

## 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>			
<b>Thermal Resistance (°C/W)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
RT1	5.8210	N/A	4.2414
RT2	36.2964	N/A	7.3652
RT3	20.4596	N/A	16.1924
RT4	47.4231	N/A	12.2011
<b>Thermal Capacitance (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	463.2598 u	N/A	396.7721 u
CT2	61.9294 m	N/A	11.0478 m
CT3	9.1143 m	N/A	88.0234 m
CT4	1.5862	N/A	13.0354 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	6.7606	N/A	4.5901
RF2	26.0771	N/A	12.8657
RF3	34.2383	N/A	9.1553
RF4	42.9239	N/A	13.3888
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	525.1594 $\mu$	N/A	368.0528 $\mu$
CF2	7.6255 m	N/A	4.8439 m
CF3	62.7569 m	N/A	3.9259 m
CF4	1.7987	N/A	96.5679 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

