

Max power we dissipate

$$V_{\max} = 5.5V$$

V_i with $R \leq 50\Omega$ will always be $3.6V$

Voltage drop across the Resistor

$$V_R = 5.5 - 3.6V$$

$$P_R = I_R^2 R = \frac{V_R^2}{R} = \frac{(5.5 - 3.6)^2}{\leq 50\Omega}$$

$$R = 47\Omega \leq 50\Omega \quad P_R = 77mW$$

What about the current through the Zener diode

$$P_Z = I_Z^2 \cdot R_Z = \underbrace{I_Z}_{3.6V} \cdot \underbrace{V_Z}_{3.6V}$$

When $V = V_{\max}$

that will be the maximum current flowing through the system.

Now the current flowing through the Load will be $\frac{V_Z}{R_L} = I_L$

because once I turn the Zener on ($V > V_{\min}$), the voltage drop across it is V_Z