R-C Thermal Model Parameters

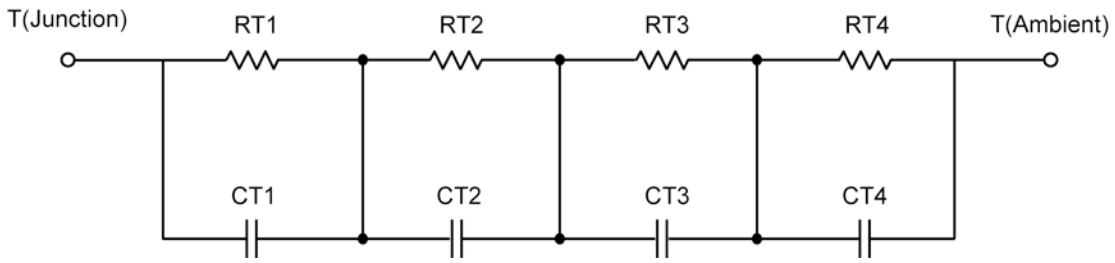
DESCRIPTION

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.

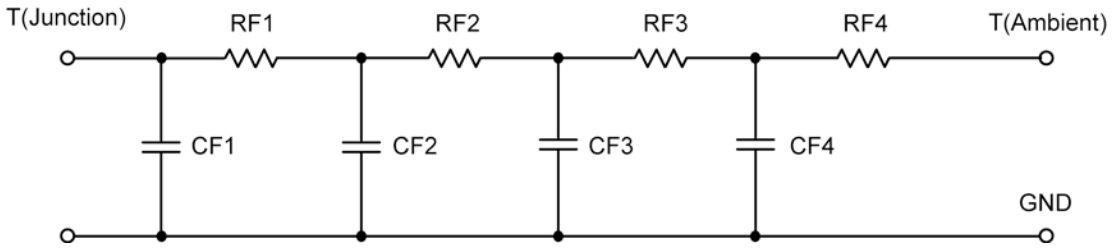
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	155.4023 m	N/A
RT2	N/A	460.1482 m	N/A
RT3	N/A	284.0411 m	N/A
RT4	N/A	200.4084 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	1.7621 m	N/A
CT2	N/A	6.2310 m	N/A
CT3	N/A	15.7188 m	N/A
CT4	N/A	35.2003 m	N/A

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

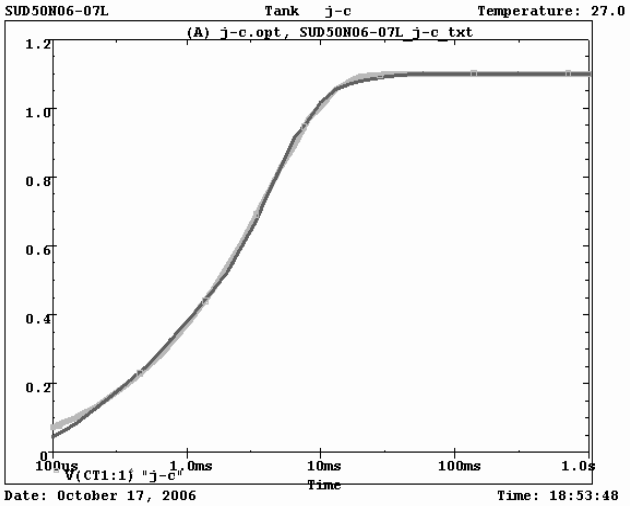


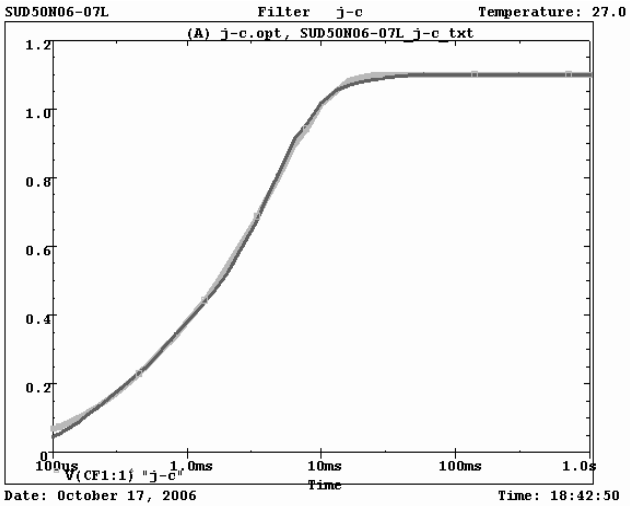
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	394.3166 m	N/A
RF2	N/A	526.5395 m	N/A
RF3	N/A	169.5432 m	N/A
RF4	N/A	9.6007 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	1.3330 m	N/A
CF2	N/A	4.4711 m	N/A
CF3	N/A	2.3116 m	N/A
CF4	N/A	72.2291 m	N/A

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


SUD50N06-07L
Tank j-c
Temperature: 27.0
(A) j-c.opt, SUD50N06-07L_j-c_txt
1.2
1.0
0.8
0.6
0.4
0.2
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1) "j-c"
Time
Date: October 17, 2006
Time: 18:53:48


SUD50N06-07L
Filter j-c
Temperature: 27.0
(A) j-c.opt, SUD50N06-07L_j-c_txt
1.2
1.0
0.8
0.6
0.4
0.2
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1) "j-c"
Time
Date: October 17, 2006
Time: 18:42:50