

## 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:*

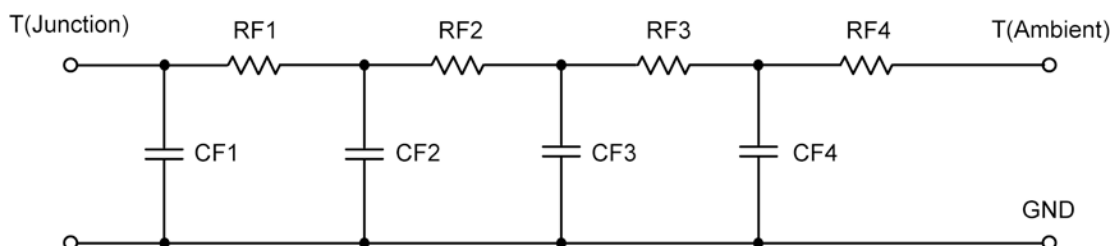
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

### 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	24.0064	N/A	11.4652
RT2	12.6212	N/A	3.8707
RT3	5.7116	N/A	8.7207
RT4	52.6626	N/A	943.4000 m
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	30.4328 m	N/A	77.0166 m
CT2	267.1196 m	N/A	46.1990 m
CT3	1.9554 m	N/A	7.2880 m
CT4	1.2280	N/A	403.4894 u

*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	7.8254	N/A	2.5282
RF2	31.2038	N/A	11.8329
RF3	13.5761	N/A	8.3959
RF4	42.3947	N/A	2.2430
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	2.7125 m	N/A	1.5987 m
CF2	29.1641 m	N/A	5.5820 m
CF3	531.7077 m	N/A	54.1098 m
CF4	861.9407 m	N/A	150.7788 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

