Csúcshőmérséklet számítás (tranziens hőimpedancia)

Molnár Károly

PowerQuattro Zrt.

Fejlesztési igazgató

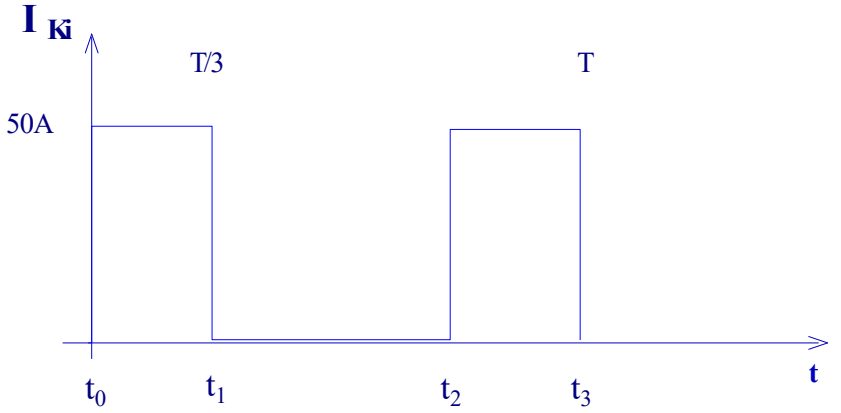
Címzetes Egyetemi Docens

performance in electronics

T51N tirisztor

$r_d = 3{,}6m\Omega$

$U_0 = 1V$



ϑ_{PN}=23,4+40=63,4°C

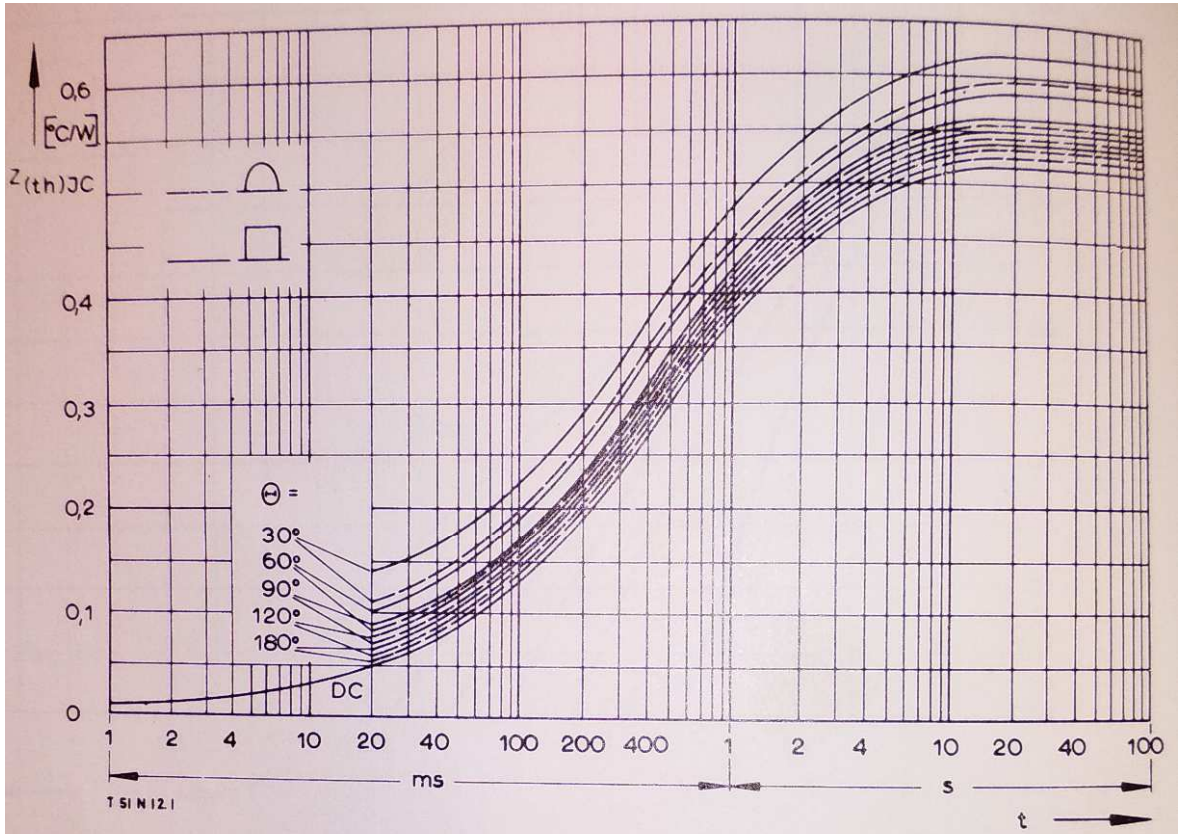
$t_3 - t_0 = 26{,}6ms$

$t_3 - t_1 = 20ms$ $R_{th} = 0{,}65\frac{°C}{W}$

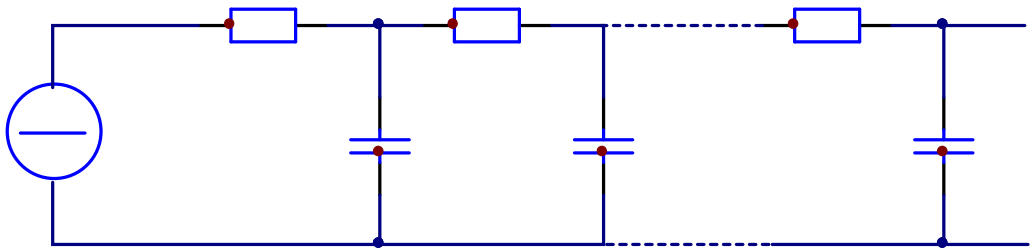
$t_3 - t_2 = 6{,}66ms$

$I_K = \frac{50A}{3}$=16,6A

$I_{eff} = \frac{50A}{\sqrt{3}}$=28,9A



Bild/Fig. 12
Transienter innerer Wärmewiderstand $Z_{(th)JC}$ bei sinus- und rechteckförmigem Stromverlauf.
Transient thermal resistance $Z_{(th)JC}$, junction to case at sinusoidal and square wave current.



$P_V = U_0 * I_K + r_d * I_{eff}^2$ =1V*16,6A+3,6*$10^{-3}\Omega * 28{,}9^2 A = 19{,}6W \cong$20W

$\hat{P}_V = 60W$

$\hat{\vartheta}_{PN} = P_V \sum R_{th} + \vartheta_K - P_V \sum Z_{th_{3-0}} + \hat{P} \sum Z_{th_{3-0}} - \hat{P} \sum Z_{th_{3-1}} + \hat{P} \sum Z_{th_{3-2}} =$

= 20(0,52+0,65) + 40°C - 20*0,072 + 60 * 0,072 - 60 * 0,071 + 60 * 0,0675=

= 23,4+40 – 1,44 + 4,32-4,26 + 4,05 = 68,95°C

Köszönöm a figyelmet!