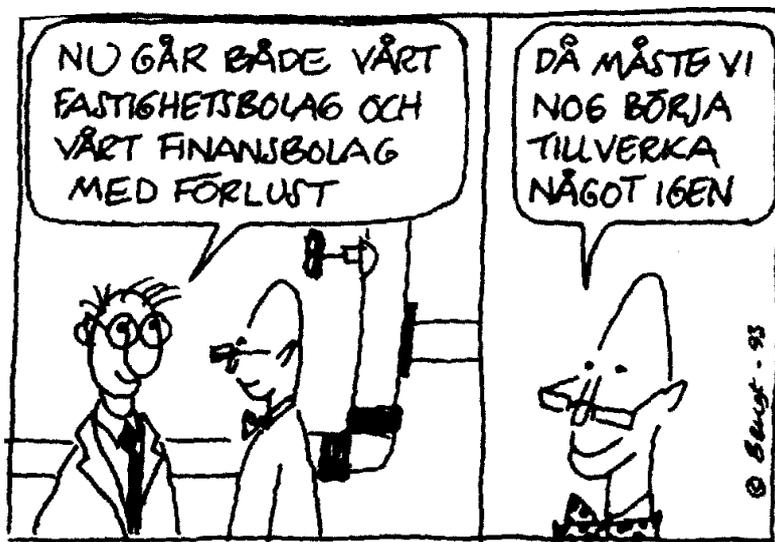


12.4 The excess junction temperature (above 25 °C) is: $T_j = 172 \cdot 0.4 = 69$ °C. The contribution from excess temperature, process spread, and reduced voltage is:

$$\begin{aligned} \tau_{CL req} &= (1 + 3.75 \cdot 10^{-3} \cdot 69)(1 + 0.35)(1 + 0.3 \cdot 0.25) \tau_{CL design} = \\ &= 1.2588 \cdot 1.35 \cdot 1.075 \tau_{CL design} = 1.827 \tau_{CL design} \end{aligned}$$

$$f_{CL design} = 1.827 \cdot f_{CL req} = 1.827 \cdot 50 = 91.4 \text{ MHz}$$

Thus, the circuit should be designed with nominal parameter values to run with a clock frequency that exceeds the required frequency with 83%.



"Now when our real estate and finance branches are in the red we may have to start to manufacturing something"