

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-SPIICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPIICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	21.1902	N/A	3.8442
RT2	15.0819	N/A	273.1000 m
RT3	30.3726	N/A	6.1675
RT4	53.3553	N/A	4.7152
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	16.4995 m	N/A	14.2753 m
CT2	8.0002 m	N/A	183.2963 u
CT3	88.9361 m	N/A	8.6158 m
CT4	1.3664	N/A	12.1280 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	15.7372	N/A	997.0218 m
RF2	29.1523	N/A	7.3776
RF3	25.5399	N/A	5.6411
RF4	49.5706	N/A	984.2782 m
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	3.8053 m	N/A	1.6172 m
CF2	7.2013 m	N/A	2.0515 m
CF3	112.8131 m	N/A	733.0584 u
CF4	1.2889	N/A	6.8487 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

