R-C Thermal Model Parameters

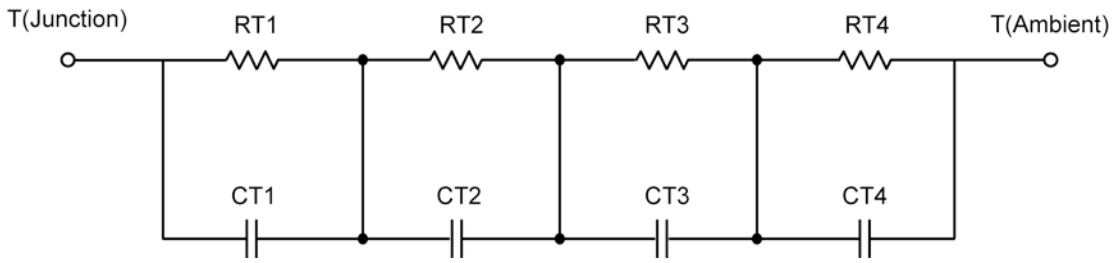
DESCRIPTION

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.

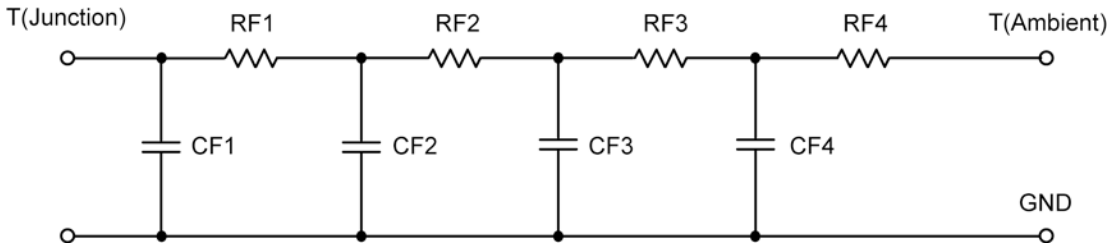
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.2695	N/A	8.8965
RT2	16.7742	N/A	2.1366
RT3	35.9808	N/A	15.5596
RT4	50.9755	N/A	3.4073
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.4694 m	N/A	34.9849 m
CT2	8.2363 m	N/A	338.1620 u
CT3	16.9825 m	N/A	3.2953 m
CT4	1.2106	N/A	66.2415 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

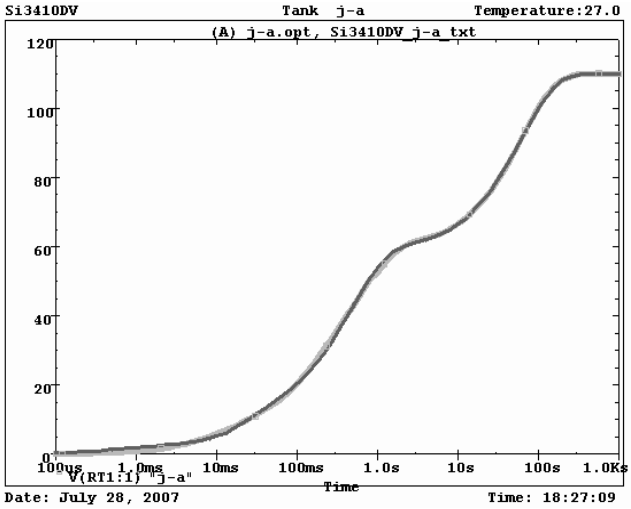


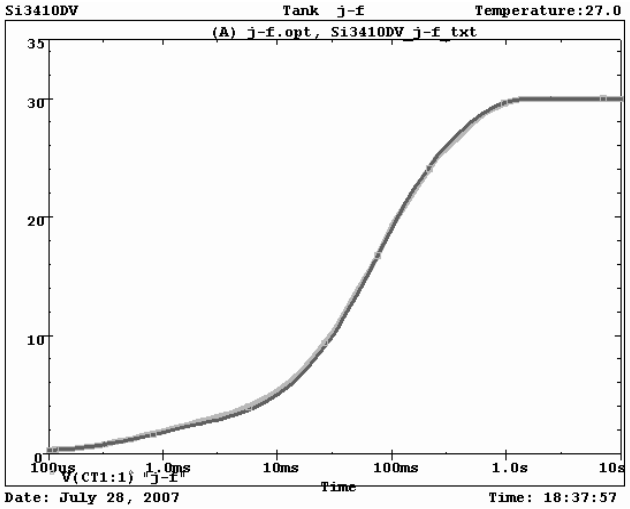
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.5899	N/A	2.2919
RF2	24.7140	N/A	17.9875
RF3	30.5096	N/A	9.3016
RF4	50.1865	N/A	419.0000 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	374.6423 u	N/A	218.9882 u
CF2	3.7124 m	N/A	2.6589 m
CF3	11.1222 m	N/A	17.9020 m
CF4	1.2012	N/A	4.7293

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


Si3410DV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3410DV_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: July 28, 2007
Time: 18:27:09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30
20
10
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100ms
1.0s
10s
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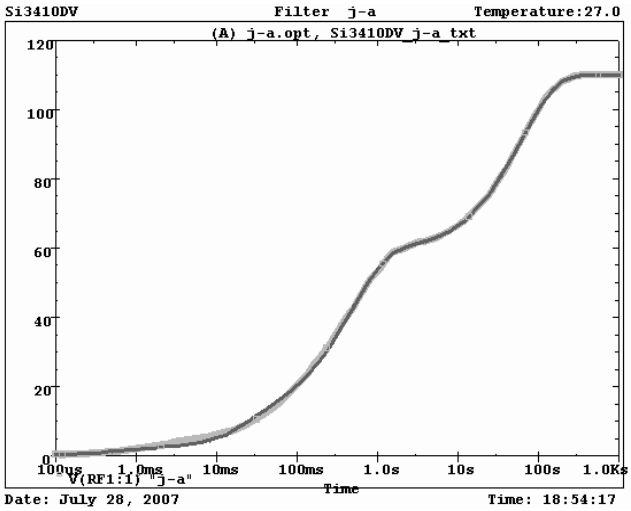
Si3410DV
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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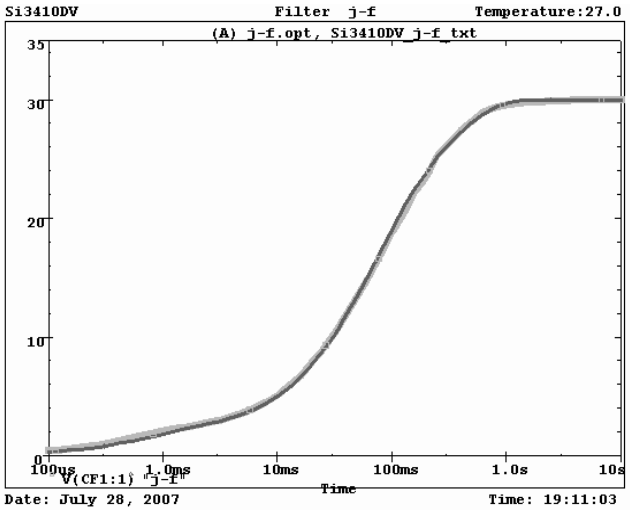
Time
Date: July 28, 2007
Time: 18:54:17


Si3410DV
Filter j-f
Temperature:27.0
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35
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: July 28, 2007
Time: 19:11:03