

R-C Thermal Model Parameters

DESCRIPTION

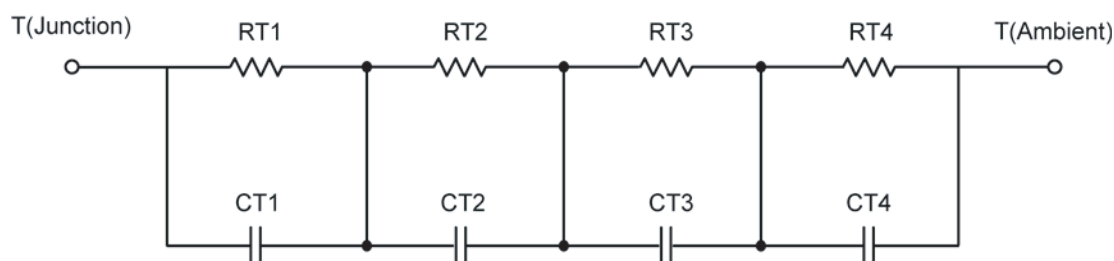
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

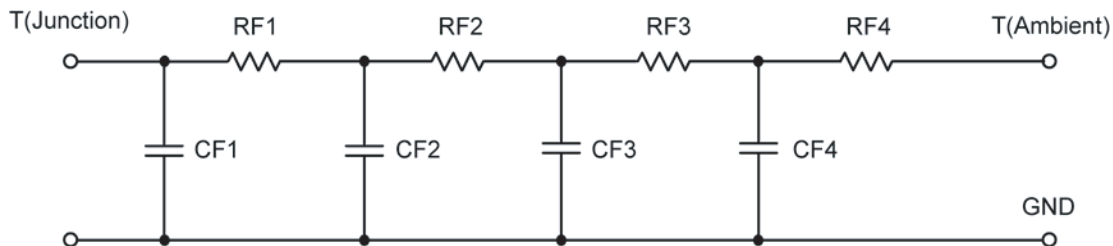
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

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	2.3490	N/A	250.9288 m
RT2	29.5589	N/A	6.7329
RT3	32.0670	N/A	9.1880
RT4	26.1202	N/A	1.7701
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CT1	1.1969 m	N/A	563.0696 μ
CT2	32.0544 m	N/A	13.6449 m
CT3	1.4071	N/A	174.2752 m
CT4	3.6901	N/A	4.8071 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	6.0619	N/A	2.5758
RF2	27.5447	N/A	7.3337
RF3	30.8157	N/A	4.1168
RF4	25.6209	N/A	3.9913
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	5.6116 m	N/A	2.6100 m
CF2	32.7967 m	N/A	9.5520 m
CF3	843.7170 m	N/A	193.9091 m
CF4	1.4531	N/A	2.2668 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

