

R-C Thermal Model Parameters

DESCRIPTION

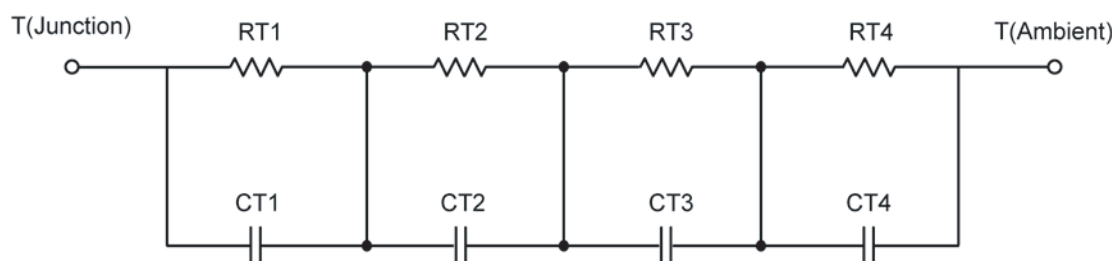
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

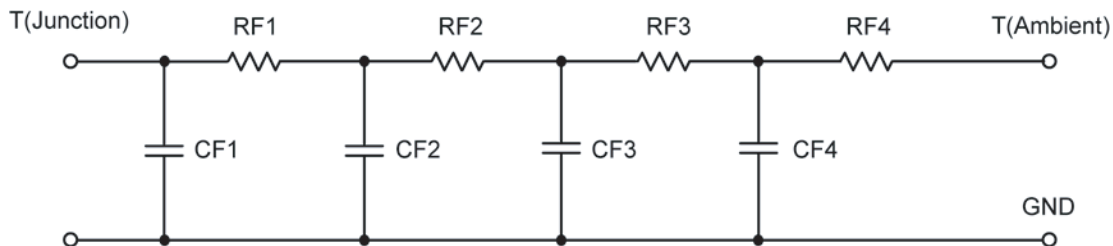
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

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	6.9748	N/A	10.2073
RT2	9.3362	N/A	2.5130
RT3	42.4493	N/A	8.3590
RT4	51.1267	N/A	8.9386
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CT1	1.9916 m	N/A	5.8856 m
CT2	7.9736 m	N/A	448.1246 μ
CT3	12.6508 m	N/A	42.8629 m
CT4	1.2020	N/A	9.5199 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	17.7112	N/A	3.2167
RF2	15.3855	N/A	10.4678
RF3	26.4729	N/A	10.9615
RF4	50.2298	N/A	5.3440
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	1.7309 m	N/A	497.9077 μ
CF2	8.3273 m	N/A	2.6562 m
CF3	2.9762 m	N/A	993.4035 μ
CF4	1.1950	N/A	56.7081 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

