R-C Thermal Model Parameters

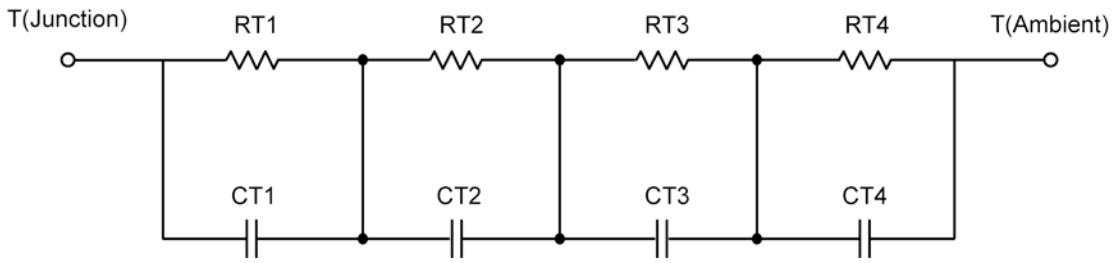
DESCRIPTION

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.

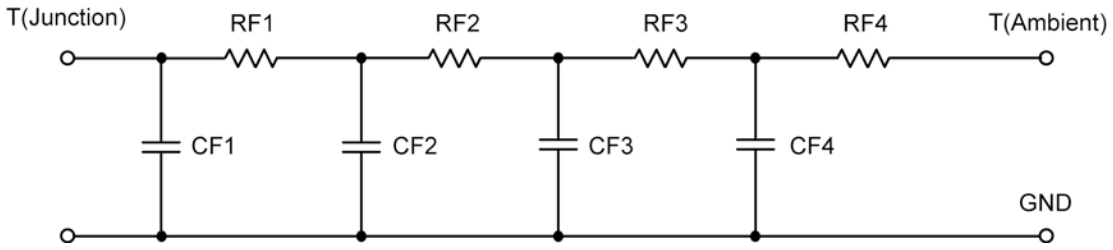
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.5059	N/A	12.9701
RT2	15.1163	N/A	3.7290
RT3	23.6813	N/A	7.7290
RT4	56.6965	N/A	15.5719
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2427 m	N/A	19.2285 m
CT2	14.2046 m	N/A	938.8832 u
CT3	55.0364 m	N/A	9.1418 m
CT4	1.1604	N/A	91.2383 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

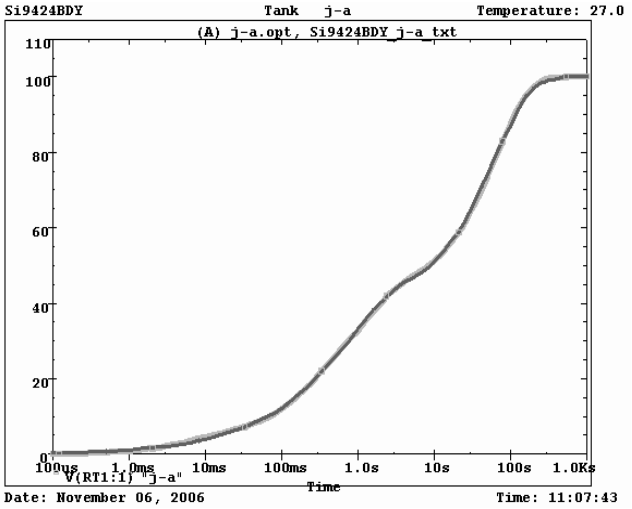


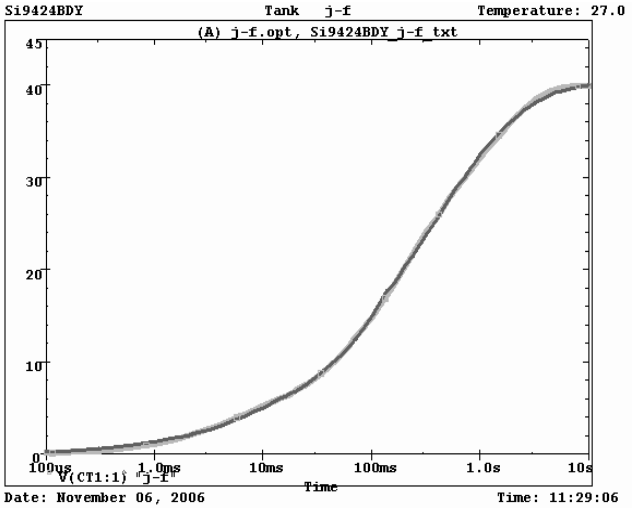
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.8525	N/A	3.6758
RF2	26.6485	N/A	16.4151
RF3	12.7628	N/A	14.3239
RF4	50.7362	N/A	5.5852
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.2791 m	N/A	525.0524 u
CF2	16.3611 m	N/A	4.6712 m
CF3	203.7842 m	N/A	27.6672 m
CF4	1.0748	N/A	298.4397 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


Si9424BDY
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si9424BDY_j-a_txt
110
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: November 06, 2006
Time: 11:07:43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Tank j-f
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45
40
30
20
10
0
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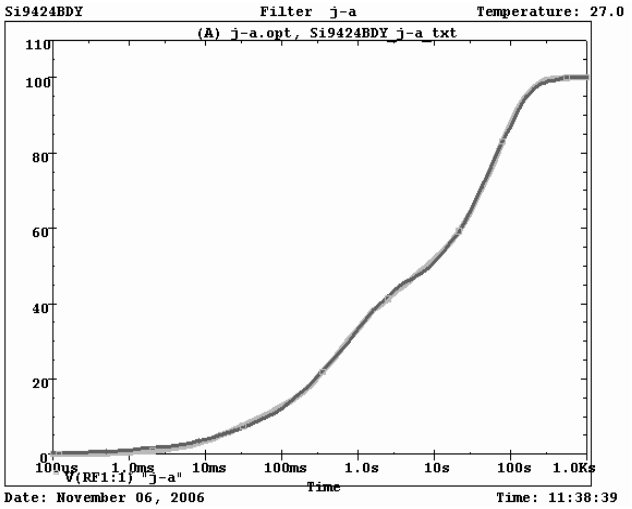
Si9424BDY
Filter j-a
Temperature: 27.0
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110
100
80
60
40
20
0
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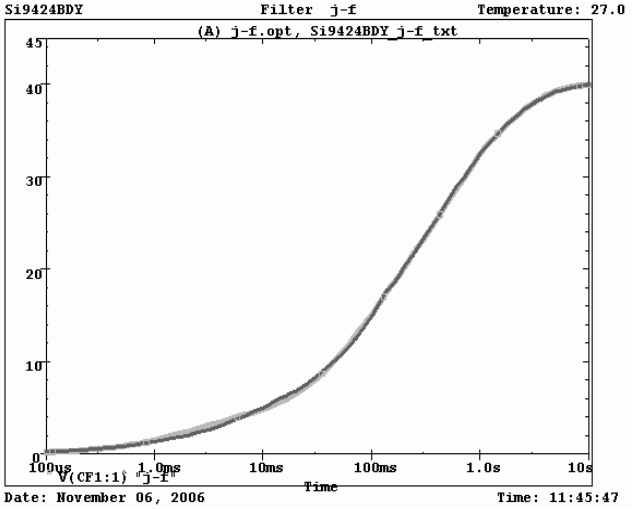
Time: 11:38:39


Si9424BDY
Filter j-f
Temperature: 27.0
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45
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: November 06, 2006
Time: 11:45:47