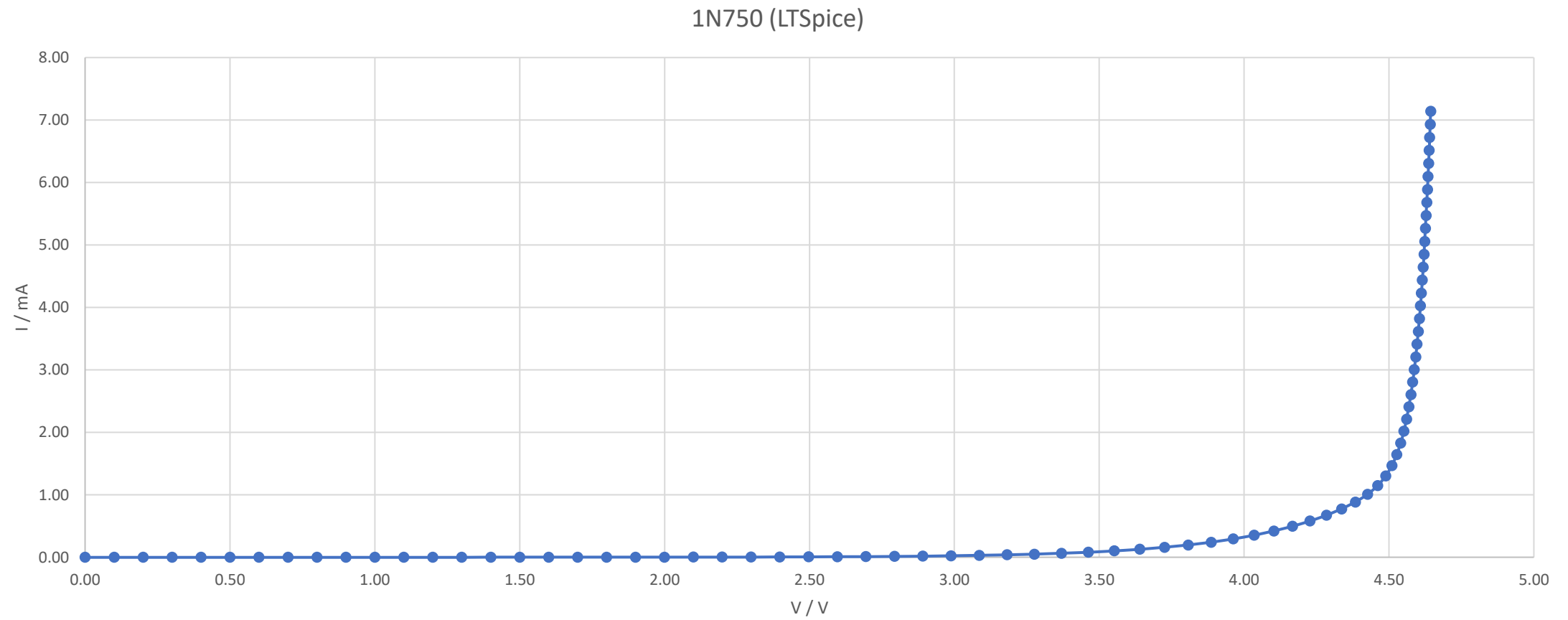
Exercise E6

- Although not very obvious, we may notice a similar trend of increasing slope in both plots.

1N750 (LTSpice)

Current / Voltage graph of 1N4735