

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	54.0598	N/A	48.1248
RT2	15.8142	N/A	12.9565
RT3	71.2893	N/A	8.6500
RT4	77.3114	N/A	30.4849
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.2439	N/A	592.9211 u
CT2	44.4702 u	N/A	49.6255 u
CT3	8.4208 m	N/A	265.2869 m
CT4	624.4212 u	N/A	2.9450 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	19.1328	N/A	15.0822
RF2	84.2059	N/A	69.9790
RF3	61.9466	N/A	139.7063 m
RF4	53.2796	N/A	14.3211
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	46.5958 μ	N/A	38.5497 μ
CF2	535.21943 μ	N/A	484.6505 μ
CF3	8.8692 m	N/A	22.0312 m
CF4	1.2326	N/A	24.2801 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

