

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	21.9438	N/A	6.1149
RT2	15.6302	N/A	513.4000 m
RT3	29.5890	N/A	9.1506
RT4	52.8370	N/A	6.2211
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	7.3224 m	N/A	6.8249 m
CT2	3.7009 m	N/A	88.2535 u
CT3	58.1939 m	N/A	4.5171 m
CT4	1.4508	N/A	6.6050 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	16.6694	N/A	1.5909
RF2	29.3933	N/A	9.3865
RF3	25.0157	N/A	8.6334
RF4	48.9216	N/A	2.3892
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	1.6473 m	N/A	725.9396 u
CF2	4.1504 m	N/A	1.2042 m
CF3	78.9981 m	N/A	264.9627 u
CF4	1.5013	N/A	93.4503 u

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

