

R-C Thermal Model Parameters

DESCRIPTION

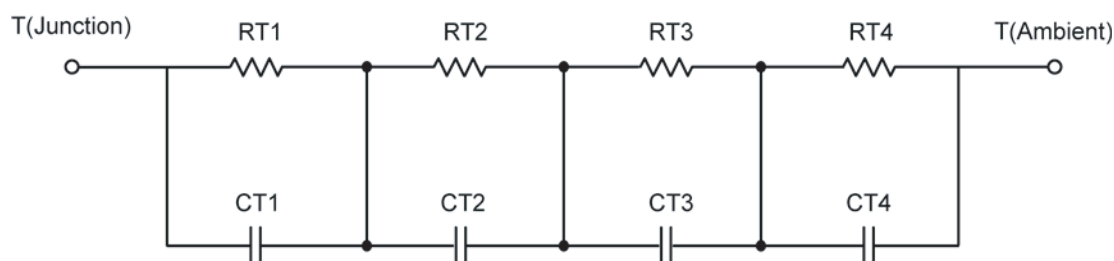
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse 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	9.0596	N/A	2.7510
RT2	10.4825	N/A	9.7601
RT3	34.9521	N/A	14.3671
RT4	55.3377	N/A	13.2693
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.2529 m	N/A	301.8065 u
CT2	269.9715 m	N/A	5.5847 m
CT3	7.6456 m	N/A	19.1707 m
CT4	1.4475	N/A	3.1568 m

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	5.9193	N/A	3.6533
RF2	26.0868	N/A	12.3712
RF3	22.4318	N/A	13.9850
RF4	55.0698	N/A	9.9911
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	549.2082 u	N/A	174.5804 u
CF2	3.3792 m	N/A	1.7302 m
CF3	30.0263 m	N/A	131.0586 u
CF4	1.3573	N/A	19.6276 m

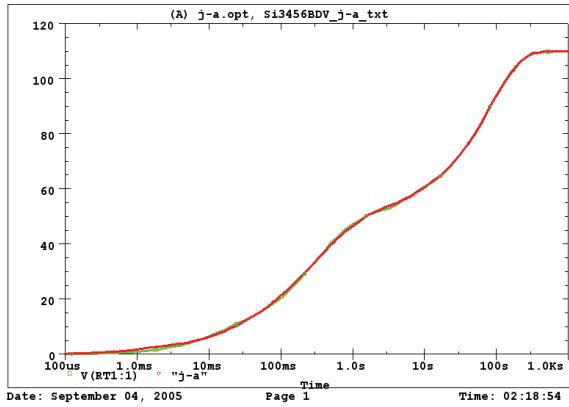
Note: NA indicates not applicable

Reference:

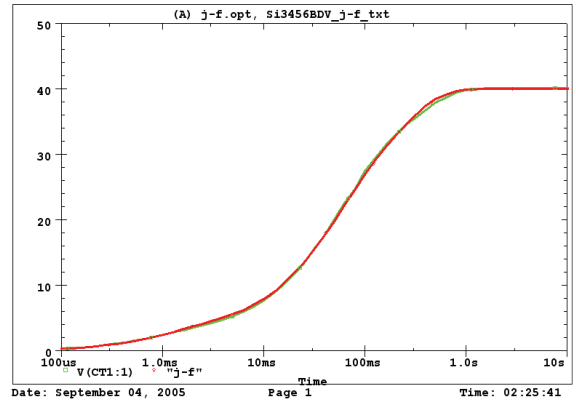
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002



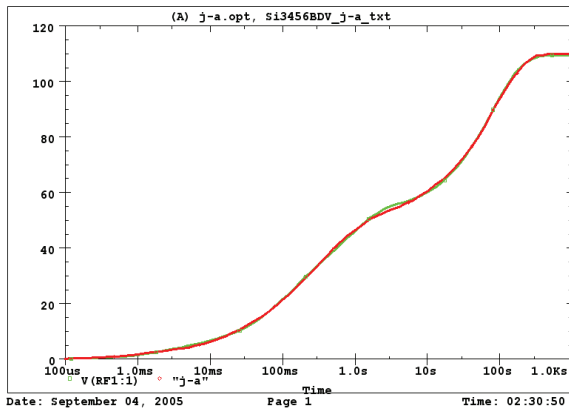
Si3456BDV Tank j-a Temperature: 27.0



Si3456BDV Tank j-f Temperature: 27.0



Si3456BDV Filter j-a Temperature: 27.0



Si3456BDV Filter j-f Temperature: 27.0

