R-C Thermal Model Parameters

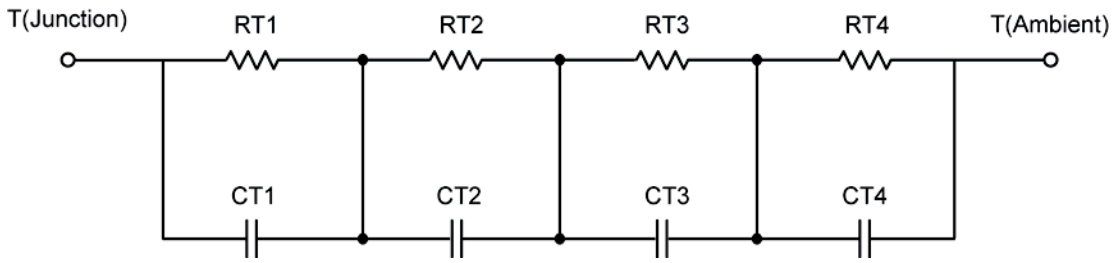
DESCRIPTION

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.

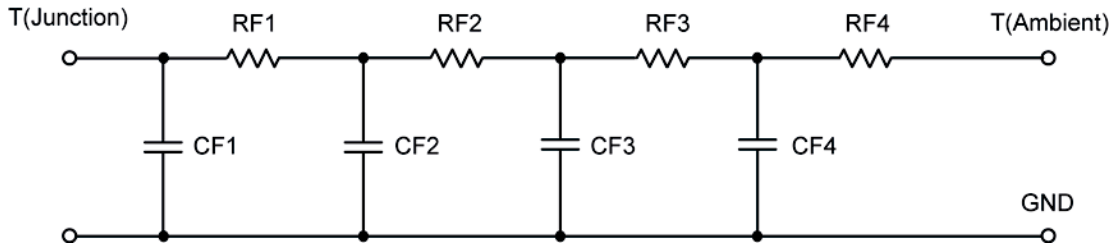
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.2018	N/A	3.4479
RT2	34.4387	N/A	28.6903
RT3	28.5183	N/A	11.0719
RT4	46.8412	N/A	8.7899
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.3490 m	N/A	3.9779 m
CT2	92.4204 m	N/A	25.7830 m
CT3	23.0417 m	N/A	261.0899 m
CT4	3.1340	N/A	19.8255 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

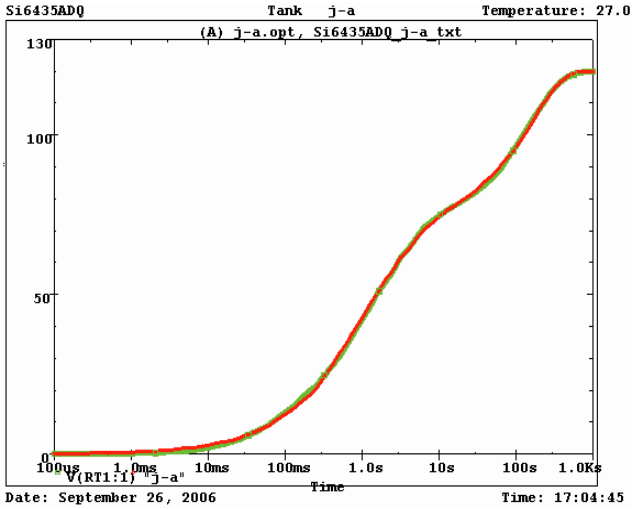


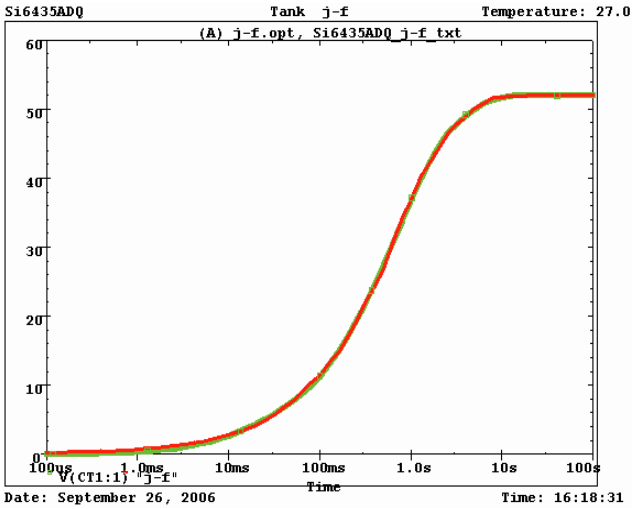
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.8935	N/A	4.5371
RF2	32.9475	N/A	16.3333
RF3	30.3913	N/A	18.1324
RF4	43.7677	N/A	12.9972
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.7265 m	N/A	1.9103 m
CF2	9.0590 m	N/A	8.2810 m
CF3	87.9962 m	N/A	9.9111 m
CF4	3.2260	N/A	103.7602 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


Si6435ADQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6435ADQ_j-a_txt
130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: September 26, 2006
Time: 17:04:45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Tank j-f
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50
40
30
20
10
0
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Time
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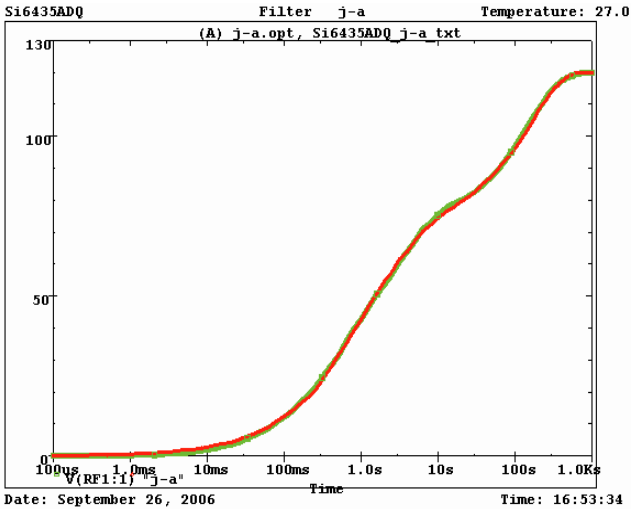
Time: 16:18:31


Si6435ADQ
Filter j-a
Temperature: 27.0
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130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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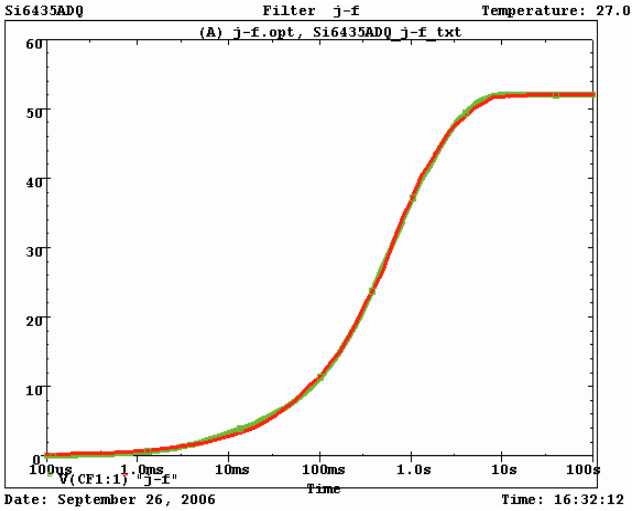
Time
Date: September 26, 2006
Time: 16:53:34


Si6435ADQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6435ADQ_j-f_txt
60
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: September 26, 2006
Time: 16:32:12