

## 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	28.8997	N/A	22.9528
RT2	7.3047	N/A	5.9111
RT3	20.9223	N/A	1.7928
RT4	52.5607	N/A	9.9214
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.4667 m	N/A	980.9062 u
CT2	165.3221 u	N/A	168.5356 u
CT3	32.4158 m	N/A	2.5381
CT4	1.3579	N/A	13.6418 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	9.9324	N/A	5.3124
RF2	28.9353	N/A	16.3119
RF3	19.4955	N/A	14.0691
RF4	51.4401	N/A	4.0773
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	170.1651 u	N/A	105.4782 u
CF2	1.3594 m	N/A	549.2108 u
CF3	32.6863 m	N/A	1.7158 m
CF4	1.3801	N/A	70.8657 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

