

R-C Thermal Model Parameters

DESCRIPTION

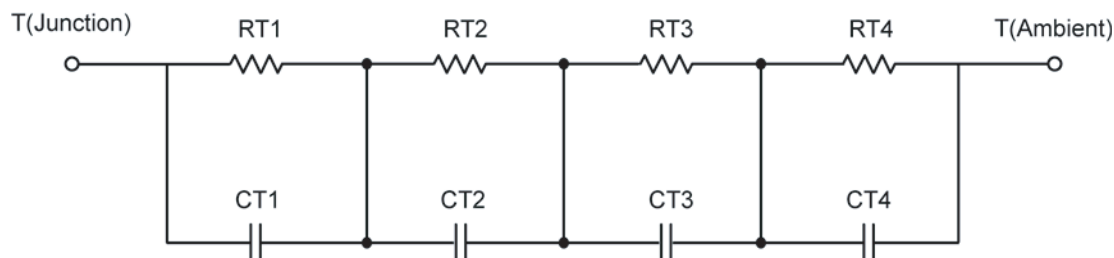
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

R-C values for the electrical circuit in the Foster/Tank configuration are included. The corresponding values for the Cauer/Filter configuration are available upon request.

Note:

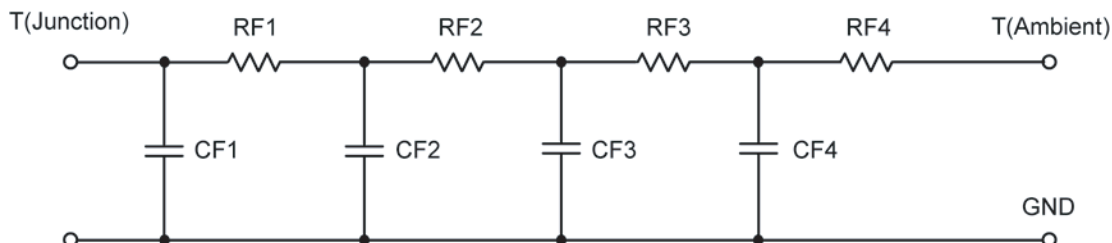
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	21.6313	N/A	8.2337
RT2	7.6735	N/A	1.1523
RT3	9.5731	N/A	6.0831
RT4	46.1140	N/A	6.5558
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	52.5172 m	N/A	66.5992 m
CT2	6.1173 m	N/A	1.1644 m
CT3	1.5650	N/A	7.7891 m
CT4	1.8427	N/A	346.0753 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 (°C/W)			
Junction to	Ambient	Case	Foot
RF1	5.6212	N/A	2.6859
RF2	19.8134	N/A	7.3156
RF3	16.4932	N/A	10.1173
RF4	42.9300	N/A	1.8937
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	3.8314 m	N/A	1.8815 m
CF2	25.4743 m	N/A	7.5150 m
CF3	277.3923 m	N/A	76.4052 m
CF4	1.5334	N/A	1.1352

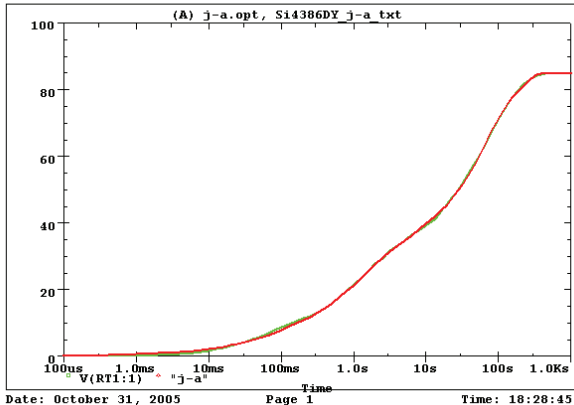
Note: NA indicates not applicable

Reference:

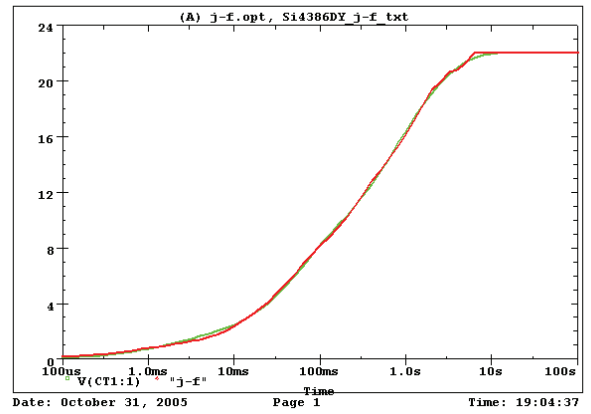
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002



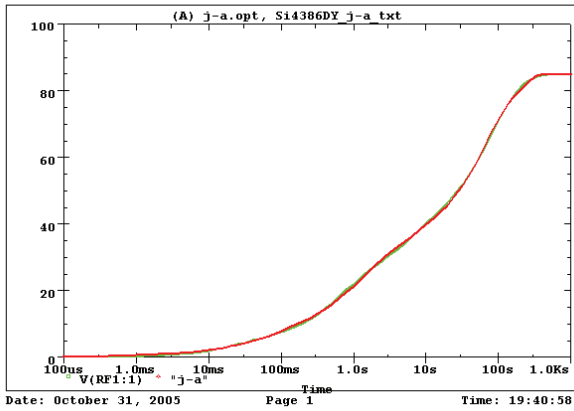
Si4386DY Tank j-a Temperature: 27.0



Si4386DY Tank j-f Temperature: 27.0



Si4386DY Filter j-a Temperature: 27.0



Si4386DY Filter j-f Temperature: 27.0

