

## 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	11.5878	N/A	23.4402
RT2	45.4875	N/A	10.9620
RT3	48.3286	N/A	19.4430
RT4	49.5961	N/A	41.1548
<b>Thermal Capacitance (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	260.7413 u	N/A	1.5649 m
CT2	1.3706 m	N/A	214.4767 u
CT3	11.2286 m	N/A	58.1757 m
CT4	1.6583	N/A	2.9908 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	17.0836	N/A	17.5427
RF2	47.3090	N/A	43.3715
RF3	41.2460	N/A	24.0470
RF4	49.3614	N/A	10.0388
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	229.5149 u	N/A	188.2622 u
CF2	1.0029 m	N/A	968.0053 u
CF3	9.9194 m	N/A	5.7792 m
CF4	1.6273	N/A	160.3470 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

