

***OPERATING INSTRUCTIONS***

**ZENER DIODE VOLTAGE REGULATOR**



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## ZENER DIODE VOLTAGE REGULATOR

*Zener diode as voltage regulator* :- The prime function of a zener diode is to regulate or say stabilize the voltage across a given load. The study of its function as a voltage regulator proceed following steps.

### **a. The input characteristics :**

*Varying the input voltage keeping load constant* :- Connect the circuit as shown in fig 2. Keep supply control at minimum.

2. Keep load  $R_L$  at 750 ohms for Q point . Increase the input voltage  $V_s$  in step of 1 volt and note voltage  $V_1$  and  $V_2$ .

where  $V_1$  is the input and  $V_2$  is the output voltage across zener.

3. Plot curves between input - output voltage at load constant. Find out the  $\delta V_1$  and  $\delta V_2$ , from the plot and calculate line regulation as

% Line regulation =  $[\delta V_2 / \delta V_1] \times 100$  percent.

### **b. The output characteristics :**

*Varying the load keeping input voltage constant* :- Connect the circuit as shown in fig 2. Keep supply control at minimum.

2. Keep load  $R_L$  at 3000 ohms. Increase the input voltage  $V_1$  to 12 Vdc.

3. Decrease the load and note the voltage  $V_2$  with load value.

4. Plot curves between load and output voltage at input constant. Find out the  $\delta V_2$  and  $V_z$  at Q point at set load value from the input plot and calculate load regulation as

load regulation % =  $[\delta V_2 / V_z \text{ at Q point}] \times 100$  in percent.

Zener diode VR ch - 2.

Note:  $\delta V_2$  is zener voltage at minimum and maximum load current in stable region. The Q point is fixed in input ch plot.

The input voltage held 12V constant.

The  $\delta V_z$  is very small note it carefully.

Taking  $R_L$  along the log scale ease to draw plot for output ch.

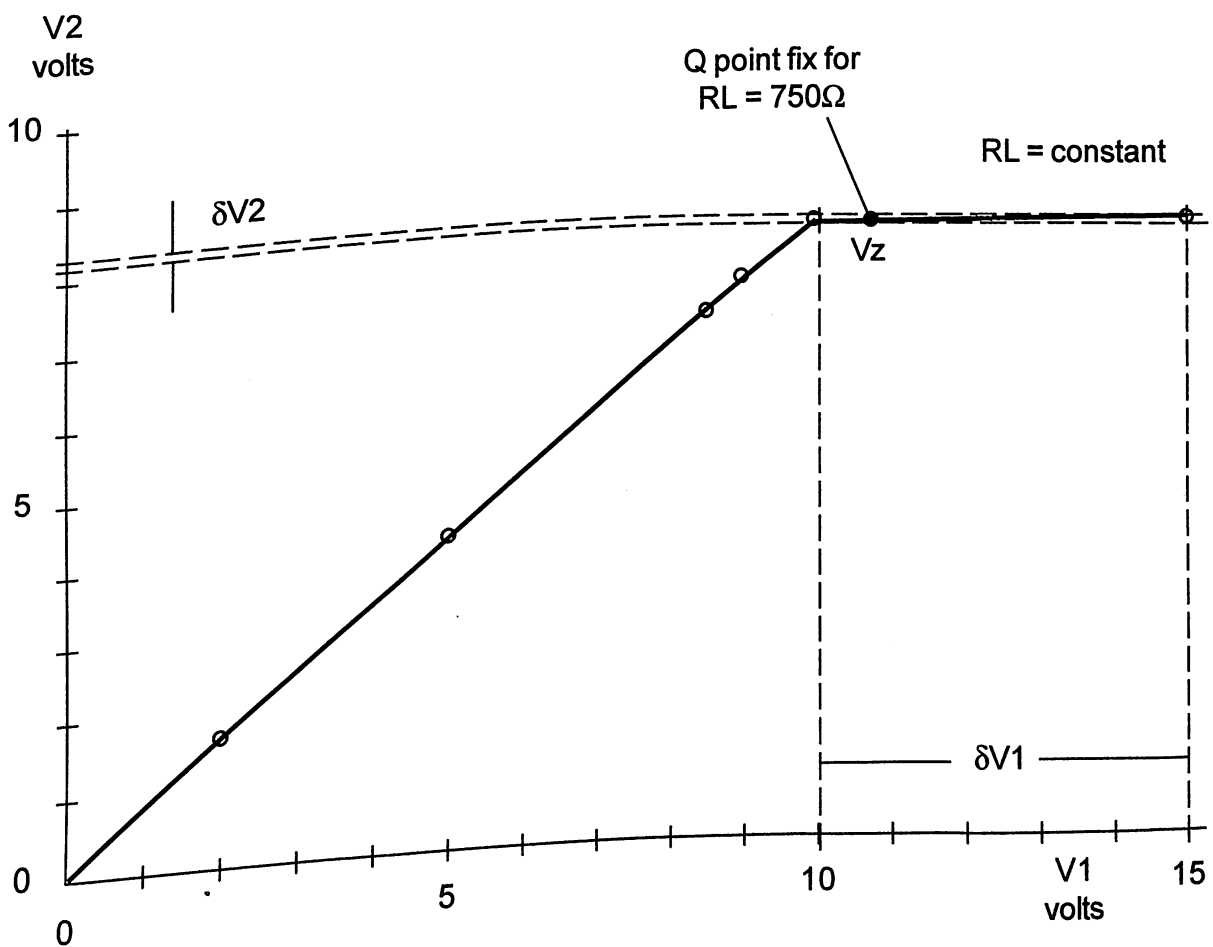


Fig 1 : Characteristic plot for zener diode regulator input - output.

Zener diode VR ch - 3.

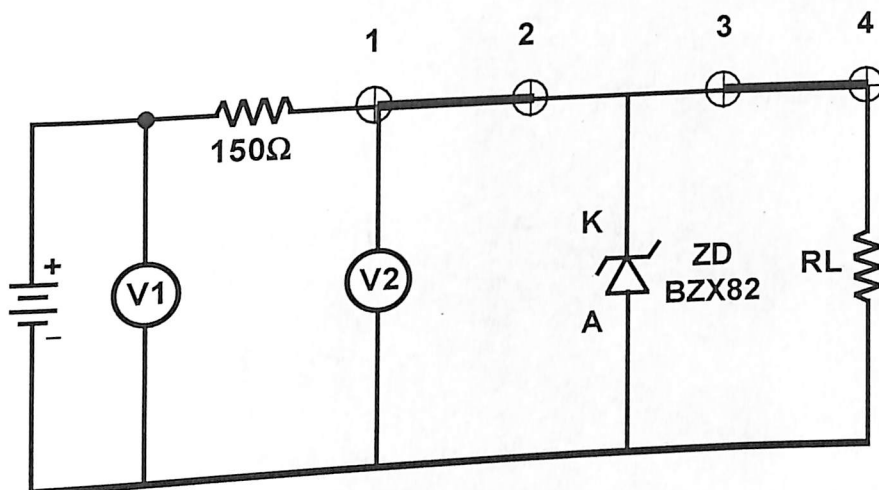


Fig 2 : Connection diagram for zener diode regulator characteristics.

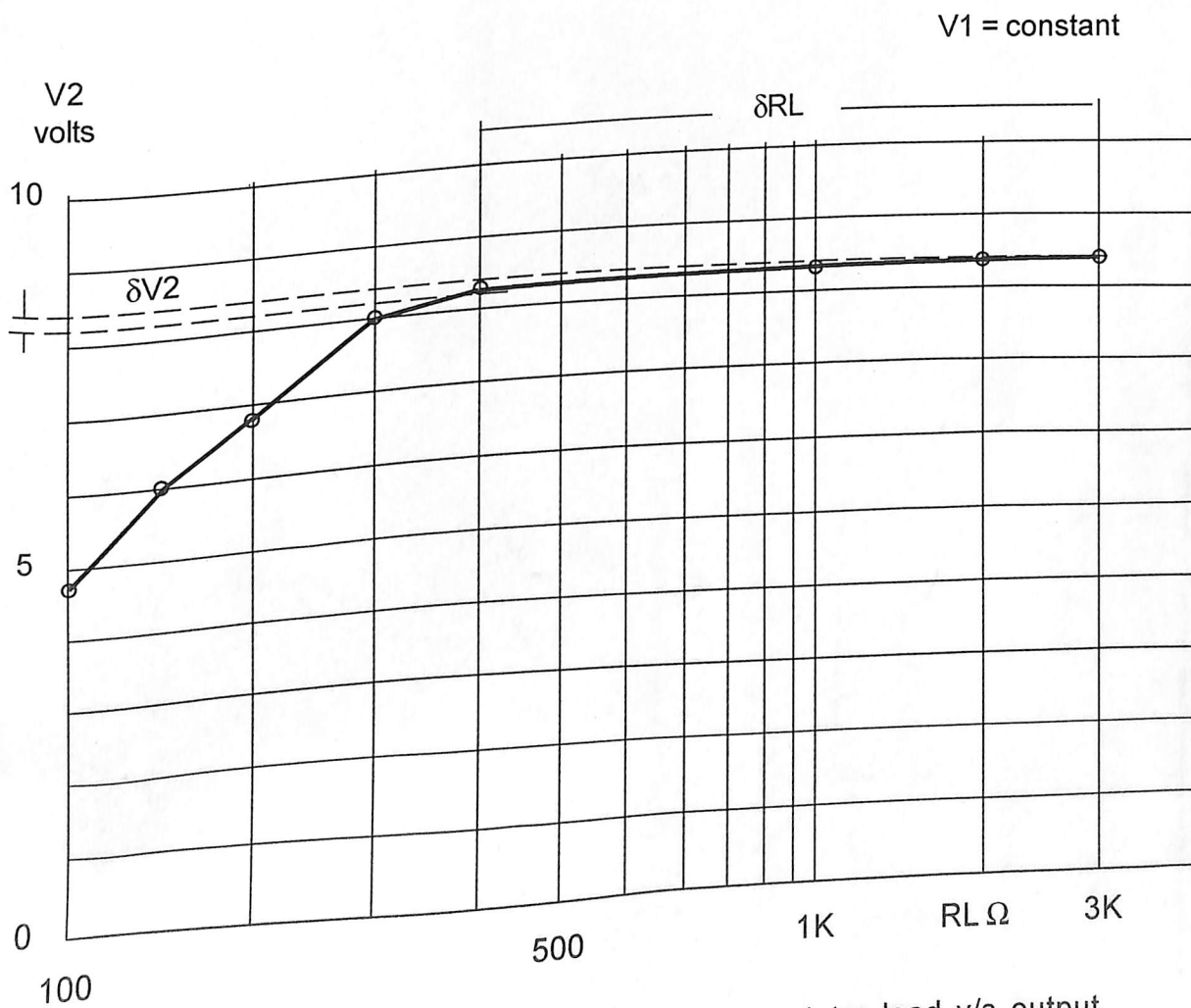


Fig 3 : Characteristic plot for zener diode regulator load v/s output..