R-C Thermal Model Parameters

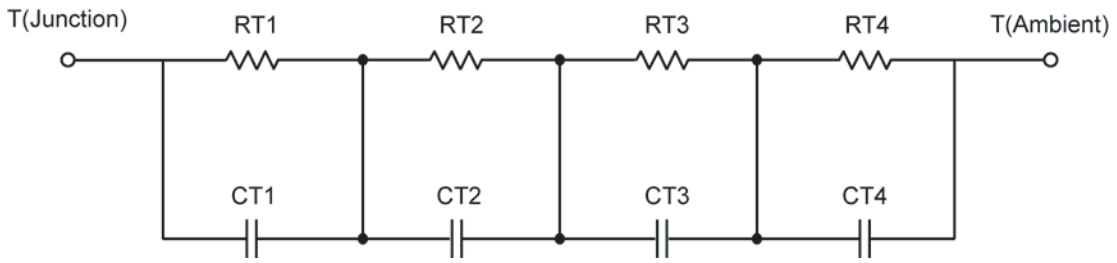
DESCRIPTION

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.

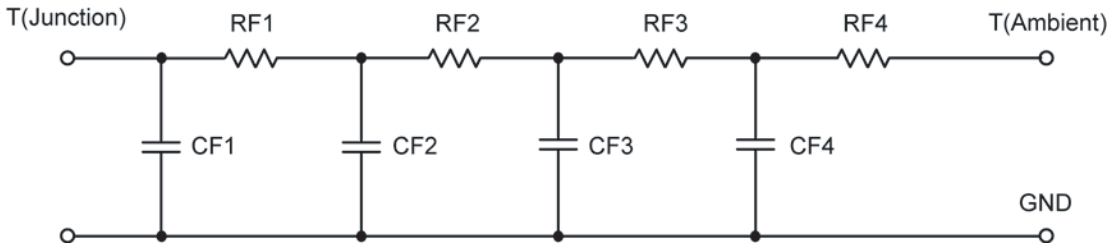
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.0595	N/A	3.6605
RT2	35.2638	N/A	28.2515
RT3	24.3406	N/A	11.4120
RT4	48.3361	N/A	8.6760
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	938.7042 u	N/A	385.8641 u
CT2	32.0396 m	N/A	18.6751 m
CT3	27.4358 m	N/A	162.0668 m
CT4	1.4376	N/A	4.3131 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

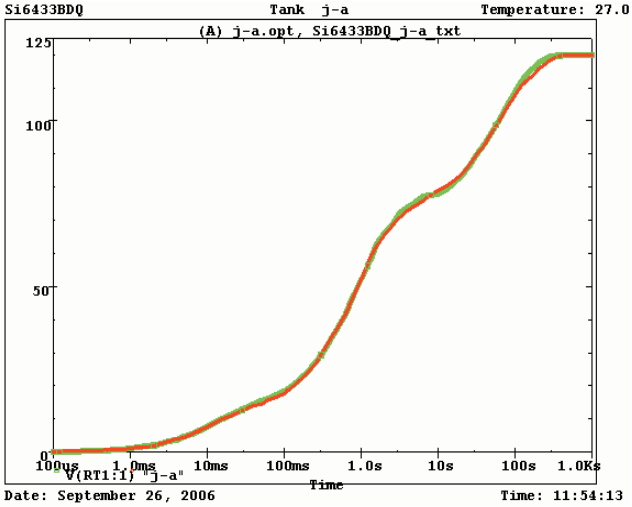


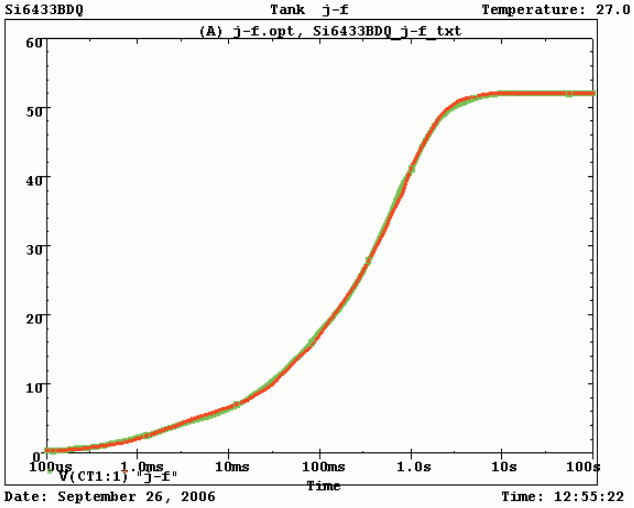
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.4880	N/A	6.4577
RF2	33.0793	N/A	14.1264
RF3	27.8159	N/A	16.9454
RF4	45.6168	N/A	14.4705
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0062 m	N/A	451.9417 u
CF2	11.4267 m	N/A	5.1870 m
CF3	19.1510 m	N/A	13.0853 m
CF4	1.6009	N/A	36.9671 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


Si6433BDQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6433BDQ_j-a_txt
125
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: 11:54:13


Si6433BDQ
Tank j-f
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50
40
30
20
10
0
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Time
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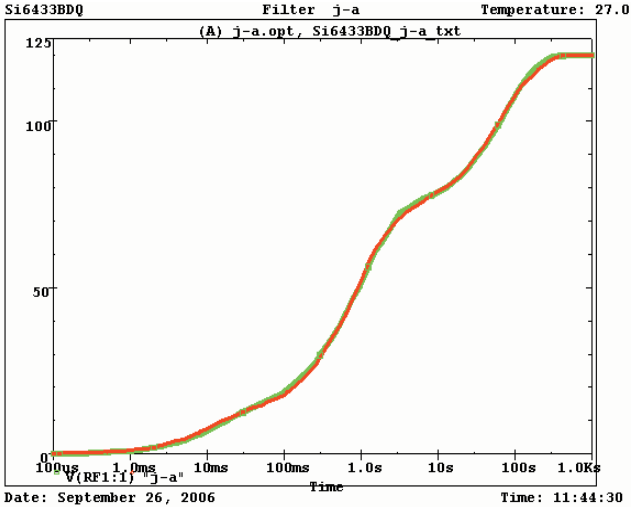
Time: 12:55:22


Si6433BDQ
Filter j-a
Temperature: 27.0
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125
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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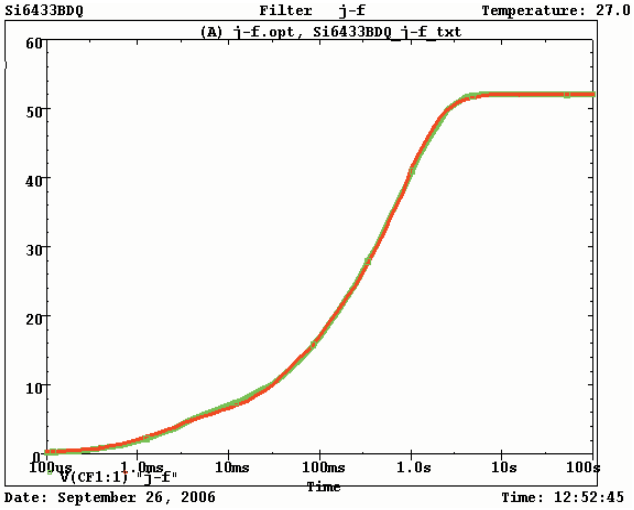
Date: September 26, 2006
Time: 11:44:30


Si6433BDQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6433BDQ_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: 12:52:45