(1.1)

$$\alpha_m = \frac{1}{L_a} \ln\left(\frac{1}{r_1 r_2}\right)$$

$r_1 = \sqrt{R_1}$

$r_2 = \sqrt{R_2}$

$$N_{th} = N_{t2}\, e^{(\langle \alpha_i \rangle + \alpha_m)/\Gamma_{gon}}$$

$\alpha_i = 6\ cm^{-1}$ $L_a = 100 \cdot 10^{-4}\ cm$

$r_1 = \sqrt{0,3}$ $r_2 = \sqrt{0,9}$ $\alpha_m = 727,9074$

$$\alpha_i = \frac{6}{cm} = 600\ m^{-1}$$

$$\Gamma_{gon} = \alpha_m + \alpha_i = 2,0598 \cdot 10^3\ m^{-1}$$

$$N_{t2} = 1,8 \cdot 10^{18}\ cm^{-3} = \frac{1,8 \cdot 10^{18}}{1\ cm^3} =$$

$$= \frac{1,8 \cdot 10^{18+12}}{10^6\ m^3} = 1,8 \cdot 10^{12}\ m^{-3}$$

$$N_{th} = N_{tr}\, e^{(\langle \alpha_i \rangle + \alpha_m)/\Gamma g_{0n}}$$

$$\Gamma a_0 (N - N_{tr}) =$$

$$a_0 = 5,39 \cdot 10^{-16}\ cm^2 = 5,39 \cdot 10^{-16} \cdot 10^{-9}\ m^2$$

$$= 5,39 \cdot 10^{-20}\ m^2$$

$$g_{th} = a_0 (N_{th} - N_{tr})$$

$$\Gamma g_{th} = \langle \alpha_i \rangle + \alpha_m$$

$$\Gamma > 0,06$$

$$N_{th} = \frac{\langle \alpha_i \rangle + \alpha_m}{\Gamma a_0} + N_{tr} = 2,21429 \cdot 10^{18}\ cm^{-3}$$

$$I_{th} = \frac{qV}{\eta_i} \left[A N_{th} + B N_{th}^2 + C N_{th}^3 \right] =$$

$= 0,0055007\ mA$