R-C Thermal Model Parameters

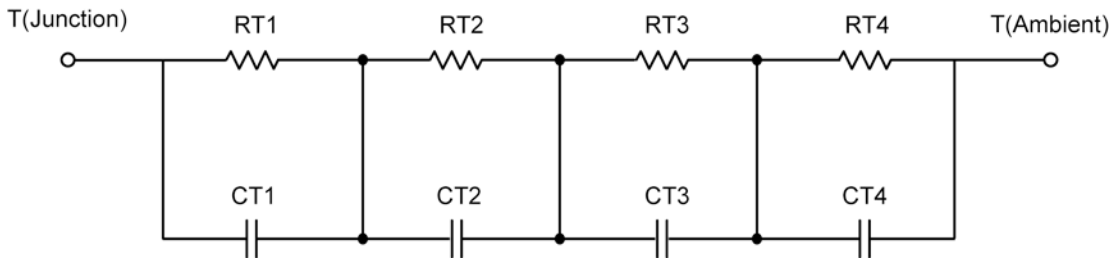
DESCRIPTION

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.

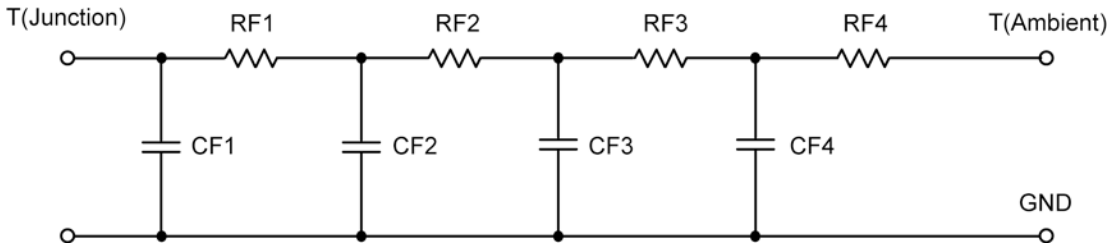
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.1229	N/A	1.1121
RT2	18.8666	N/A	4.7779
RT3	45.8097	N/A	1.1097
RT4	9.2008	N/A	13.0003
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2796 m	N/A	655.6456 u
CT2	3.9286 m	N/A	5.8821 m
CT3	1.3734	N/A	262.0076 m
CT4	182.5361 m	N/A	2.0022 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

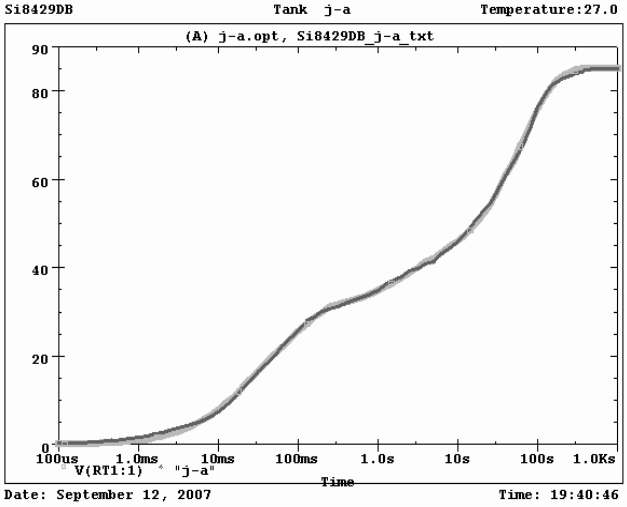


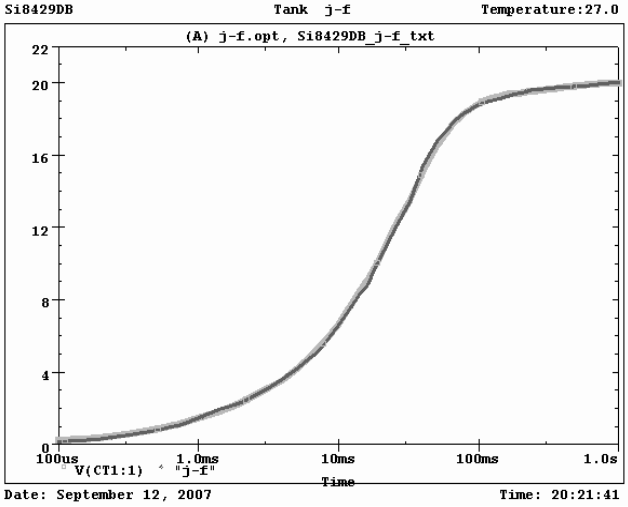
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.3727	N/A	4.0537
RF2	15.8853	N/A	14.8545
RF3	10.7666	N/A	787.3600 m
RF4	43.9754	N/A	304.4400 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	871.6762 u	N/A	656.2894 u
CF2	2.5486 m	N/A	1.0594 m
CF3	135.4187 m	N/A	246.2120 m
CF4	1.2704	N/A	2.3664 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


Si8429DB
Tank j-a
Temperature:27.0
(A) j-a.opt, Si8429DB_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: September 12, 2007
Time: 19:40:46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Tank j-f
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20
16
12
8
4
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10ms
100ms
1.0s
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Time
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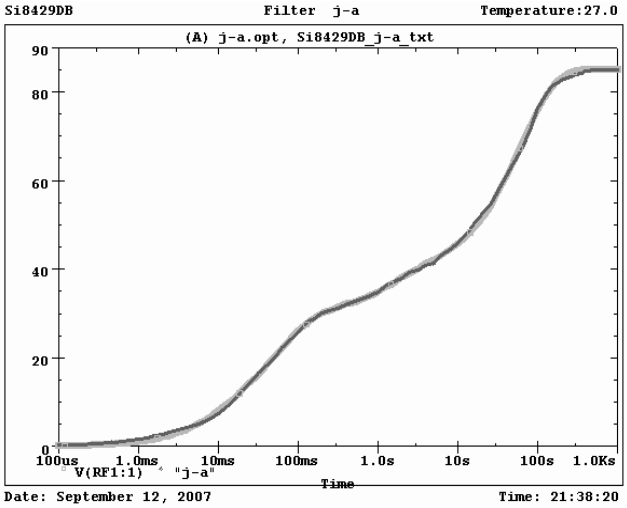
Time: 20:21:41


Si8429DB
Filter j-a
Temperature:27.0
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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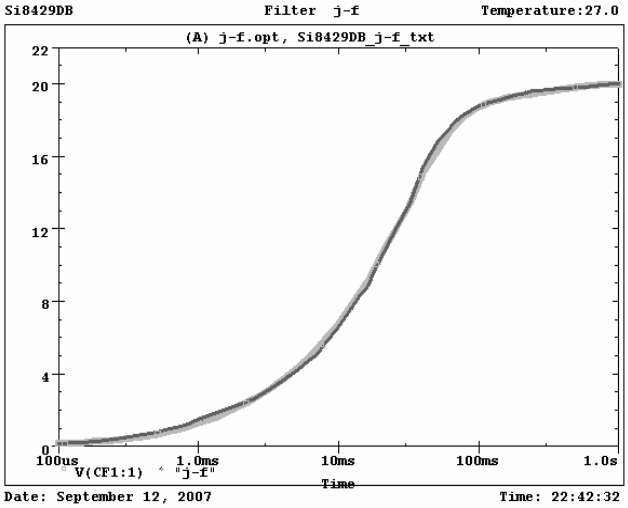
Date: September 12, 2007
Time: 21:38:20


Si8429DB
Filter j-f
Temperature:27.0
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20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1) "j-f"
Time
Date: September 12, 2007
Time: 22:42:32