

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	9.8655	N/A	1.6562
RT2	18.7482	N/A	4.6859
RT3	14.8777	N/A	7.7472
RT4	51.5087	N/A	5.9108
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	838.5909 u	N/A	768.8431 u
CT2	69.4324 m	N/A	5.6388 m
CT3	8.2041 m	N/A	2.0367 m
CT4	1.3912	N/A	38.5481 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	14.7646	N/A	7.5300
RF2	22.4488	N/A	9.3619
RF3	16.9248	N/A	1.1457
RF4	40.8617	N/A	1.9626
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	874.2373 u	N/A	649.1740 u
CF2	13.9572 m	N/A	2.9366 m
CF3	405.2672 m	N/A	92.0200 m
CF4	1.3986	N/A	41.1707 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

