

R-C Thermal Model Parameters

DESCRIPTION

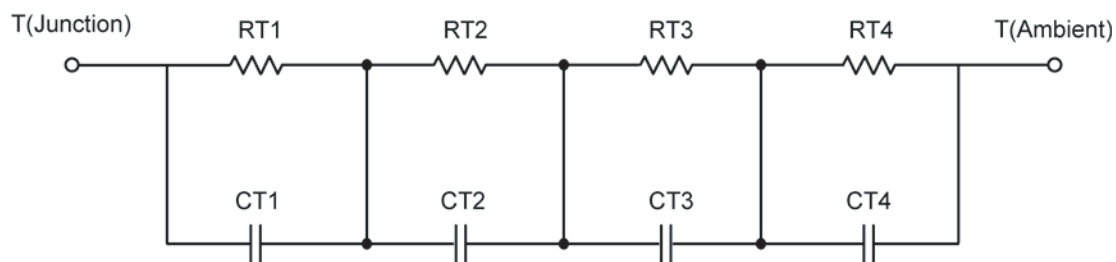
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

Note:

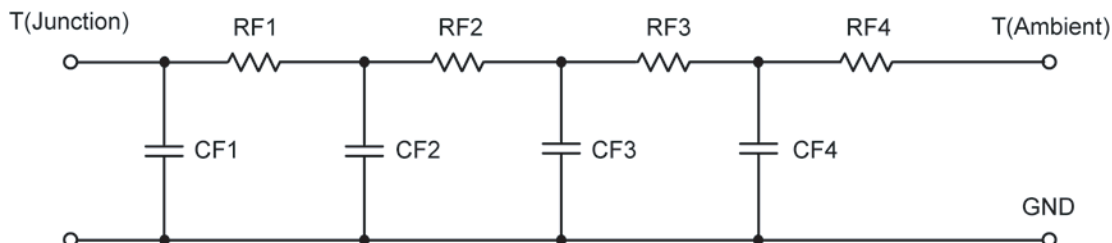
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	6.5652	4.0949 m	N/A
RT2	13.7473	189.8887 m	N/A
RT3	16.5473	1.2620	N/A
RT4	56.6439	3.5515	N/A
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	440.5382 u	30.1087 u	N/A
CT2	4.3223 m	39.3612 m	N/A
CT3	68.6742 m	377.6167 u	N/A
CT4	1.3879	1.2591 m	N/A

This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION**R-C VALUES FOR FILTER CONFIGURATION**

Thermal Resistance ($^{\circ}\text{C}/\text{W}$)			
Junction to	Ambient	Case	Foot
RF1	8.7260	1.9539	N/A
RF2	16.4069	1.4558	N/A
RF3	14.1355	962.3419 m	N/A
RF4	54.3167	628.4086 m	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	417.6865 u	293.5588 u	N/A
CF2	5.7162 m	826.9883 u	N/A
CF3	105.6055 m	740.2535 u	N/A
CF4	1.3744	980.0675 u	N/A

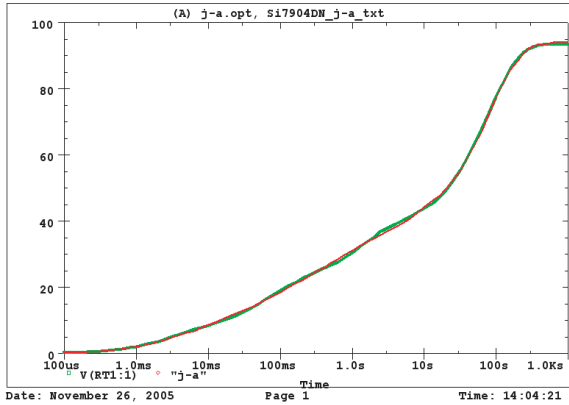
Note: NA indicates not applicable

Reference:

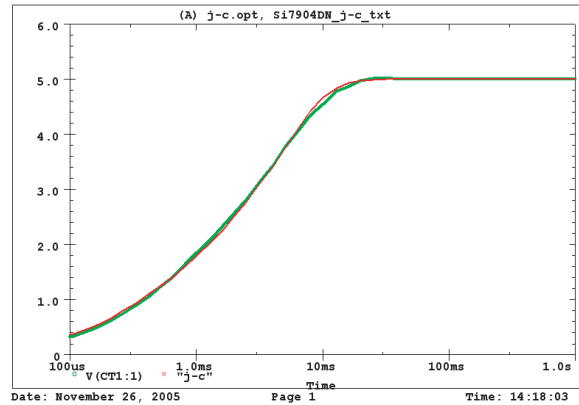
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002



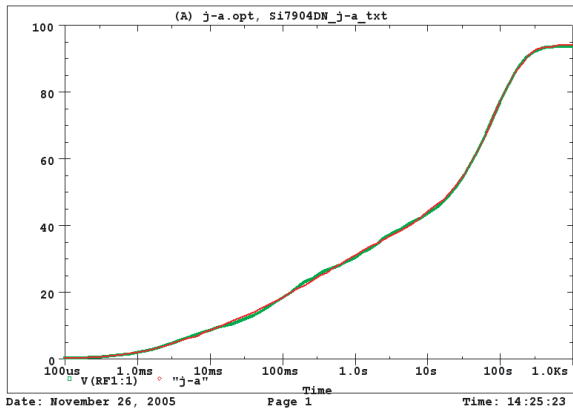
Si7904DN Tank j-a Temperature: 27.0



Si7904DN Tank j-c Temperature: 27.0



Si7904DN Filter j-a Temperature: 27.0



Si7904DN Filter j-c Temperature: 27.0

