

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-SPIICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPIICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	27.0649	N/A	19.0930
RT2	25.9226	N/A	15.9337
RT3	7.7216	N/A	3.4662
RT4	49.2909	N/A	6.5071
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	7.6418 m	N/A	48.4816 m
CT2	104.4942 m	N/A	6.7573 m
CT3	362.7486 u	N/A	137.0604 u
CT4	1.8965	N/A	1.9636 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	9.5029	N/A	5.0442
RF2	30.0367	N/A	13.6446
RF3	25.2253	N/A	17.4983
RF4	45.2351	N/A	8.8129
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	415.3397 u	N/A	156.3599 u
CF2	7.4217 m	N/A	1.9461 m
CF3	113.7864 m	N/A	10.5641 m
CF4	1.9996	N/A	137.5572 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

