R-C Thermal Model Parameters

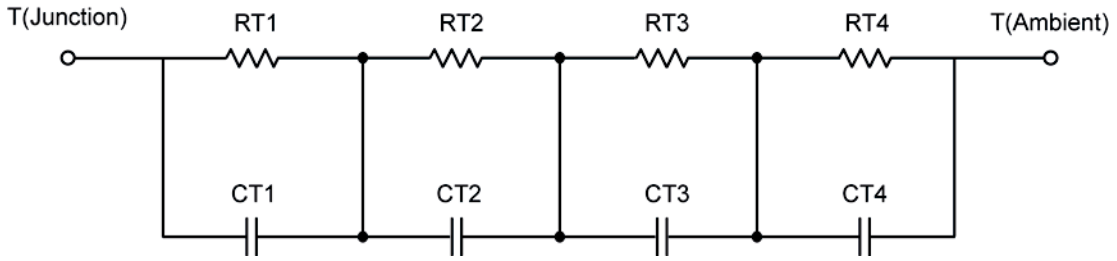
DESCRIPTION

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.

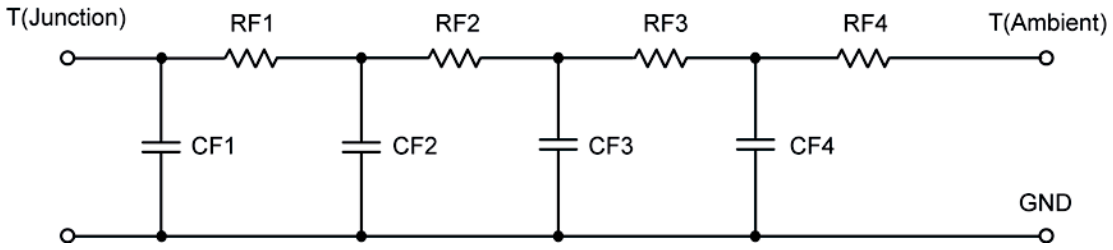
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.2896	N/A	3.1551
RT2	27.4860	N/A	5.4509
RT3	28.1401	N/A	11.8343
RT4	28.0843	N/A	7.5597
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	3.2599 m	N/A	574.8487 u
CT2	34.8260 m	N/A	19.1433 m
CT3	1.6071	N/A	84.4742 m
CT4	2.9566	N/A	11.1212 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

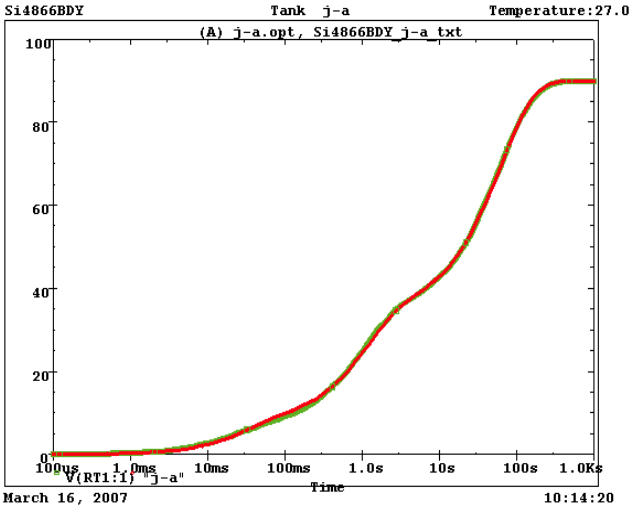


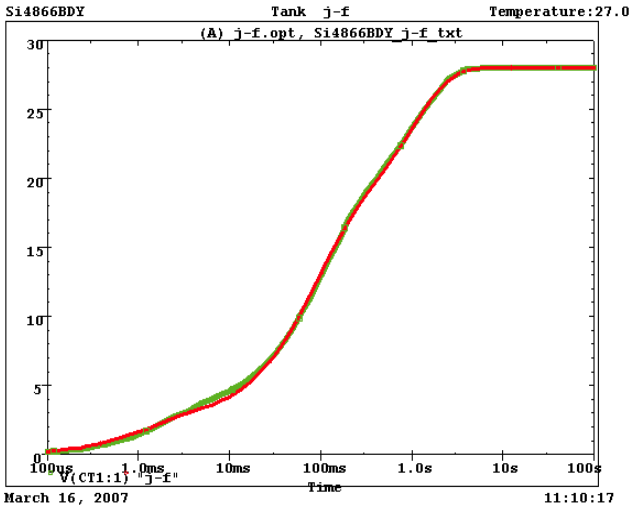
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.0889	N/A	3.2893
RF2	28.4864	N/A	10.8428
RF3	27.1549	N/A	6.9755
RF4	27.2698	N/A	6.8924
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.2842 m	N/A	516.9421 u
CF2	32.7491 m	N/A	4.8155 m
CF3	893.9001 m	N/A	20.3223 m
CF4	832.5602 m	N/A	125.1171 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


Si4866BDY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4866BDY_j-a_txt
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
March 16, 2007
10:14:20


Si4866BDY
Tank j-f
Temperature:27.0
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30
25
20
15
10
5
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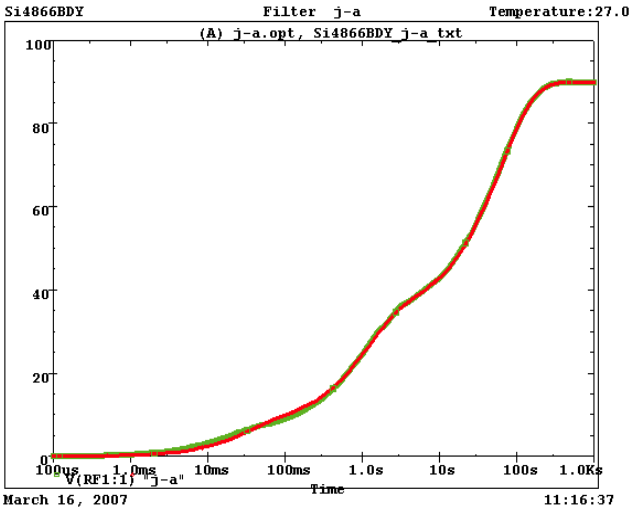
11:10:17


Si4866BDY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4866BDY_j-a_txt
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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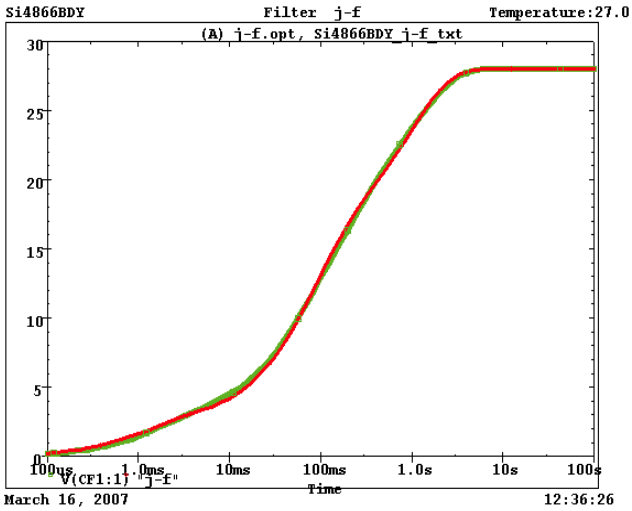
11:16:37


Si4866BDY
Filter j-f
Temperature:27.0
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30
25
20
15
10
5
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
March 16, 2007
12:36:26