

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	5.8414	N/A	6.8650
RT2	20.6869	N/A	1.5343
RT3	24.1966	N/A	5.4651
RT4	34.2751	N/A	7.1356
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	10.8313 m	N/A	11.7441 m
CT2	1.7695	N/A	10.3888 m
CT3	48.3561 m	N/A	556.0452 m
CT4	2.8676	N/A	138.3595 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	10.6784	N/A	4.4388
RF2	22.0835	N/A	4.2829
RF3	33.2621	N/A	6.3940
RF4	18.9760	N/A	5.8843
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	10.7907 m	N/A	4.3434 m
CF2	48.9692 m	N/A	9.1466 m
CF3	1.0453	N/A	59.5960 m
CF4	2.4536	N/A	284.0248 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

