R-C Thermal Model Parameters

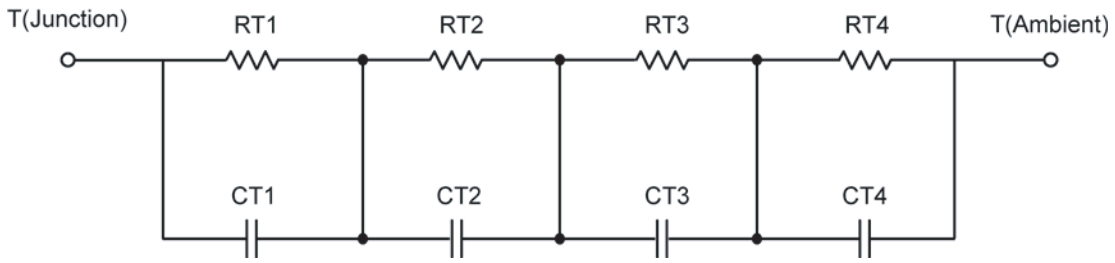
DESCRIPTION

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.

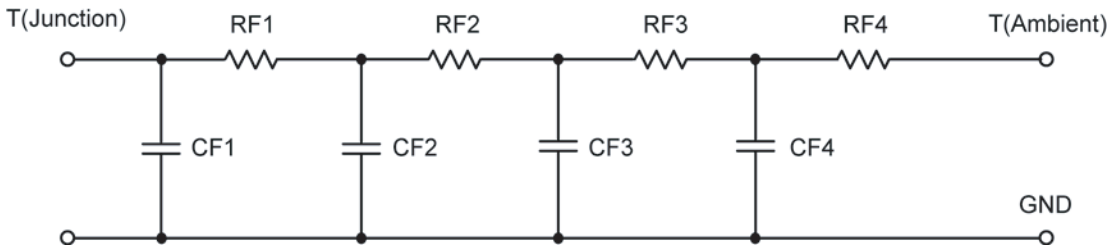
Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.6630	N/A	957.8288 m
RT2	30.4017	N/A	4.6741
RT3	26.1463	N/A	9.2794
RT4	22.6225	N/A	6.1811
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.7474 m	N/A	1.3107 m
CT2	39.7462 m	N/A	112.4465 m
CT3	1.7481	N/A	189.2448 m
CT4	3.4781	N/A	6.4133 m

R-C THERMAL MODEL FOR FILTER CONFIGURATION

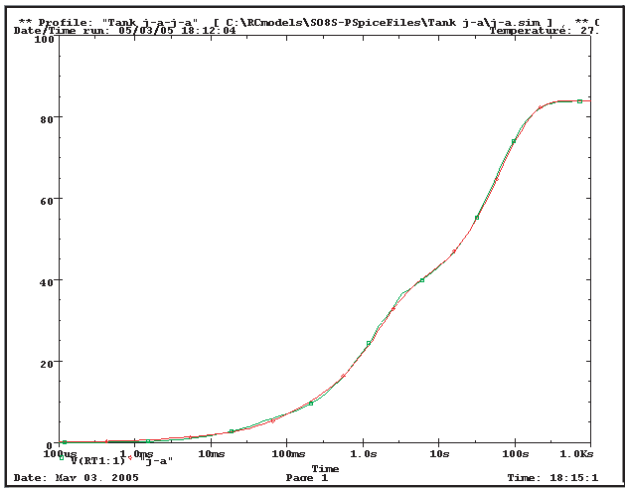


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.6371	N/A	4.1688
RF2	32.4430	N/A	6.1387
RF3	28.4228	N/A	6.3994
RF4	20.5668	N/A	4.2738
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0006 m	N/A	2.4342 m
CF2	29.4484 m	N/A	11.8063 m
CF3	885.1865 m	N/A	111.2368 m
CF4	2.0198	N/A	35.5996 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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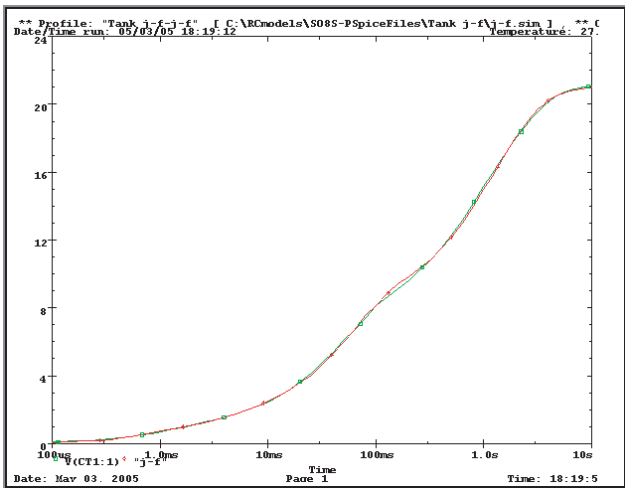
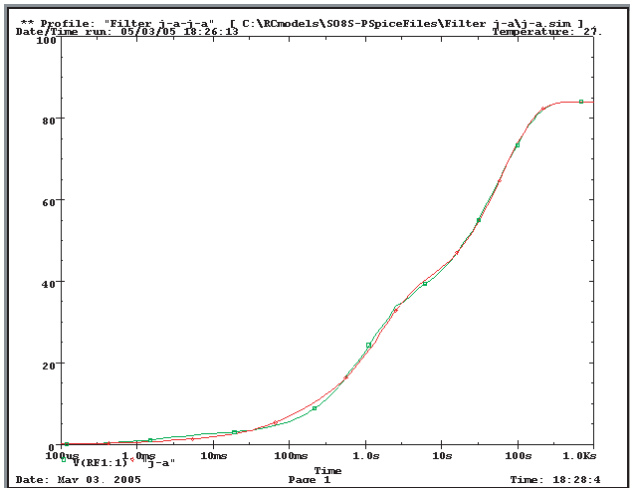
Date/Time run: 05/03/05 18:12:04
Temperature: 27.
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: May 03, 2005
Page 1
Time: 18:15:1


** Profile: "Tank j-f-j-f" [C:\RCmodels\SO8S-PSpiceFiles\Tank j-f\j-f.sim]
Date/Time run: 05/03/05 18:19:12
Temperature: 27.
24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-f"
Time
Date: May 03, 2005
Page 1
Time: 18:19:5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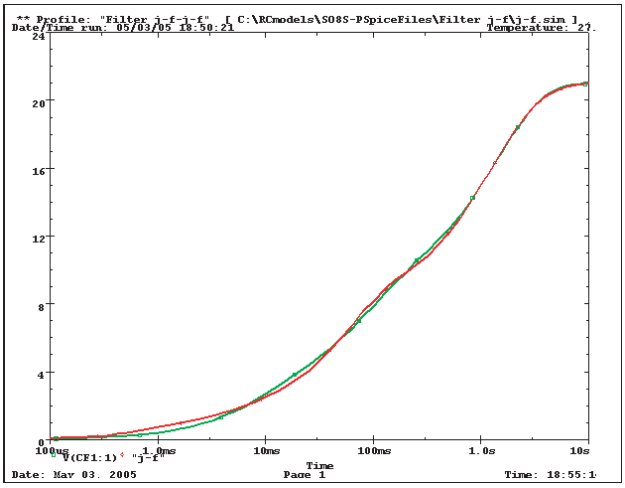
Temperature: 27.
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: May 03, 2005
Page 1
Time: 18:28:4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Date/Time run: 05/03/05 18:50:21
Temperature: 27.
24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: May 03, 2005
Page 1
Time: 18:55:1