

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	14.1804	N/A	8.9352
RT2	4.1840	N/A	1.5267
RT3	23.0939	N/A	2.3889
RT4	43.5417	N/A	8.1492
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	25.8739 m	N/A	8.9395 m
CT2	2.7648 m	N/A	612.8259 u
CT3	121.6189 m	N/A	1.3469
CT4	2.0345	N/A	120.2485 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	4.6374	N/A	1.5331
RF2	19.7642	N/A	9.7469
RF3	20.2528	N/A	7.2795
RF4	40.3456	N/A	2.4405
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	1.9650 m	N/A	524.9641 u
CF2	18.0984 m	N/A	7.2006 m
CF3	124.0060 m	N/A	92.2570 m
CF4	2.0405	N/A	720.1278 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

