

## R-C Thermal Model Parameters

### DESCRIPTION

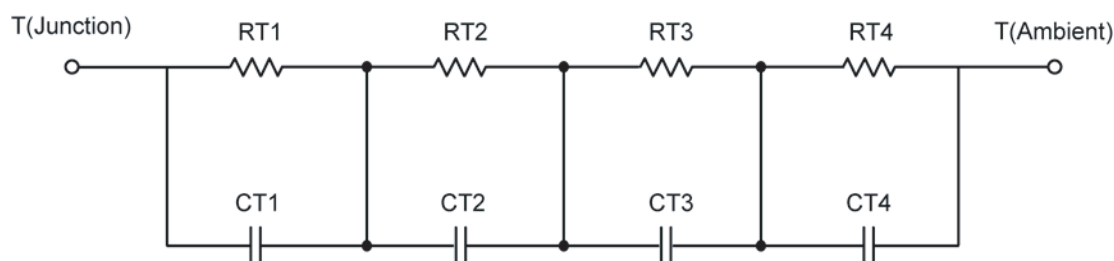
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse 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:*

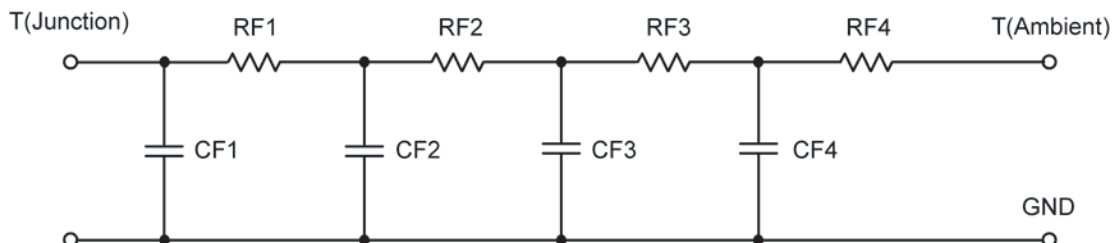
*For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).*

### R-C THERMAL MODEL FOR TANK CONFIGURATION



<b>R-C VALUES FOR TANK CONFIGURATION</b>					
Thermal Resistance (°C/W)					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
RT1	30.1975	19.0317	N/A	11.4489	10.8612
RT2	8.3530	7.7577	N/A	3.8410	1.9400
RT3	18.4271	27.4635	N/A	10.5686	10.6540
RT4	62.9203	55.2920	N/A	6.2115	6.6268
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
CT1	41.2307 m	12.5425 m	N/A	6.7258 m	6.4312 m
CT2	903.4913 u	2.8727 m	N/A	672.1725 u	888.8493 u
CT3	21.6919 m	51.0766 m	N/A	62.6461 m	33.7175 m
CT4	1.0988	1.1785	N/A	314.2587 m	412.9533 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 Nch	Ambient Pch	Case	Foot Nch	Foot Pch
RF1	10.1617	8.5596	N/A	4.7348	4.4306
RF2	32.6061	33.1975	N/A	13.7295	16.4030
RF3	17.4742	17.8116	N/A	9.4271	5.2435
RF4	59.5756	50.2002	N/A	4.0459	3.7900
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
CF1	966.0238 u	1.4090 m	N/A	636.8346 u	1.5704 m
CF2	13.2845 m	8.7029 m	N/A	5.4097 m	5.6339 m
CF3	53.3988 m	130.1823 m	N/A	64.5661 m	161.0177 m
CF4	1.1056	1.1716	N/A	7.9990 m	12.5709 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

