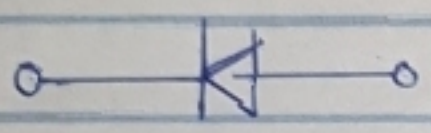
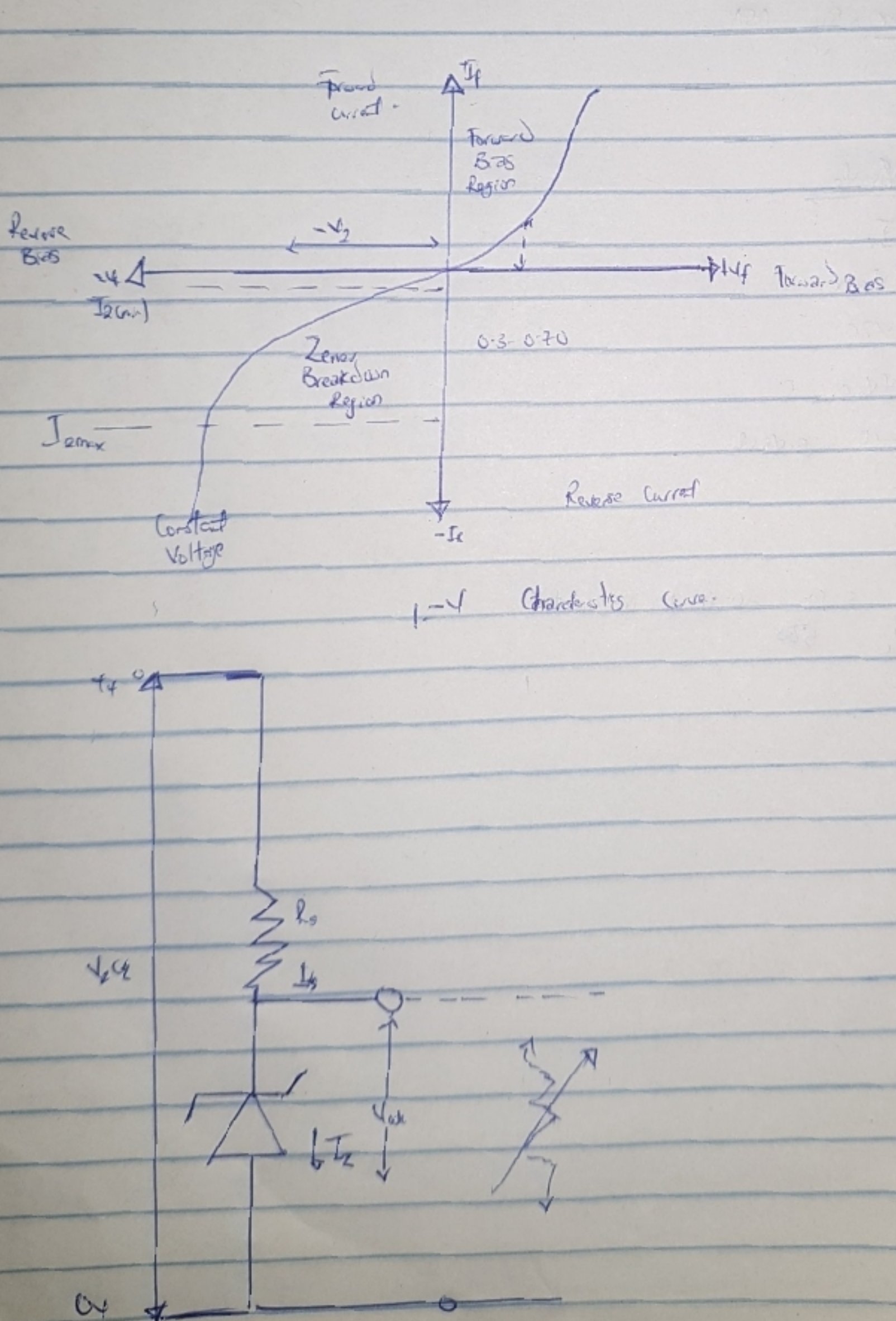
Author: OGHENEFEGOR KINGDOM

18/MHS01/322

ELECTRICAL ENGINEERING

1. A Zener diode is a diode similar to the standard P-N Junction diode but they are specially designed to have a low and specified Reverse breakdown voltage.






I-V Characteristics Curve.

$R_S$ - Resistor

$V_S$ = Voltage source

$V_{out}$ - Stabilized output voltage

$R_L$ - Load Resistance

$I_z$ - Load Current across Zener diode

2. Max Pwr = W $I_z$ = 500mA = 0.5A, 2W $V_S$

Maximum Current = $\frac{\text{Maximum Power}}{\text{Voltage}} = \frac{5W}{V} = 0.5A$

$V_2$ = 10volts

Minimum resistance = $\frac{V_S - V_2}{I_z}$

$V_{DC} = 0.637 V_{max}$

$= 0.637 \times 20$

$= 12.74 V_{DC}$

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

ii Load current $I_L = \frac{V_2}{R_L} = \frac{10}{500} = 0.02A$ or 20mA

$I_Z = I_S - I_L$

$= 500 - 20$

$= 480mA$.