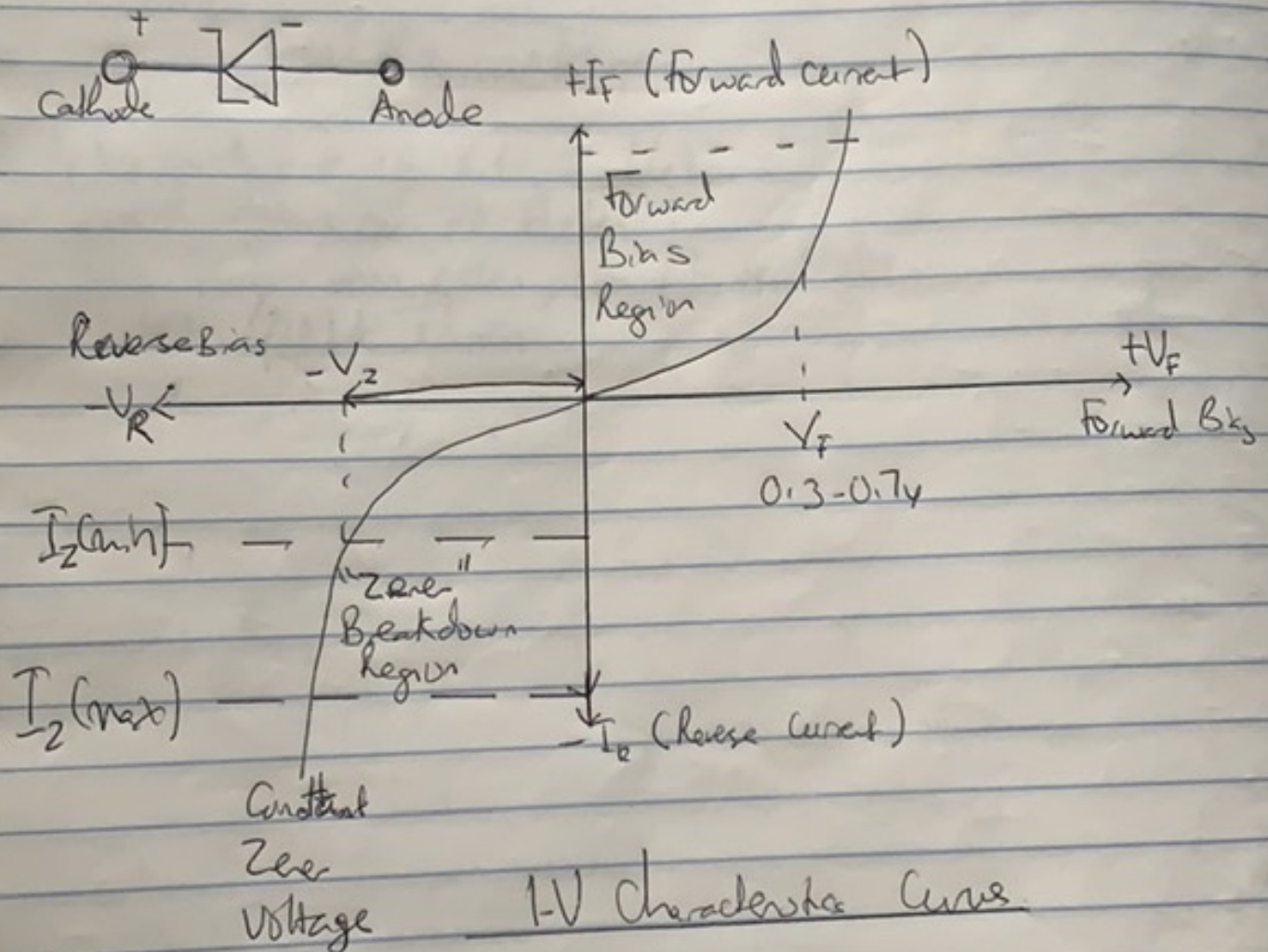
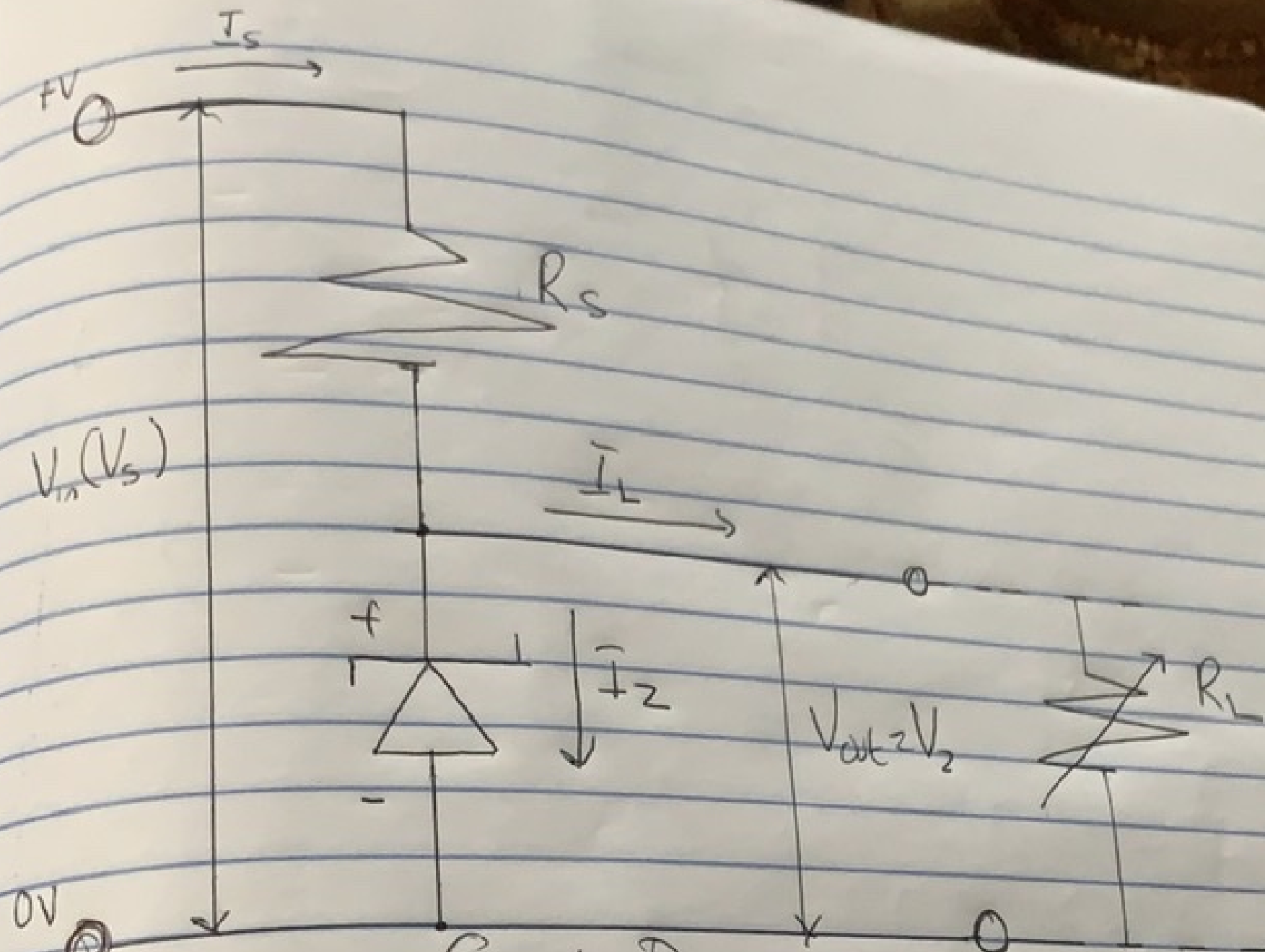


A Zener diode or "Breakdown diode" is basically a standard P-N junction diode specifically designed to have a low P.C. - determined Reverse Breakdown Voltage that takes advantage of this high reverse voltage. It is the simplest type of voltage regulator. When forward biased it behaves like a normal signal diode but when reverse voltage is applied across it it exceeds the rated voltage of the device.





Circuit Diagram

$P = 5W$
 $I = 50 \times 10^{-3} A$

Convert to VDC
 $V_{DC} = \frac{2V_{rms}}{\pi}$

$V_s = \frac{2 \times 10}{\pi} = 12.73 V_{DC}$

Recall that $P = IV$

$V_2 = \frac{P}{I} = \frac{5}{50 \times 10^{-3}}$

$V_2 = 10V$

Recall that $V_2 + V_R = V_s$

$V_R = V_s - V_2$

$12.73 - 10$

$= 2.73V$

$V_R = IR$

$R = \frac{V}{I} = \frac{2.73}{50 \times 10^{-3}} = 5.46$

$I_s = I_2 + I_L$

$I_2 = I_s - I_L$

$I_L = \frac{V_2}{R} = \frac{10}{500} = 0.02 A = 20mA$

$I_2 = 50mA - 20mA$

$= 30mA = 0.03A$