

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	20.0665	N/A	33.7863
RT2	54.8145	N/A	10.2039
RT3	31.1477	N/A	19.1611
RT4	43.1457	N/A	27.1347
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	373.6987 μ	N/A	1.2515 m
CT2	2.3832 m	N/A	167.2430 μ
CT3	40.8800 m	N/A	74.6540 m
CT4	1.6341	N/A	5.5636 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	28.3858	N/A	14.5540
RF2	50.7652	N/A	38.2709
RF3	27.9572	N/A	16.1884
RF4	42.2730	N/A	20.2465
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	330.5508 u	N/A	176.8283 u
CF2	2.1458 m	N/A	835.5003 u
CF3	35.5561 m	N/A	2.8881 m
CF4	1.6112	N/A	36.6223 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

