

R-C Thermal Model Parameters

DESCRIPTION

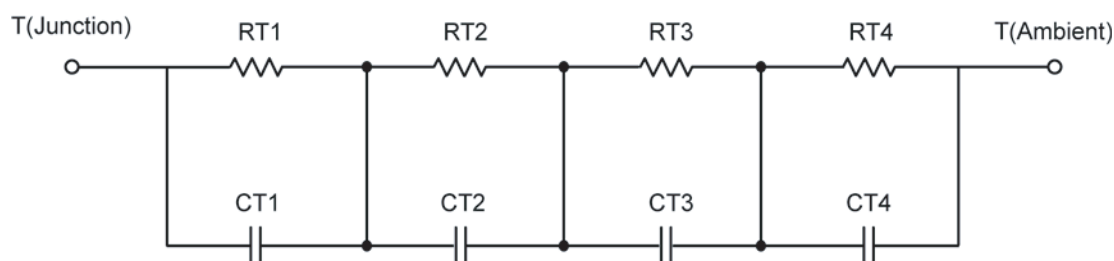
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

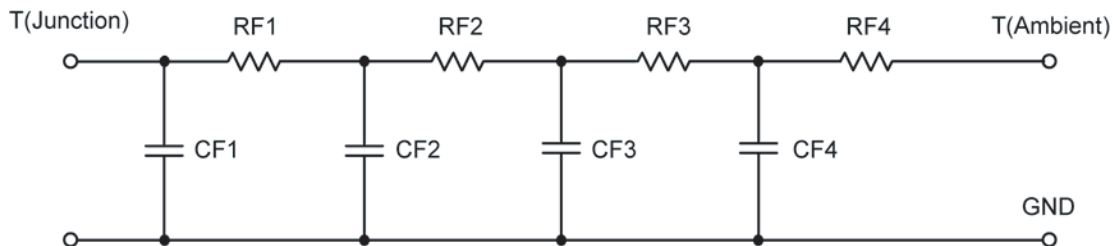
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)			
Junction to	Ambient	Case	Foot
RT1	4.6811	N/A	891.0923 m
RT2	22.4894	N/A	4.0712
RT3	38.0947	N/A	10.1982
RT4	14.3700	N/A	5.7147
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CT1	4.7707 m	N/A	1.3179 m
CT2	35.3707 m	N/A	17.9041 m
CT3	2.0586	N/A	142.5144 m
CT4	300.2025 m	N/A	27.2659 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	9.2689	N/A	1.3810
RF2	13.5460	N/A	9.8812
RF3	20.3323	N/A	5.9800
RF4	36.3667	N/A	3.6972
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	7.1986 m	N/A	1.8920 m
CF2	23.1430 m	N/A	8.7357 m
CF3	73.9096 m	N/A	90.2266 m
CF4	1.9824	N/A	347.4011 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

