

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 Ch1	Ambient Ch2	Foot	Case Ch1	Case Ch2
RT1	29.1249	29.1249	N/A	12.4930 u	12.4930 u
RT2	6.9670	6.9670	N/A	7.8166	7.8166
RT3	18.5813	18.5813	N/A	3.8770	3.8770
RT4	50.1264	50.1264	N/A	3.3831	3.3831
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Ch1	Ambient Ch2	Foot	Case Ch1	Case Ch2
CT1	4.5843 m	4.5843 m	N/A	3.3132 u	3.3132 u
CT2	283.6337 u	283.6339 u	N/A	2.6715 m	2.6715 m
CT3	107.8785 m	107.8774 m	N/A	164.1373 u	164.1373 u
CT4	1.5756	1.5756	N/A	3.3150 m	3.3150 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 (°C/W)					
Junction to	Ambient Ch1	Ambient Ch2	Foot	Case Ch1	Case Ch2
RF1	9.3413	9.3413	N/A	5.5864	5.5864
RF2	29.9229	29.9229	N/A	2.3591	2.3591
RF3	18.5687	18.5687	N/A	6.5605	6.5605
RF4	47.0389	47.0389	N/A	511.4712 m	511.4712 m
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Ch1	Ambient Ch2	Foot	Case Ch1	Case Ch2
CF1	356.4665 u	356.4659 u	N/A	174.6616 u	174.6616 u
CF2	4.6000 m	4.6000 m	N/A	1.8003 m	1.8003 m
CF3	116.2235 m	116.2234 m	N/A	183.9506 u	183.9506 u
CF4	1.5853	1.5853	N/A	5.4784 m	5.4784 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



