

R-C Thermal Model Parameters

DESCRIPTION

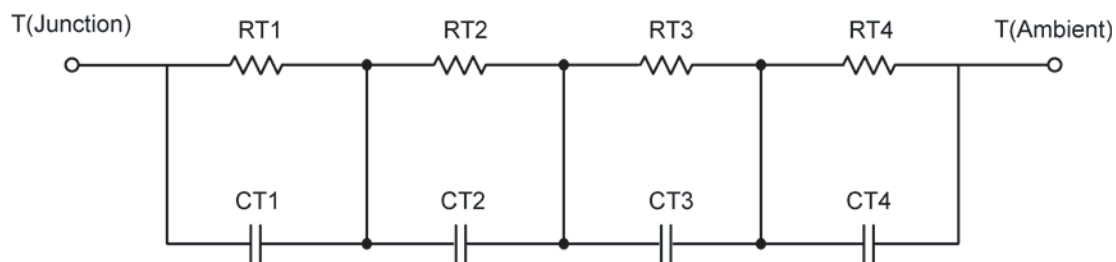
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

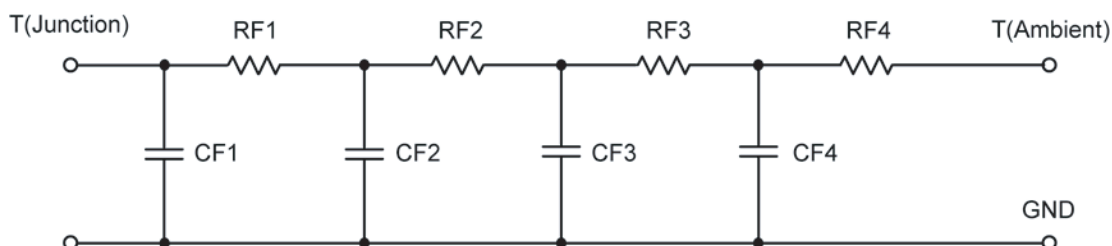
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	816.9183 m	324.4979 u	N/A
RT2	6.3753	286.9499 m	N/A
RT3	8.4873	251.3020 m	N/A
RT4	48.9947	762.3926 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.3984 m	625.3748 u	N/A
CT2	49.9901 m	3.0330 m	N/A
CT3	294.4438 m	39.2410 m	N/A
CT4	1.3751	11.3185 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	7.6597	250.0066 m	N/A
RF2	6.7288	255.7609 m	N/A
RF3	6.9255	578.7731 m	N/A
RF4	43.5775	214.5172 m	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	27.3576 m	1.4941 m	N/A
CF2	220.2736 m	3.1793 m	N/A
CF3	30.2816 m	4.4688 m	N/A
CF4	1.3100	103.3651 u	N/A

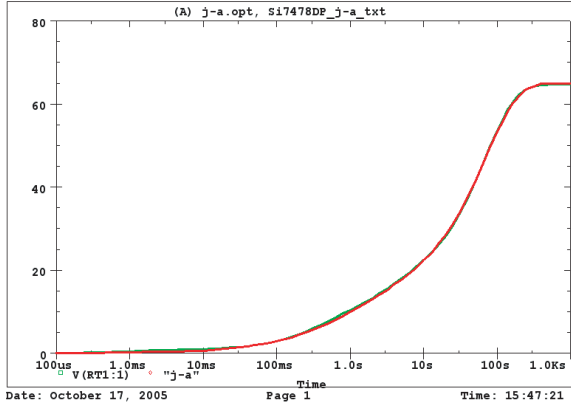
Note: NA indicates not applicable

Reference:

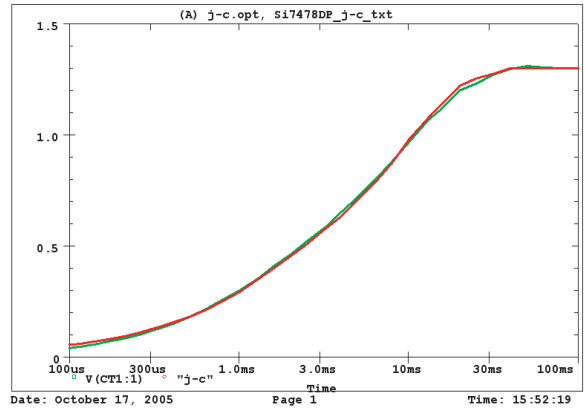
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002



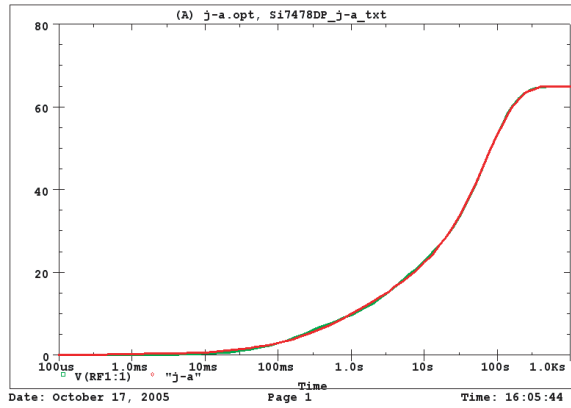
Si7478DP Tank j-a Temperature: 27.0



Si7478DP Tank j-c Temperature: 27.0



Si7478DP Filter j-a Temperature: 27.0



Si7478DP Filter j-c Temperature: 27.0

