

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	4.2360	N/A	8.8222
RT2	23.1091	N/A	8.3346
RT3	10.7927	N/A	6.3964
RT4	51.8622	N/A	1.4468
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	1.7697 m	N/A	188.4095 m
CT2	76.4367 m	N/A	26.9507 m
CT3	30.8322 m	N/A	9.6798 m
CT4	1.2462	N/A	1.4592 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	7.0404	N/A	1.2758
RF2	30.5486	N/A	8.0257
RF3	36.0109	N/A	8.4925
RF4	16.4001	N/A	7.2060
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	2.3510 m	N/A	868.6215 u
CF2	32.3812 m	N/A	4.3125 m
CF3	928.7569 m	N/A	13.9642 m
CF4	2.7834	N/A	186.2520 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

