

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	26.1274	N/A	11.4456
RT2	5.6729	N/A	4.2182
RT3	31.1718	N/A	11.2502
RT4	46.7161	N/A	9.0738
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	4.7983 m	N/A	4.1756 m
CT2	495.1801 u	N/A	417.2003 u
CT3	28.1959 m	N/A	28.1384 m
CT4	1.3870	N/A	11.7678 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	6.2752	N/A	5.2971
RF2	33.8666	N/A	13.6266
RF3	24.1175	N/A	10.9284
RF4	45.0345	N/A	6.1435
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	383.9537 μ	N/A	358.4939 μ
CF2	3.5344 m	N/A	2.1950 m
CF3	29.7924 m	N/A	3.4730 m
CF4	1.3860	N/A	37.2715 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

