

R-C Thermal Model Parameters

DESCRIPTION

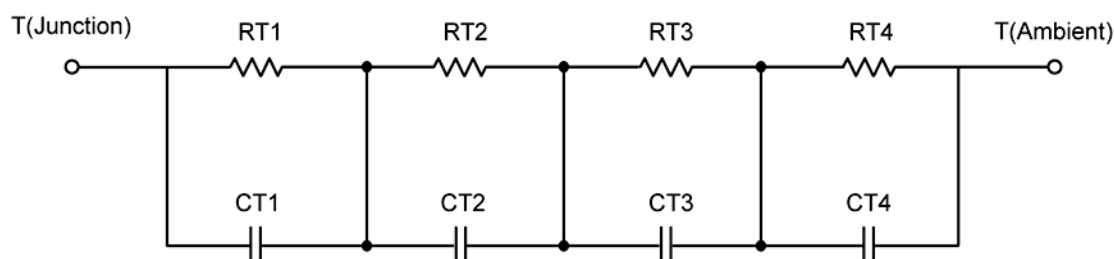
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

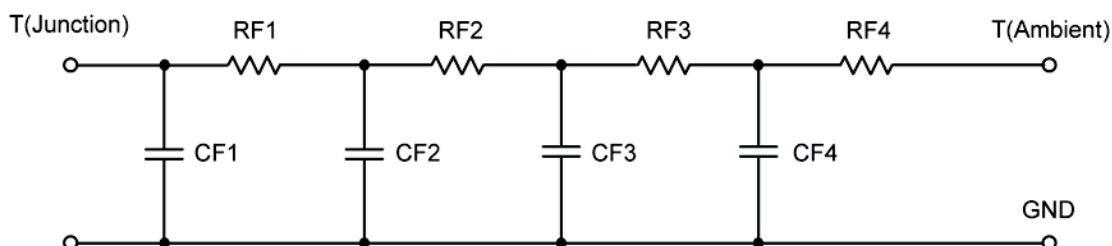
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	Ambient Mosfet	Ambient Schottky	Case	Foot Mosfet	Foot Schottky
RT1	41.3839	50.5349	N/A	29.1228	29.3755
RT2	17.8424	18.1012	N/A	22.7539	22.6128
RT3	45.3883	46.3955	N/A	25.6195	32.7248
RT4	45.3854	49.9684	N/A	12.5038	10.2869
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Case	Foot Mosfet	Foot Schottky
CT1	16.2326 m	11.8607 m	N/A	4.1372 m	2.9802 m
CT2	382.1978 u	309.9788 u	N/A	1.7457 m	1.4990 m
CT3	2.2476 m	1.9009 m	N/A	15.3997 m	13.5018 m
CT4	1.8854	1.7071	N/A	255.9679 u	216.5573 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	Case	Foot Mosfet	Foot Schottky
RF1	22.8768	24.5444	N/A	19.6121	19.9249
RF2	52.3054	54.6038	N/A	49.1762	50.8226
RF3	29.9906	36.8954	N/A	10.9809	12.0196
RF4	44.8272	48.9564	N/A	10.2308	12.2329
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Mosfet	Ambient Schottky	Case	Foot Mosfet	Foot Schottky
CF1	297.9236 u	270.1590 u	N/A	217.3897 u	208.7151 u
CF2	1.7173 m	1.4336 m	N/A	1.2357 m	1.1098 m
CF3	18.6657 m	13.7160 m	N/A	13.1791 m	13.5935 m
CF4	1.8697	1.7442	N/A	3.6092 m	7.4595 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

