

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	9.7405	N/A	9.3699
RT2	23.4561	N/A	1.9356
RT3	25.1299	N/A	9.1739
RT4	51.6735	N/A	9.5206
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.7016 m	N/A	39.9518 m
CT2	29.8526 m	N/A	338.4235 u
CT3	11.4701 m	N/A	6.5793 m
CT4	1.2748	N/A	6.3393 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	10.9186	N/A	2.3663
RF2	28.7221	N/A	19.3306
RF3	19.7446	N/A	6.3032
RF4	50.6147	N/A	1.9999
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	1.2069 m	N/A	346.5461 u
CF2	5.3045 m	N/A	2.5676 m
CF3	17.4916 m	N/A	22.0873 m
CF4	1.2645	N/A	141.3338 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

