$V_{OUT} = 10 \div 20V$ $V_{IN} = 36 \div 40V$ $R_{SARCINA} = 800\Omega$

$R_1 = \frac{V_{in} - V_{LED}}{I_{LED}} = \frac{40-2}{10} = 3,8K\Omega \rightarrow$ ~~alegem $R_1 = 3,9K\Omega$~~ ! Refacut

$R_{13} = \frac{V_{OUT} - V_{LED}}{I_{LED}} = \frac{20-2}{10} = 1,81K\Omega \rightarrow$ ~~alegem $R_{13} = 1,8K\Omega$~~ ! Refacut

$i_{D1} = \frac{V_{IN} - V_{Z1}}{R_3} = \frac{40 - 2,7}{3,3} = 11,3mA$

pt BC856B/BC846 $\Rightarrow V_{BE} = 0,7V$

$i_{C1} = \frac{V_{Z1} - V_{BE}}{R_2} = \frac{2,7 - 0,7}{330} = 6mA$

$i_{Z2} = i_{C1} = 6mA$ $V_{CE1} = V_{IN} - V_{Z1} + V_{BE} - V_{Z2} = 40 - 2,7 + 0,7 - 6,2 = 31,8V$

$V_{B3} = V_{B4} = V_{Z2} = 6,2V$

$V_{BE} = V_{B3} - V_{E3} \Rightarrow V_{E3} = V_{BE} + V_{B3} = 0,7 + 6,2 = 6,9V$

$\hookrightarrow V_{E3} = V_{E4} = 6,9V$

$i_{C2} = \frac{V_{Z1} - V_{BE}}{R_4} = \frac{2,7 - 0,7}{2,7} = 0,74mA$

$V_{CE2} = V_{IN} - V_{Z1} + V_{BE} - V_{E3} = 40 - 2,7 + 0,7 - 6,9 = 31,1V$

$V_{CE3} = V_{CE4} = V_{E3} - V_{BE} = 6,9 - 0,7 = 6,2V$

$i_{C3} = i_{C4} = \frac{i_{C2}}{2} = \frac{0,74}{2} = 0,37mA$

$V_{C5} = V_{OUT} + 2V_{BE} = 20 + 2 \cdot 0,7 = 21,4V$

$V_{E5} = 0 \Rightarrow V_{CE5} = V_{C5} = 21,4$

$i_{R7} = i_{C5} = \frac{V_{IN} - V_{C5}}{R_7} = \frac{40 - 21,4}{4,7} = 4mA$

$V_{CE7} = V_{IN} - V_{OUT} = 40 - 20 = 20V$

$i_{C7} = \frac{V_{OUT}}{R_{SARCINA}} = \frac{20}{800} = 25mA$

$V_{CE6} = V_{CE7} - V_{BE} = 19,3V$, $\beta = 100$

$i_{C6} = \frac{i_{C7}}{\beta} = \frac{25}{100} = 0,25mA$

In regim normal, Q_8 și Q_9 sunt blocați $\Rightarrow i_{C8} = i_{C9} = 0$