

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	19.5023	N/A	5.7401
RT2	23.8152	N/A	683.1000 m
RT3	9.4114	N/A	6.1598
RT4	27.2711	N/A	5.4170
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	79.0920 m	N/A	13.4159 m
CT2	1.8166	N/A	3.4540 m
CT3	10.9944 m	N/A	325.9870 m
CT4	3.8068	N/A	68.9450 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	5.9804	N/A	1.2845
RF2	17.7285	N/A	6.9027
RF3	15.1728	N/A	4.5092
RF4	41.1183	N/A	5.3036
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	4.9914 m	N/A	2.8583 m
CF2	28.6913 m	N/A	7.8992 m
CF3	305.1750 m	N/A	41.2871 m
CF4	1.4986	N/A	269.4138 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

