R-C Thermal Model Parameters

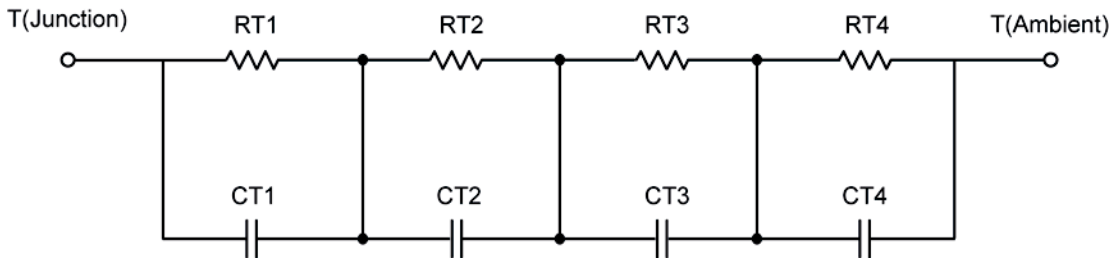
DESCRIPTION

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.

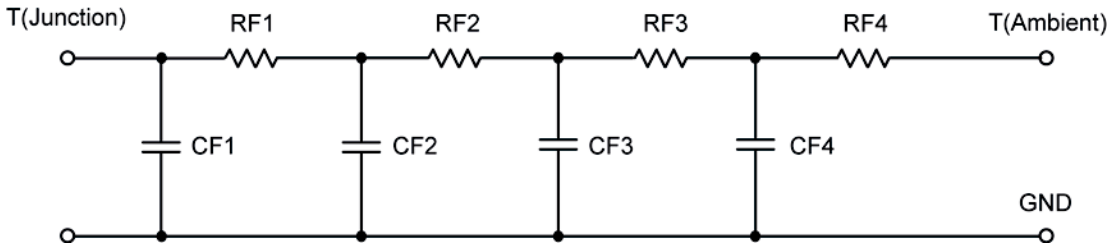
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	20.4738	N/A	28.3561
RT2	6.9831	N/A	14.4611
RT3	73.0256	N/A	34.7407
RT4	49.5175	N/A	2.4421
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	8.1375 m	N/A	15.2183 m
CT2	706.2635 u	N/A	2.7191 m
CT3	15.1800 m	N/A	30.5779 m
CT4	1.5629	N/A	186.6595 u

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

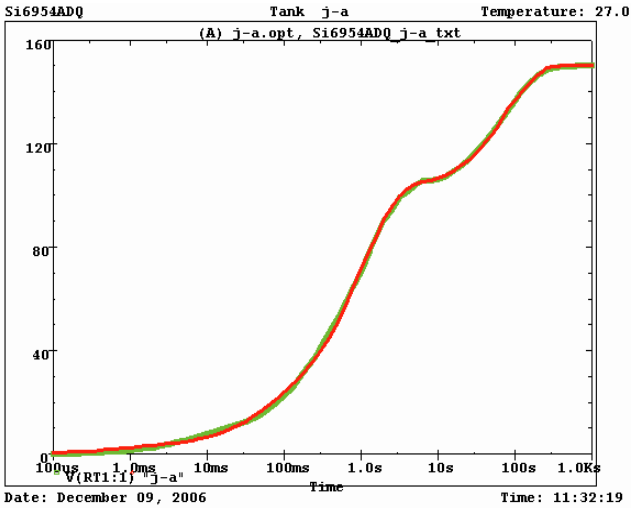


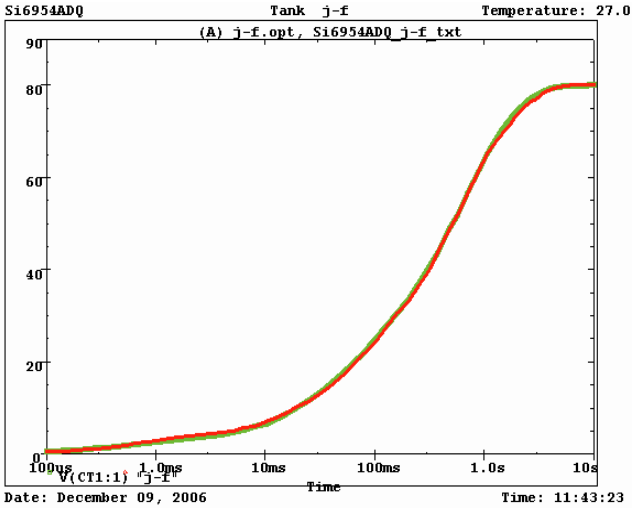
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	17.5867	N/A	4.5385
RF2	40.8814	N/A	21.8045
RF3	43.2753	N/A	33.2166
RF4	48.2566	N/A	20.4404
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.2857 m	N/A	180.0573 u
CF2	7.3415 m	N/A	2.5716 m
CF3	8.6216 m	N/A	7.8195 m
CF4	1.5842	N/A	28.6263 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


Si6954ADQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6954ADQ_j-a_txt
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: December 09, 2006
Time: 11:32:19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Tank j-f
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80
60
40
20
0
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10ms
100ms
1.0s
10s
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Time
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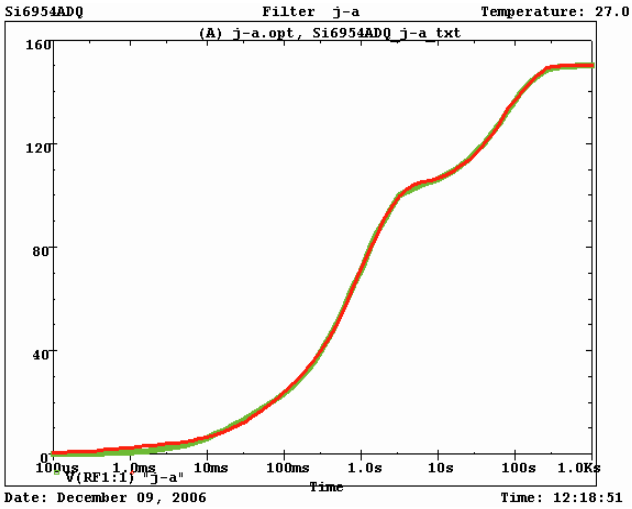
Time: 11:43:23


Si6954ADQ
Filter j-a
Temperature: 27.0
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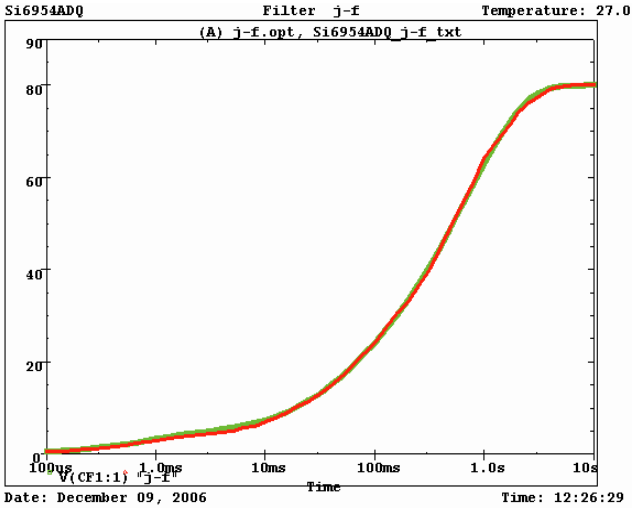
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: December 09, 2006
Time: 12:18:51


Si6954ADQ
Filter j-f
Temperature: 27.0
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90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: December 09, 2006
Time: 12:26:29