

R-C Thermal Model Parameters

DESCRIPTION

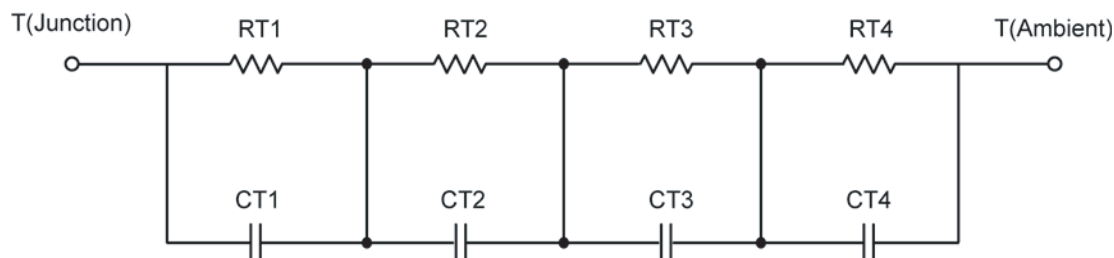
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in ["A Simple Method of Generating Thermal Models for a Power MOSFET"](#)[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

R-C values for the electrical circuit in the Foster/Tank configuration are included. The corresponding values for the Cauer/Filter configuration are available upon request.

Note:

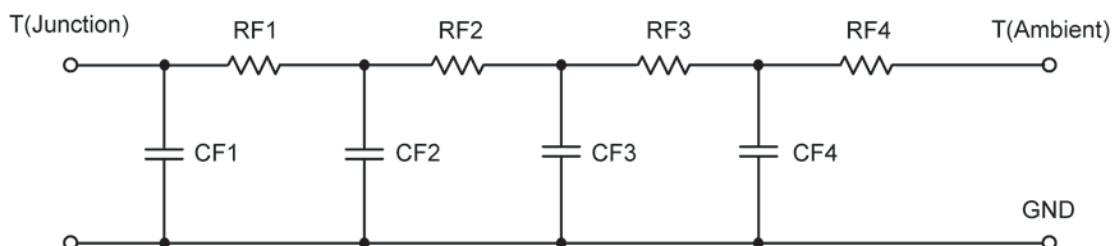
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION				
Thermal Resistance (°C/W)				
Junction to	Ambient Nch	Ambient Pch	Foot Nch	Foot Pch
RT1	4.7482	5.5438	22.4222	14.3514
RT2	31.8893	27.4562	3.2787	2.9295
RT3	24.3920	21.8476	973.3628 m	3.4228
RT4	58.9998	54.1676	18.1068	20.7505
Thermal Capacitance (Joules/°C)				
Junction to	Ambient Nch	Ambient Pch	Foot Nch	Foot Pch
CT1	311.8705 μ	970.9373 μ	41.7746 m	75.5235 m
CT2	62.5050 m	69.1436 m	292.0507 μ	341.4978 μ
CT3	8.4858 m	7.7368 m	860.0414 μ	4.8972 m
CT4	1.3320	1.3062	3.8677 m	4.5394 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 Nch	Foot Pch
RF1	5.9479	9.5391	4.7274	4.4970
RF2	28.7689	25.8218	19.1645	22.6317
RF3	29.2412	23.7797	13.0947	9.7061
RF4	56.0376	49.9842	8.1456	4.5158
Thermal Capacitance (Joules/°C)				
Junction to	Ambient	Ambient	Foot	Foot
CF1	434.8043 μ	1.1713 m	213.5880 μ	343.6486 μ
CF2	7.2483 m	7.8256 m	3.2062 m	2.7590 m
CF3	53.9569 m	90.0739 m	25.5973 m	58.3175 m
CF4	1.3254	1.3423	121.4973 m	30.3715 μ

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

