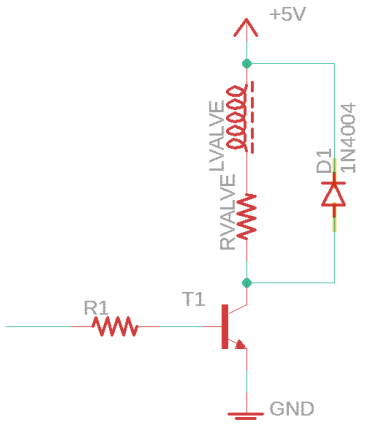

$$P_{valve} = 550\ mW \quad R_{valve} = 46\ \Omega$$

$$P_{valve} = I_{valve}^2 * R_{valve}$$

$$I_{valve} = \sqrt{\frac{P_{valve}}{R_{valve}}} = \sqrt{\frac{550\ mW}{46\ \Omega}}$$

$$I_{valve} = 109\ mA$$

BC 337 NPN Transistor

$$h_{FE} = 100 \quad I_C = 100mA \quad V_{CE(ON)} = 1.2V$$

$$I_B = \frac{I_C}{h_{FE}} = \frac{100\ mA}{100} = 1mA$$

BE mesh

$$-TTL + I_B R + V_{CE(ON)} = 0$$

$$-3.3V + (1\ mA)R + 1.2V = 0$$

$$R1 = \frac{2.1V}{1mA} = 2.1k\Omega$$

CE mesh

$$-V_{cc} + R_{valve} I_C + V_{CE} = 0$$

$$-3.3V + 46\Omega\ 100mA + V_{CE} = 0$$

$$V_{CE} = 1.3V$$