R-C Thermal Model Parameters

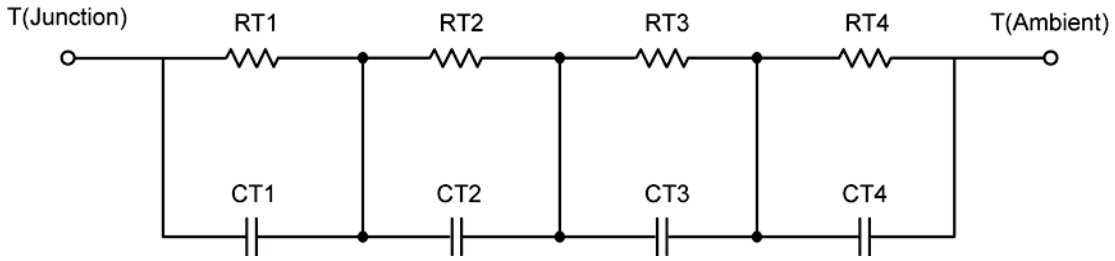
DESCRIPTION

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.

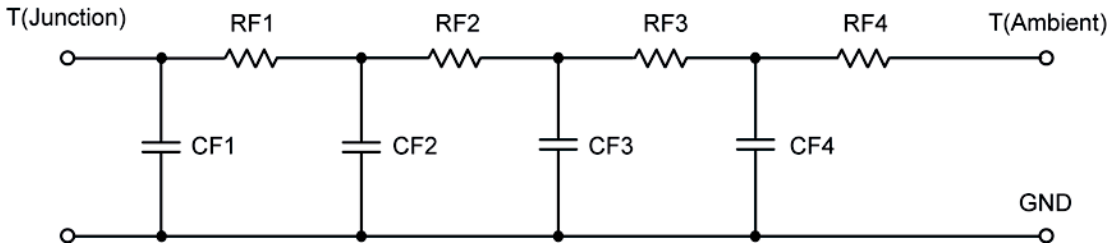
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	41.4159	N/A	16.5114
RT2	43.1519	N/A	33.8852
RT3	14.6377	N/A	28.7965
RT4	55.7945	N/A	5.8069
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	8.9899 m	N/A	4.8332 m
CT2	30.3105 m	N/A	40.5991 m
CT3	759.4132 u	N/A	10.4477 m
CT4	1.5243	N/A	200.0630 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

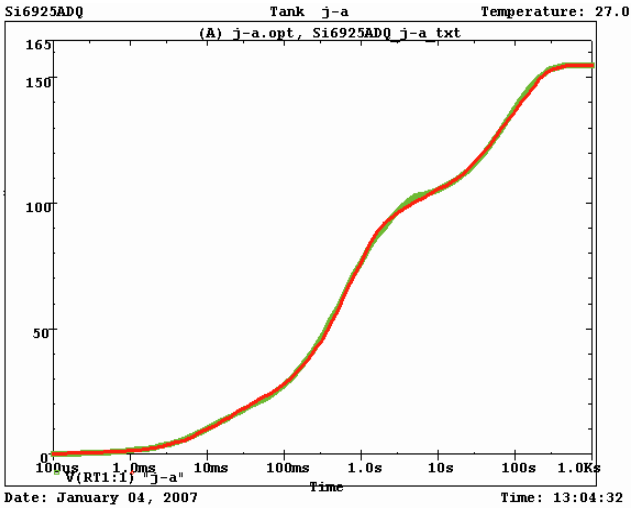


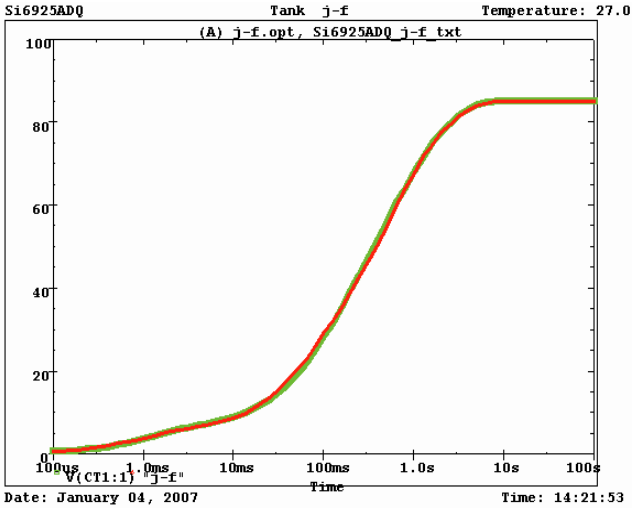
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.4474	N/A	5.7732
RF2	34.1580	N/A	4.8167
RF3	47.4727	N/A	36.8986
RF4	54.9219	N/A	37.5115
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	707.2711 u	N/A	170.0542 u
CF2	5.7896 m	N/A	1.4686 m
CF3	8.9087 m	N/A	1.7632 m
CF4	1.5521	N/A	24.0455 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


Si6925ADQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6925ADQ_j-a_txt
165
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: January 04, 2007
Time: 13:04:32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Tank j-f
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60
40
20
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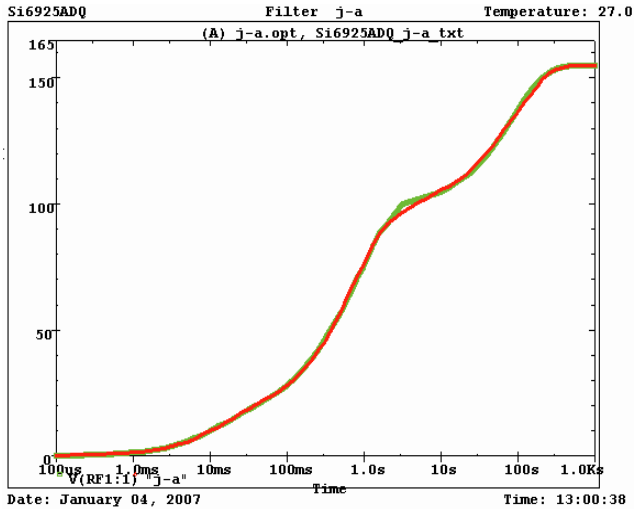
Si6925ADQ
Filter j-a
Temperature: 27.0
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150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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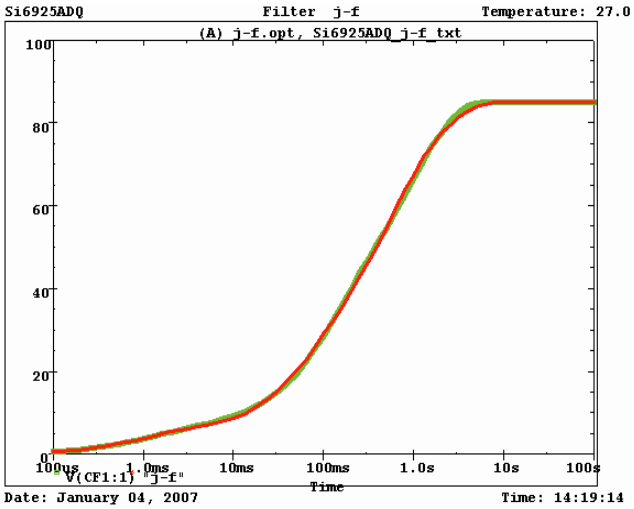
Time
Date: January 04, 2007
Time: 13:00:38


Si6925ADQ
Filter j-f
Temperature: 27.0
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100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: January 04, 2007
Time: 14:19:14