

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	8.8461	N/A	10.8672
RT2	25.0529	N/A	3.6759
RT3	19.4730	N/A	7.0627
RT4	56.6281	N/A	14.3943
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.2453 m	N/A	3.9413 m
CT2	7.5257 m	N/A	451.8679 u
CT3	55.7796 m	N/A	49.3097 m
CT4	1.3809	N/A	7.0869 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	8.2187	N/A	5.3416
RF2	25.0932	N/A	18.3833
RF3	20.8896	N/A	10.5917
RF4	55.7985	N/A	1.6834
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	796.1489 u	N/A	460.4257 u
CF2	3.8379 m	N/A	1.8067 m
CF3	30.4567 m	N/A	9.9346 m
CF4	1.3343	N/A	122.9559 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

