

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



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	57.3385	N/A	23.3961
RT2	11.3186	N/A	5.5170
RT3	22.2496	N/A	1.5526
RT4	29.0933	N/A	9.5343
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.2687	N/A	972.5905 μ
CT2	256.3404 μ	N/A	171.7277 μ
CT3	31.6376 m	N/A	1.3394
CT4	1.7862 m	N/A	13.1827 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	11.3931	N/A	9.1707
RF2	33.3620	N/A	18.3070
RF3	19.5536	N/A	10.3585
RF4	55.6913	N/A	2.1638
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	158.9536 u	N/A	162.5999 u
CF2	1.3866 m	N/A	822.9837 u
CF3	42.9674 m	N/A	4.4936 m
CF4	1.2573	N/A	543.2878 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

