

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	7.0758	N/A	7.5020
RT2	17.0370	N/A	897.3355 m
RT3	17.4688	N/A	4.7711
RT4	38.1489	N/A	2.8545
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	19.3780 m	N/A	133.8260 m
CT2	2.0410	N/A	66.9080 m
CT3	87.3563 m	N/A	16.5866 m
CT4	2.9754	N/A	1.6241

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	7.3547	N/A	979.6962 m
RF2	18.0073	N/A	5.5894
RF3	17.9905	N/A	4.3890
RF4	35.8741	N/A	4.9596
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	14.1504 m	N/A	6.9088 m
CF2	48.5475 m	N/A	7.2628 m
CF3	824.9106 m	N/A	81.9651 m
CF4	1.4196	N/A	260.4108 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

