

R-C Thermal Model Parameters

DESCRIPTION

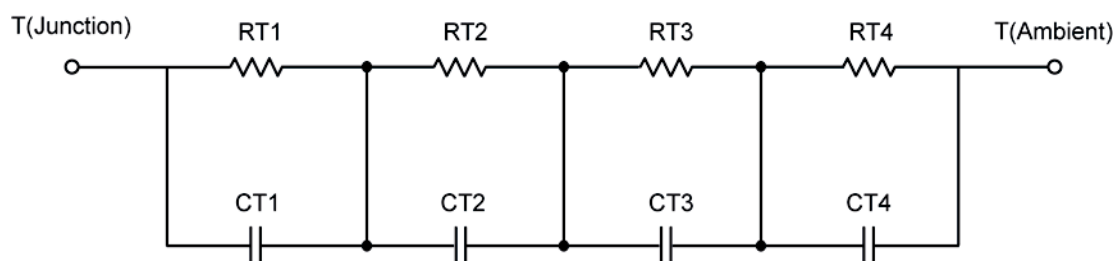
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

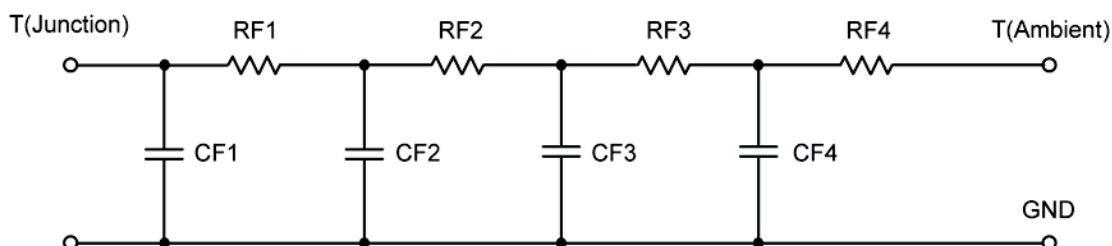
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
RT1	12.1637	14.9494	N/A	5.7765	6.5467
RT2	25.6565	19.0021	N/A	3.7748	4.3575
RT3	27.9663	20.0917	N/A	2.3175	2.8124
RT4	44.2135	55.9568	N/A	4.1312	4.7834
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
CT1	90.4043 u	44.0775 u	N/A	534.8325 u	389.0875 u
CT2	1.8276 m	1.4083 m	N/A	89.9295 u	49.6774 u
CT3	26.2170 m	32.5737 m	N/A	148.7090 u	51.6465 u
CT4	1.0557	1.4670	N/A	411.8908 u	227.5644 u

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 Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
RF1	16.6834	15.8821	N/A	8.7745	9.2052
RF2	31.9645	21.5723	N/A	3.8432	5.5541
RF3	21.7849	16.8410	N/A	1.7466	2.1892
RF4	39.5672	55.7046	N/A	1.6357	1.5515
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
CF1	112.9573 u	42.3590 u	N/A	45.4623 u	23.0729 u
CF2	2.6995 m	1.4701 m	N/A	196.9465 u	93.1985 u
CF3	63.9442 m	41.2699 m	N/A	383.0379 u	538.7457 u
CF4	1.2074	1.3812	N/A	98.0442 u	942.4790 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

