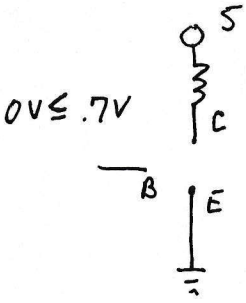
OPTO - Coupler

Transistor
2N2222

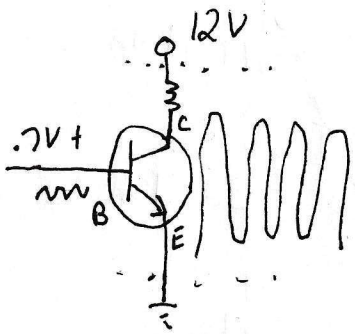
cutoff



OFF switch

OPEN
circuit

Active

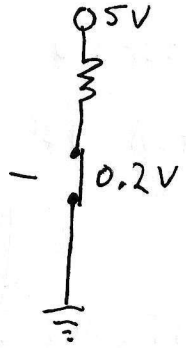


Amplifier

β = Gain

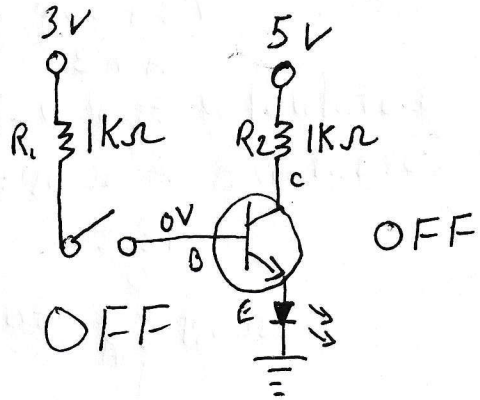
$\frac{I_C}{I_B}$

Saturation



ON switch

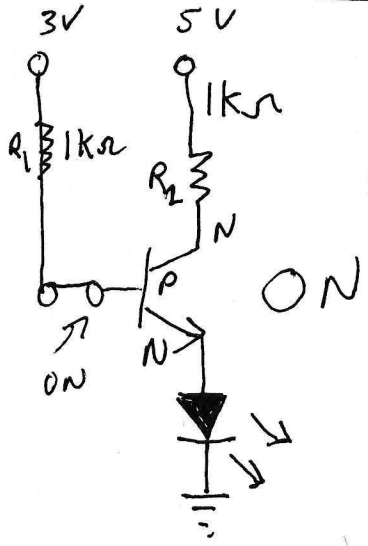
closed
circuit



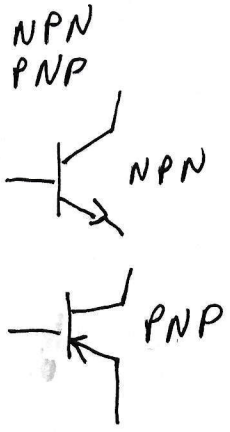
OFF

0V < .7V

CUTOFF



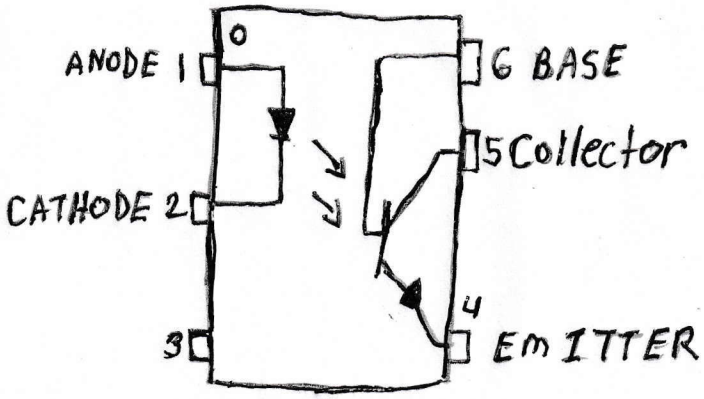
Saturation



OPTO - Coupler

4N35

3.3V 5V



Forward Voltage is 1.2V.

$R_1 = \frac{V_{in} - 1.2V}{5mA}$

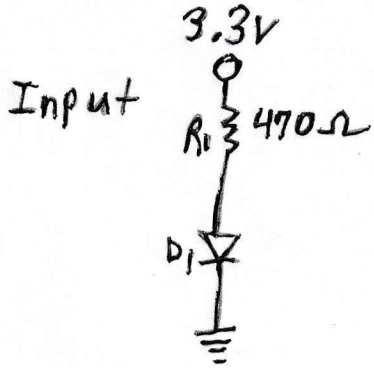
$R_1 = \frac{3.3V - 1.2V}{5mA} =$

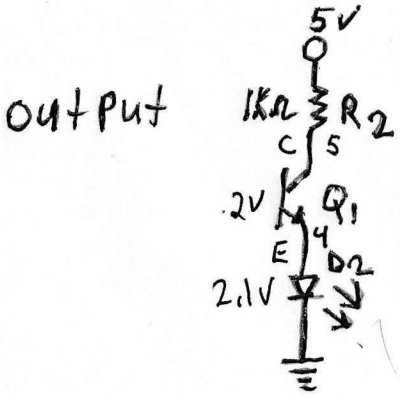
$R_1 = 420\Omega$ → Calculated

$R_1 = 470\Omega$ → Available

I Limit is 10-20mA.
Choose 5mA for reliability

$V = IR$





$V_{cc} = 5V$
$LED = 2.1V$
$Q_1 = 0.2V$

Current limit
1-5mA

$R_2 = \frac{5 - 2.1 - 0.2}{3mA} = 900\Omega$

use $1K\Omega = 1000\Omega = R_2$

Bible Verse

ISAIAH 41:10

Fear thou not; for I am with thee: be not dismayed; for I am thy God: I will strengthen thee; yea, I will help thee; yea, I will uphold thee with the right hand of my righteousness.