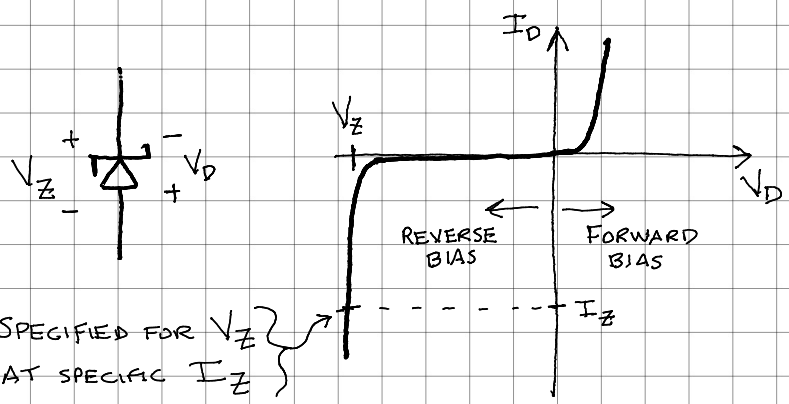


ZENER DIODES

W2AEW

(NOT ALL CREATED EQUAL)

BASICS



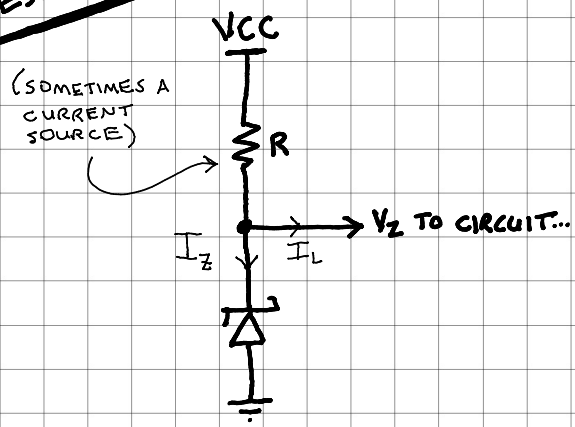
SPECIFIED FOR V_Z
AT SPECIFIC I_Z

USES

- REVERSE BREAKDOWN IS USED FOR:
 - SHUNT REGULATOR
 - REFERENCE VOLTAGE
 - VOLTAGE CLAMP
 - ... MORE...

TYPICAL V_Z
2.4V TO 200V OR MORE

DESIGN INFO



- DESIGN FOR SPECIFIC I_Z
(ACCOUNT FOR LOAD)

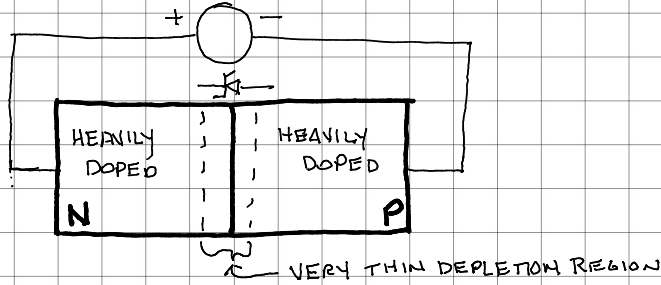
$$R = \frac{(V_{CC} - V_Z)}{(I_Z + I_L)}$$

2

WZAEW

ZENERS: NOT ALL CREATED EQUAL

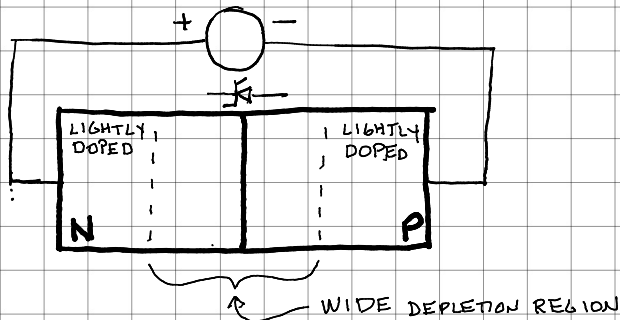
- ZENERS UP TO $V_Z \approx 5$ TO 6 V: (TRUE ZENER DIODES)



ZENER

- ELECTRIC FIELD ACROSS DEPLETION REGION CAUSES CARRIERS TO "TUNNEL" THROUGH
- QUANTUM TUNNELING

- ZENERS WITH $V_Z > 5$ OR 6 V: (AVALANCHE DIODES)



AVALANCHE

- ELECTRIC FIELD CAUSES TREMENDOUS ACCELERATION OF CARRIERS - FAST ENOUGH TO SMASH ELECTRONS FROM OTHER ATOMS, WHICH SMASH INTO MORE, AND SO ON...
- IMPACT IONIZATION

TEST CIRCUIT

W2AEW

