$\alpha := 15 \frac{W}{m^2 K}$ $\lambda := 237 \frac{W}{m K}$ $T_a := 20\ °C$ $w_{bf} := 12.8\ mm$ $w_f := 4\ mm$

$n_f := 4$ $n_{bf} := 3$ $d := 60\ mm$

$A := w_{bf} \cdot d$ $A_f := w_f \cdot d$ $U := 2 \cdot d + 2 \cdot w_f$ $L := 40\ mm$

$$m := \sqrt{\frac{\alpha \cdot U}{\lambda \cdot A_f}}$$

guess: $T_s := 120\ °C$

$$Q_f := \frac{\alpha \cdot U}{m} \cdot (T_s - T_a) \cdot \tanh(m \cdot L) = 7.544661\ W$$

$$q_{f\_base} := \frac{Q_f}{A_f} = 31436.089236 \frac{W}{m^2}$$

$$\mathrm{Assign}\left(\mathrm{eval}\left(\mathrm{LinSolve}\left(\left\{\frac{\alpha \cdot A \cdot (T_{s2} - T_a)}{A} = q_{f\_base}, \{T_{s2}\}\right\}\right)\right)\right) = 2388.889282\ K$$

T_{s2}

T_{s2} --> temperature at the base of the heat sink, goal of the calculation

$$Q_{bf} := \alpha \cdot A \cdot (T_{s2} - T_a) = 24.142917\ W$$

must be equal to P: $Q_t := n_f \cdot Q_f + n_{bf} \cdot Q_{bf} = 102.607395\ W$