

R-C Thermal Model Parameters

DESCRIPTION

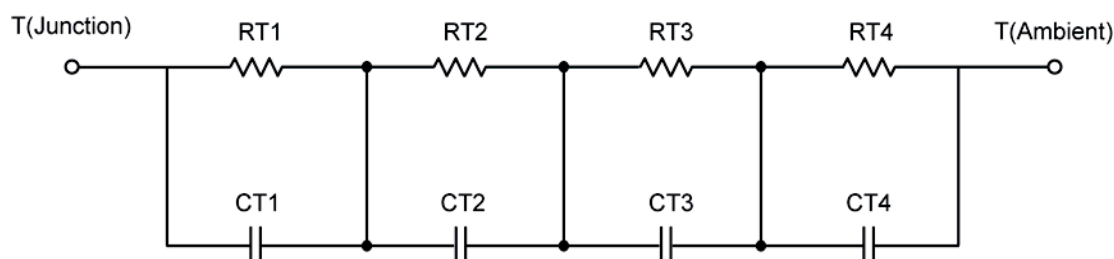
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse 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:

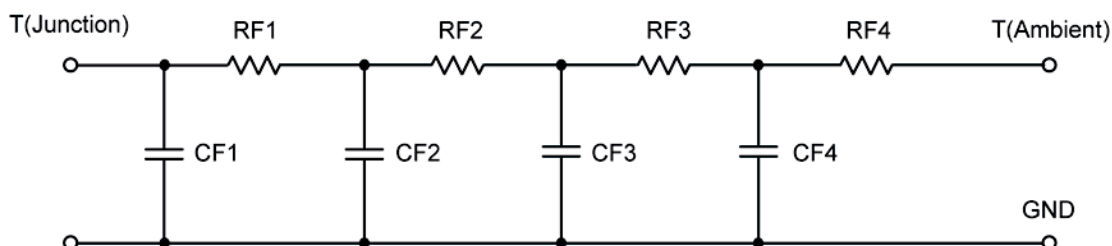
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	Ambient Nch	Ambient Pch	Foot	Case Nch	Case Pch
RT1	2.7032	2.7032	N/A	2.1126	1.8456
RT2	56.3711	56.3711	N/A	289.1000 m	228.6000 m
RT3	10.0561	10.0561	N/A	1.1557	1.0046
RT4	15.8696	15.8696	N/A	1.6426	1.2212
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Nch	Ambient Pch	Foot	Case Nch	Case Pch
CT1	1.6400 m	1.6400 m	N/A	774.3999 u	740.1442 u
CT2	1.2524	1.2524	N/A	1.7140 m	19.4319 m
CT3	16.8152 m	16.8152 m	N/A	177.1961 m	198.9611 m
CT4	185.9933 m	185.9933 m	N/A	7.2563 m	9.0791 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 Nch	Ambient Pch	Foot	Case Nch	Case Pch
RF1	3.6621	3.6621	N/A	2.3331	2.1656
RF2	11.7854	11.7854	N/A	1.7307	1.2361
RF3	19.2138	19.2138	N/A	1.0257	872.9618 m
RF4	50.3387	50.3387	N/A	110.5000 m	25.3382 m
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Nch	Ambient Pch	Foot	Case Nch	Case Pch
CF1	1.7443 m	1.7443 m	N/A	498.1549 u	646.4018 u
CF2	15.6266 m	15.6266 m	N/A	3.6677 m	7.2903 m
CF3	174.0794 m	174.0794 m	N/A	156.6513 m	191.3531 m
CF4	1.2073	1.2073	N/A	980.1945 m	1.9190

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

