

## 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:*

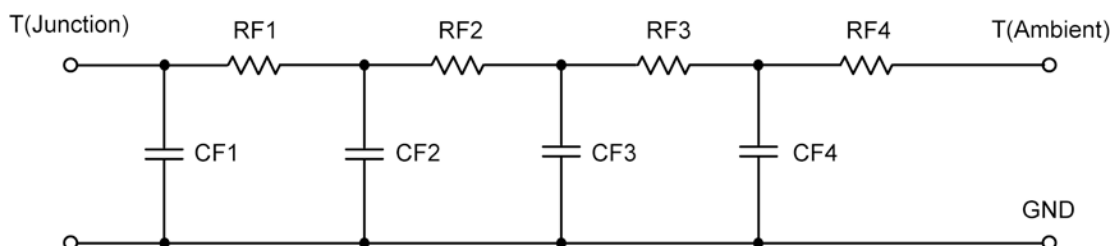
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

### R-C THERMAL MODEL FOR TANK CONFIGURATION



<b>R-C VALUES FOR TANK CONFIGURATION</b>			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	12.1597	N/A	9.7032
RT2	6.4202	N/A	2.5095
RT3	7.8362	N/A	2.7705
RT4	53.5839	N/A	1.0168
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	112.9176 m	N/A	146.0565 m
CT2	16.6496 m	N/A	26.6200 m
CT3	301.4330 m	N/A	31.3157 m
CT4	1.4234	N/A	188.0840 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 ( $^{\circ}\text{C}/\text{W}$ )			
Junction to	Ambient	Case	Foot
RF1	7.6227	N/A	1.4868
RF2	19.1992	N/A	5.7265
RF3	22.4108	N/A	6.5709
RF4	30.7673	N/A	2.2158
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	11.4112 m	N/A	7.7920 m
CF2	58.2876 m	N/A	8.3961 m
CF3	1.0764	N/A	109.7471 m
CF4	763.8258 m	N/A	617.6275 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

