

R-C Thermal Model Parameters

DESCRIPTION

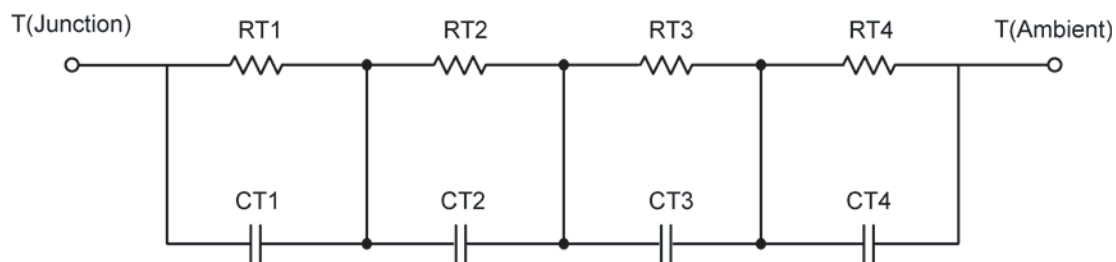
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

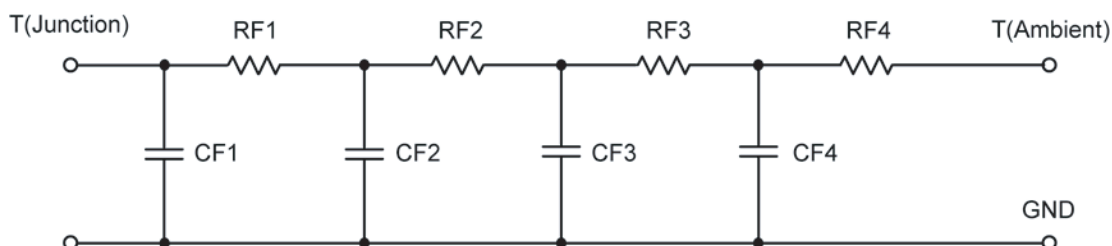
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	10.6072	N/A	594.6719 m
RT2	6.5451	N/A	11.8243
RT3	32.0009	N/A	13.2377
RT4	45.6419	N/A	4.2852
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	815.0453 u	N/A	3.0178 m
CT2	243.5891 m	N/A	7.7403 m
CT3	31.8434 m	N/A	125.8362 m
CT4	1.2519	N/A	497.4729 u

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	8.8589	N/A	4.5817
RF2	6.6722	N/A	4.6315
RF3	35.3515	N/A	7.9983
RF4	43.9584	N/A	12.7469
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	1.0774 m	N/A	406.6431 u
CF2	4.2314 m	N/A	4.5343 m
CF3	27.5138 m	N/A	1.3059 m
CF4	1.2870	N/A	117.0465 m

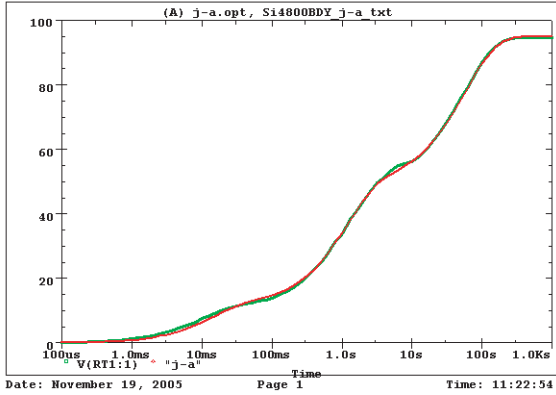
Note: NA indicates not applicable

Reference:

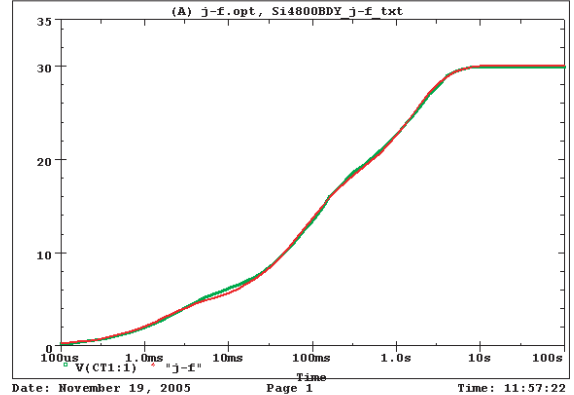
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002



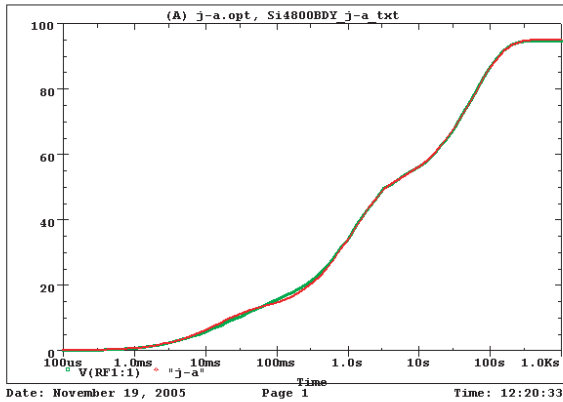
Si4800BDY Tank j-a Temperature: 27.0



Si4800BDY Tank j-f Temperature: 27.0



Si4800BDY Filter j-a Temperature: 27.0



Si4800BDY Filter j-f Temperature: 27.0

