R-C Thermal Model Parameters

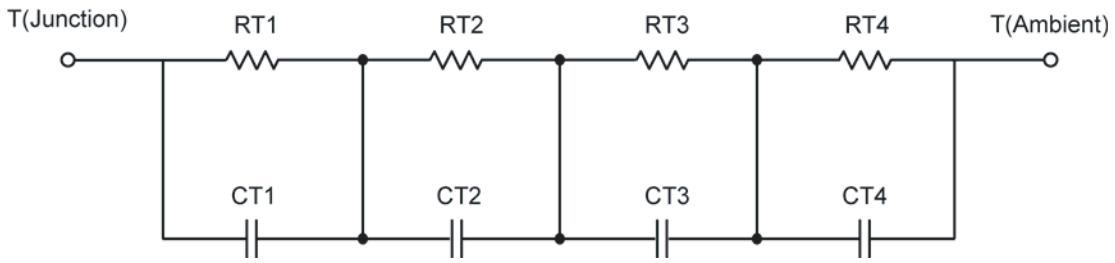
DESCRIPTION

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.

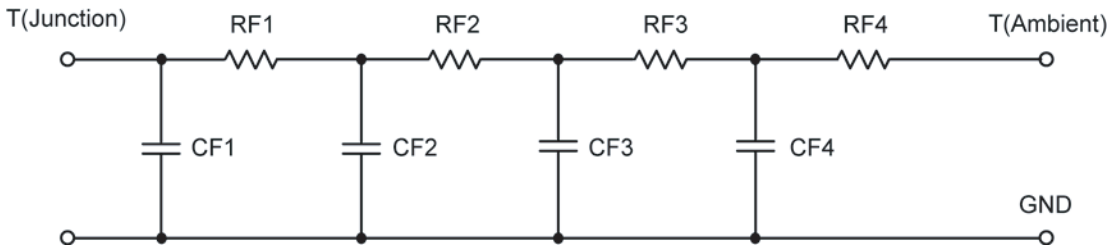
Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION		
Thermal Resistance (°C/W)		
Junction to	**Ambient**	**Case**
RT1	22.1294	N/A
RT2	62.6895	N/A
RT3	65.0980	N/A
RT4	18.6120	N/A
Thermal Capacitance (Joules/°C)		
Junction to	**Ambient**	**Case**
CT1	1.0200 m	N/A
CT2	1.3849	N/A
CT3	5.1769 m	N/A
CT4	200.4528 m	N/A

R-C THERMAL MODEL FOR FILTER CONFIGURATION

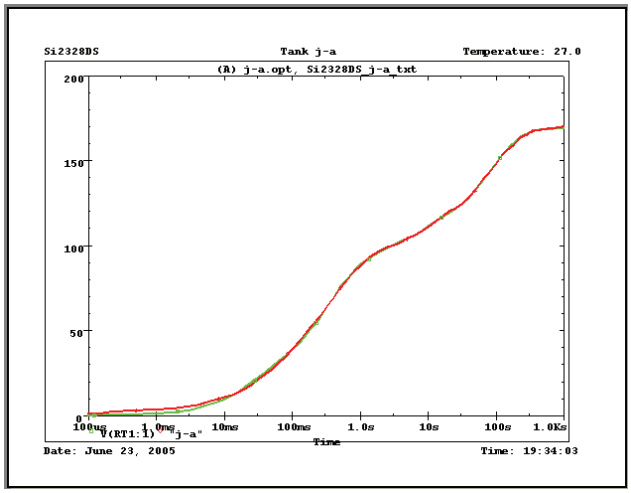


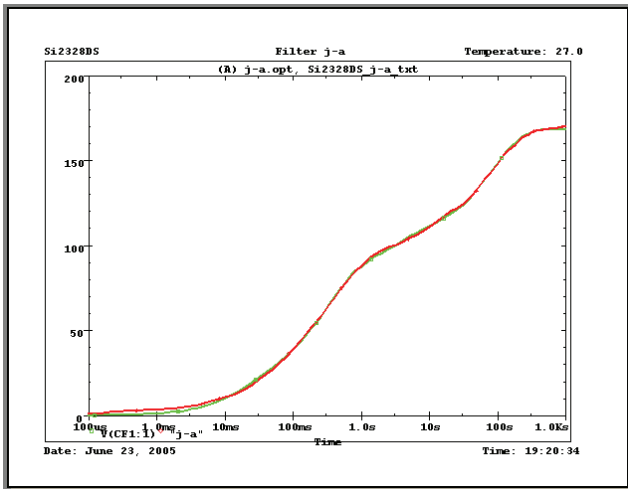
R-C VALUES FOR FILTER CONFIGURATION		
Thermal Resistance (°C/W)		
Junction to	**Ambient**	**Case**
RF1	28.0640	N/A
RF2	58.4501	N/A
RF3	22.4449	N/A
RF4	59.4538	N/A
Thermal Capacitance (Joules/°C)		
Junction to	**Ambient**	**Case**
CF1	780.4517 μ	N/A
CF2	3.9756 m	N/A
CF3	109.9157 m	N/A
CF4	1.3094	N/A

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


Si2328DS
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si2328DS_j-a.txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: June 23, 2005
Time: 19:34:03


Si2328DS
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si2328DS_j-a.txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(CF1:1) "j-a"
Time
Date: June 23, 2005
Time: 19:20:34