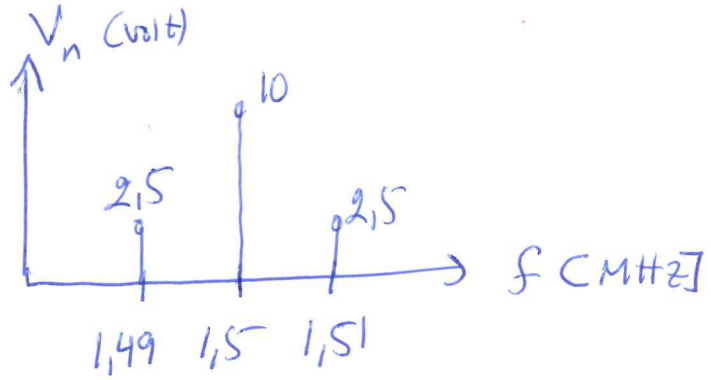
RRY010 25/8 2021 Kortsvar/lösn

① Se kurslitteratur.

② a/ Plotta $v_{AM}(t) = 10\left[1 + 0{,}5\cos(2\pi 10^4 t)\right]\cos(2\pi 1{,}5\cdot 10^6 t)$ volt

b/

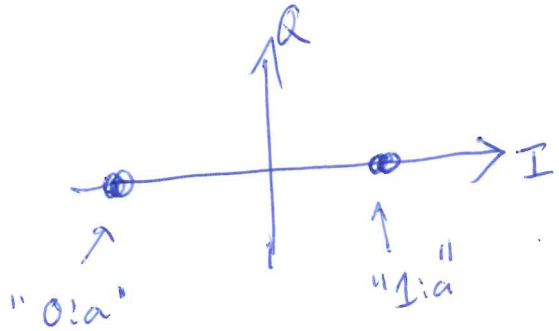


c/ $P = \frac{1}{2R}\cdot\left\{V_c^2 + \left(\frac{V_m}{2}\right)^2 + \left(\frac{V_m}{2}\right)^2\right\} \simeq \underline{\underline{7{,}03\ W}}$

③ $f_c = 95$ MHz, $f_m = 15$ kHz

$B = 2f_m\cdot(1+\beta) = 2{,}15\cdot\left(1+\frac{75}{15}\right) = 180$ kHz

④ Modulationsmetod: Binär-PSK (två olika fas-lägen)



(5)

a) $\frac{V_{max}}{V_{min}} = SVF \approx 5{,}3$

b) $Z_{in} = Z_{last} = 25 - j60\ \Omega \quad (l = 0{,}5\lambda)$

c) Ett minimum.

d) $V^+ = V_G \cdot \frac{1}{2} = 5$ volt

$|I^+| = \frac{|V^+|}{Z_0} = 0{,}1$ ampere

e) $\frac{\lambda}{4}$-transformator inkopplingspos. $0{,}148\lambda$ från last

$Z_{0,tr} = 50\sqrt{0{,}19} \approx 21{,}8 \approx \underline{22\ \Omega}$

parallellkopplad kortslutен stubbe: inkopplingspos. $0{,}08\lambda$ från last
stubblängd $0{,}082\lambda$

---

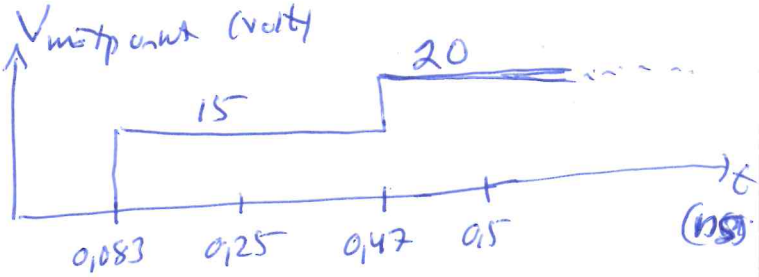
(6) a) $Z_0 = \sqrt{\frac{L}{C}} = \sqrt{\frac{\mu}{\epsilon}}\frac{d}{b} \simeq 50{,}2 \simeq \underline{50\ \Omega}$

b) $\Gamma_G \simeq 0 \Rightarrow$ endast en reflex (vid last)

$\Gamma_L = \frac{1}{3}$

$V_0^+ = 15$ V

$\tau = 0{,}25$ ns



c) $V_{last} = 20$ V (t → ∞)

d) $\lambda = 0{,}15$ m $\Rightarrow l = \frac{\lambda}{2}$ } $\Rightarrow$ max vid last & ingång

$\Gamma_L > 0$