

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	6.3259	N/A	1.2118
RT2	18.7381	N/A	4.3804
RT3	13.7578	N/A	14.2755
RT4	51.2285	N/A	10.3800
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	4.2669 m	N/A	749.6739 μ
CT2	104.5621 m	N/A	36.0887 m
CT3	25.9613 m	N/A	106.4651 m
CT4	1.3400	N/A	7.0772 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	7.5550	N/A	1.3324
RF2	18.5206	N/A	11.7068
RF3	16.1877	N/A	6.4286
RF4	47.8861	N/A	10.7164
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	3.2457 m	N/A	495.0417 u
CF2	15.1361 m	N/A	4.5698 m
CF3	105.6361 m	N/A	16.5967 m
CF4	1.3111	N/A	125.2612 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

