

R-C Thermal Model Parameters

DESCRIPTION

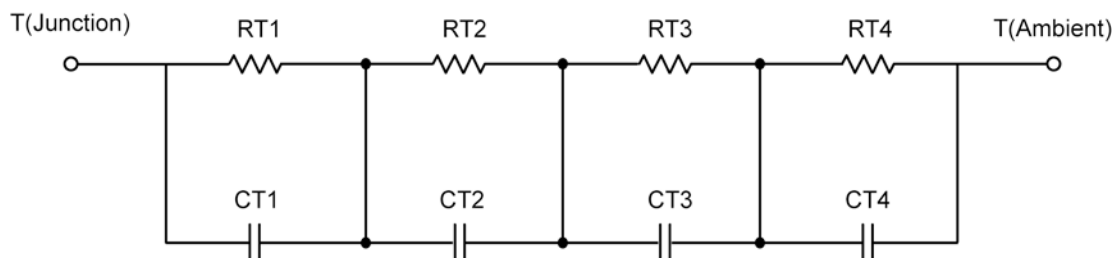
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

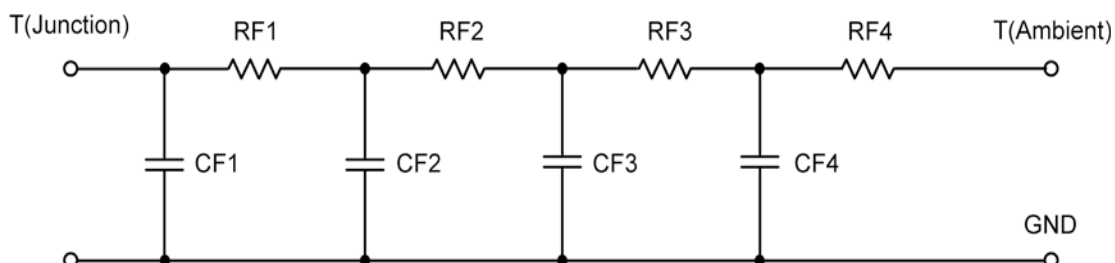
For a detailed explanation of implementing these values in P-SPIICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPIICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
RT1	28.2299	13.2141	N/A	2.2722	5.3471
RT2	13.6699	15.5933	N/A	2.0701	1.7427
RT3	25.0926	16.7952	N/A	9.3065	3.9683
RT4	43.0076	39.3974	N/A	2.3512	5.9419
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
CT1	2.2902 m	53.2786 u	N/A	1.3976 m	745.9934 u
CT2	103.0879 u	1.2006 m	N/A	56.1708 u	50.2230 u
CT3	41.0625 m	28.3033 m	N/A	110.4543 u	209.3649 u
CT4	1.1333	894.4606 m	N/A	1.5513 m	1.7658 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 Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
RF1	14.2316	16.7469	N/A	8.7935	5.7550
RF2	31.2017	17.1679	N/A	3.8630	7.7276
RF3	23.4768	14.6943	N/A	1.7348	1.9243
RF4	41.0899	36.3909	N/A	1.6087	1.5931
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Foot	Case Mosfet	Case Schottky
CF1	92.0097 u	61.1928 u	N/A	44.6639 u	53.3243 u
CF2	2.0230 m	2.1028 m	N/A	233.0753 u	369.2262 u
CF3	43.4126 m	59.4980 m	N/A	111.8383 u	829.0503 u
CF4	1.1315	945.9847 m	N/A	532.2817 u	9.9427 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

