

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	18.0498	N/A	22.8576
RT2	13.5465	N/A	6.8294
RT3	37.3879	N/A	6.2761
RT4	56.0158	N/A	9.0369
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	125.7013 m	N/A	1.4095 m
CT2	416.1167 u	N/A	171.5347 u
CT3	3.9056 m	N/A	262.5130 m
CT4	1.5600	N/A	11.4353 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	15.6843	N/A	5.3345
RF2	36.9662	N/A	5.7488
RF3	19.0906	N/A	26.8876
RF4	53.2589	N/A	7.0291
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	355.8772 u	N/A	110.7145 u
CF2	3.3564 m	N/A	352.3051 u
CF3	114.8704 m	N/A	1.0915 m
CF4	1.5240	N/A	168.0905 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

