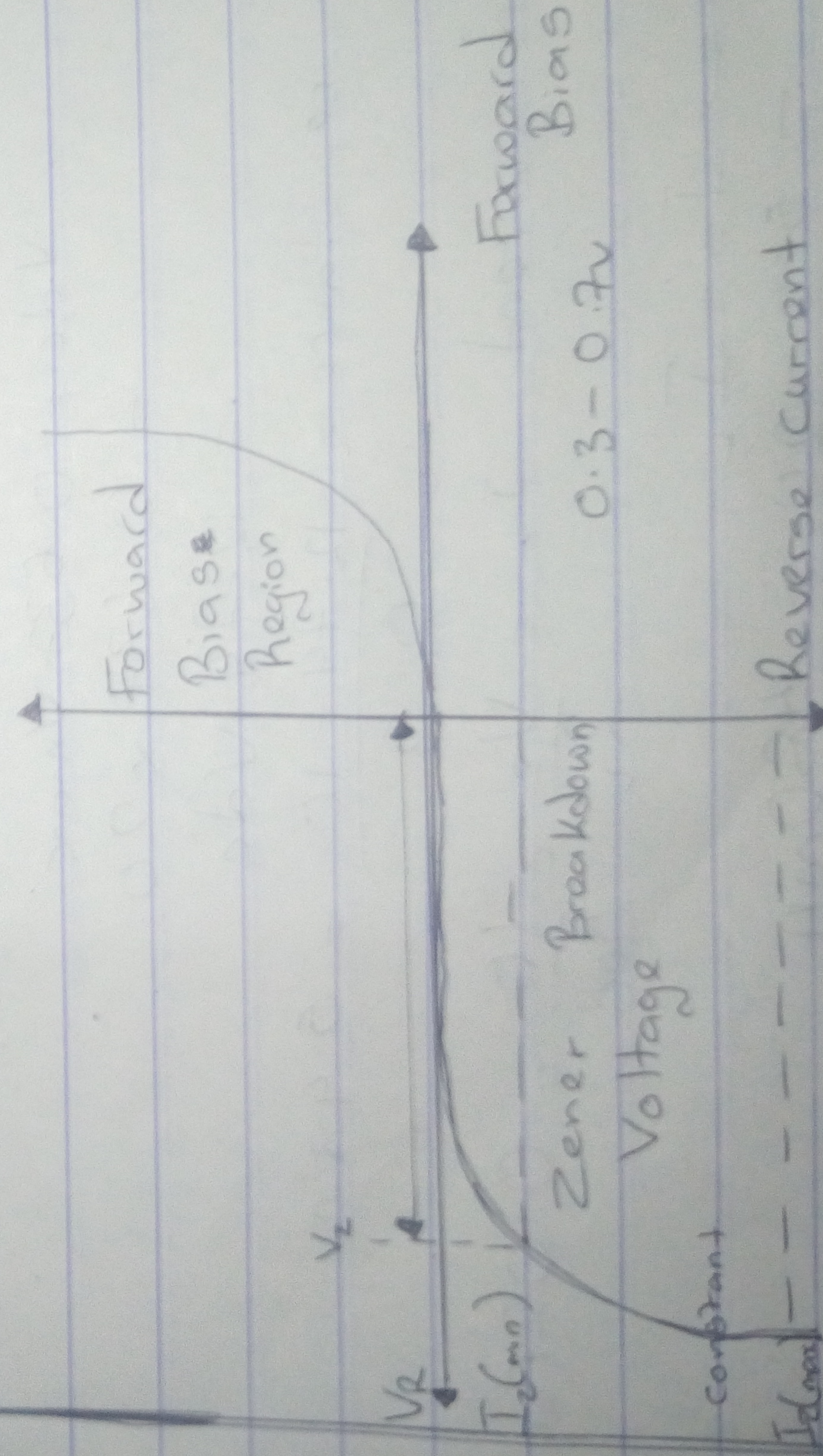
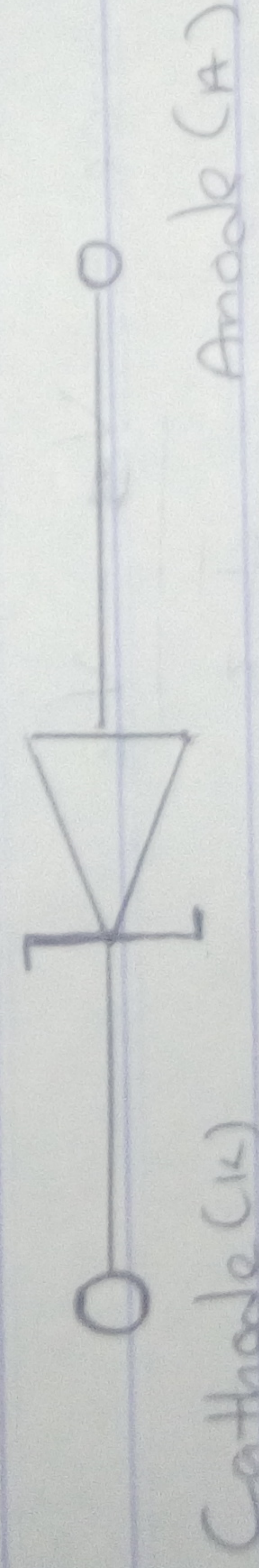


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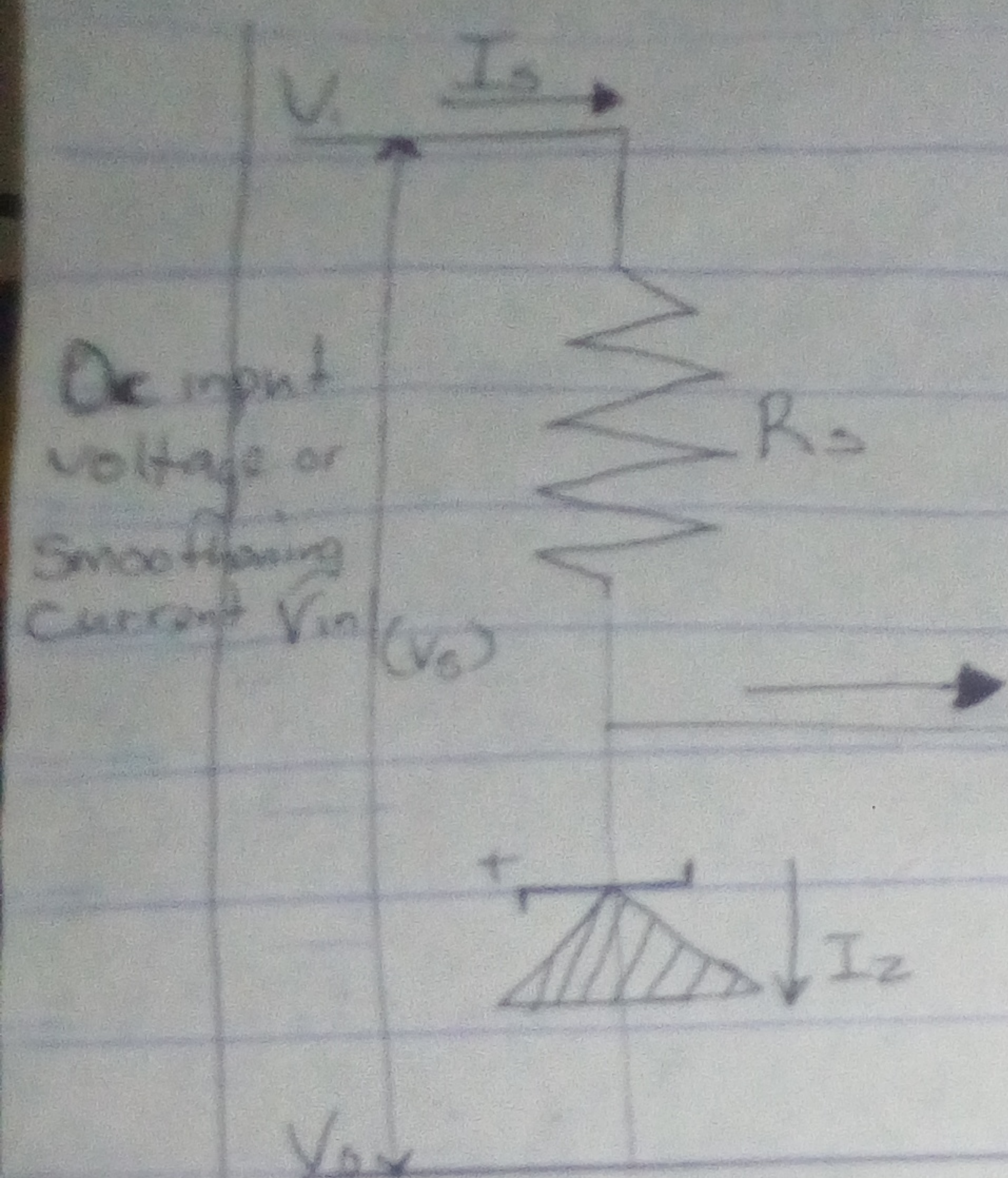
1 The zener diode (or breakdown diode) is a standard PN junction diode but are designed with a low pre-determined Reverse Breakdown Voltage which takes advantage of high reverse voltage. The zener diode is a signal diode consisting of a silicon PN junction. When biased in a forward direction, the diode behaves like a normal signal-diode but when in reverse direction the diode breakdown voltage is reached at a point where a process called Avalanche Breakdown

Symbol for Zener diode



Zener voltage

The zener diode I-V characteristics



where

R_s - Resistor

V_s - Voltage source

V_{out} - stabilized output voltage

R_L - Load Resistance

I_z - Load current across zener diode

The circuit Diagram for Zener diode

2 $P_z = 5W$ (Max Power)

$I_z = 500mA = 0.5A$, $V_z = 20V_{max}$

$20V_{max}$

Max current = $\frac{\text{Max Power}}{\text{Voltage}} = \frac{5W}{V} = 0.5A$

$V_z = 10V_{dc}$

Minimum resistance = $\frac{V_s - V_z}{I_z}$

$V_{dc} = 0.637 V_{max}$
 $= 0.637 \times 20$
 $= 12.74 V_{dc}$

Min resistance = $\frac{12.74 - 10}{0.5} = 5.48 \Omega$

ii Load current $I_L = \frac{V_z}{R_L} = \frac{10}{500} = 0.02A$ or $20mA$

$I_z = I_s - I_L$
 $= 500 - 20 = 480mA$