

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	17.7264	N/A	15.7415
RT2	2.6324	N/A	2.2019
RT3	34.7338	N/A	15.5514
RT4	54.4627	N/A	6.8595
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	4.9531 m	N/A	4.7655 m
CT2	8.9425 m	N/A	426.8169 u
CT3	45.8398 m	N/A	105.9687 m
CT4	1.0431	N/A	89.5748 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	9.9712	N/A	2.8820
RF2	21.3197	N/A	18.2884
RF3	29.0574	N/A	8.7076
RF4	49.2614	N/A	10.4393
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	2.2098 m	N/A	476.9172 u
CF2	6.5082 m	N/A	4.1262 m
CF3	61.9906 m	N/A	43.2595 m
CF4	1.0971	N/A	69.3897 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

