R-C Thermal Model Parameters

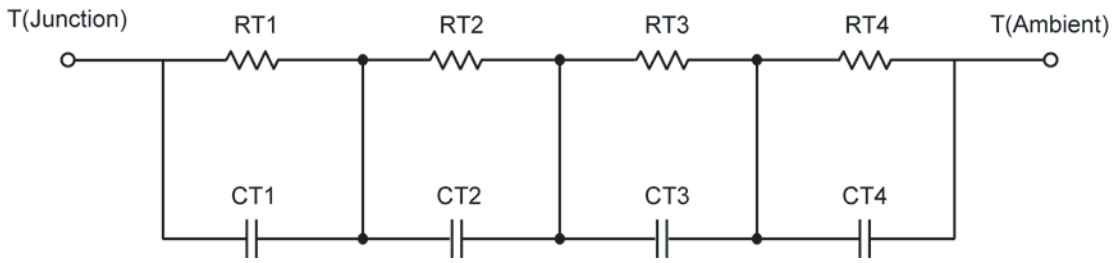
DESCRIPTION

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.

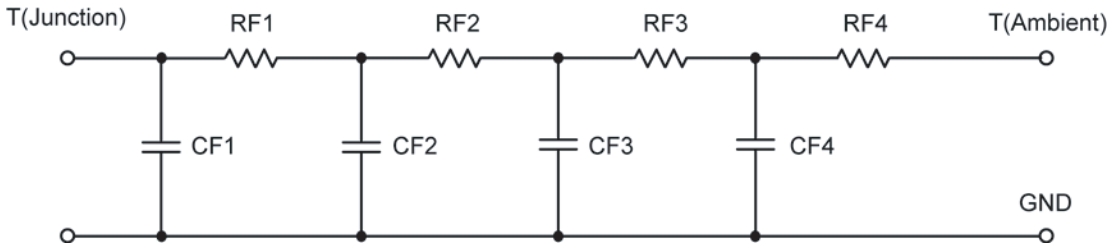
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.2656	N/A	7.2424
RT2	32.3224	N/A	4.1194
RT3	32.5441	N/A	19.2549
RT4	34.8679	N/A	11.3833
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2122 m	N/A	5.6371 m
CT2	113.7516 m	N/A	1.3087 m
CT3	6.9378 m	N/A	18.4074 m
CT4	2.5174	N/A	6.3824 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

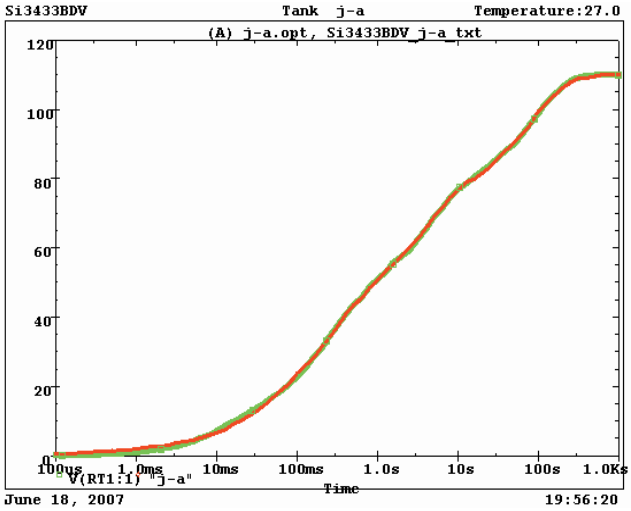


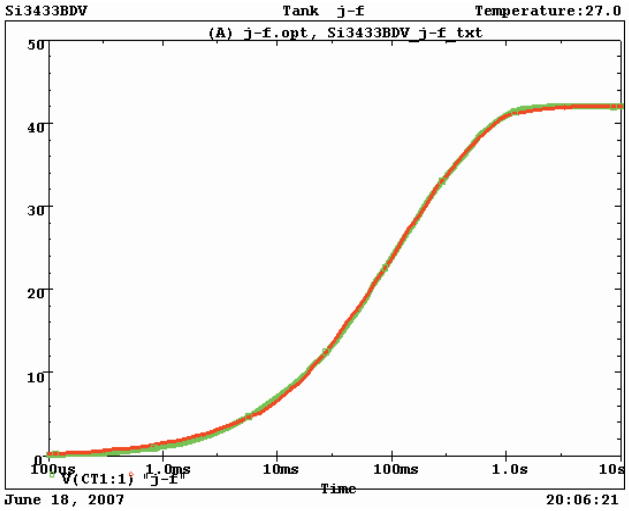
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.2545	N/A	7.3028
RF2	30.5275	N/A	12.7227
RF3	31.0477	N/A	8.4053
RF4	33.1703	N/A	13.5692
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.1505 m	N/A	791.9614 u
CF2	5.9493 m	N/A	1.7140 m
CF3	95.8584 m	N/A	2.1604 m
CF4	2.4573	N/A	17.6127 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


Si3433BDV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3433BDV_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
June 18, 2007
19:56:20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Tank j-f
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40
30
20
10
0
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10ms
100ms
1.0s
10s
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Time
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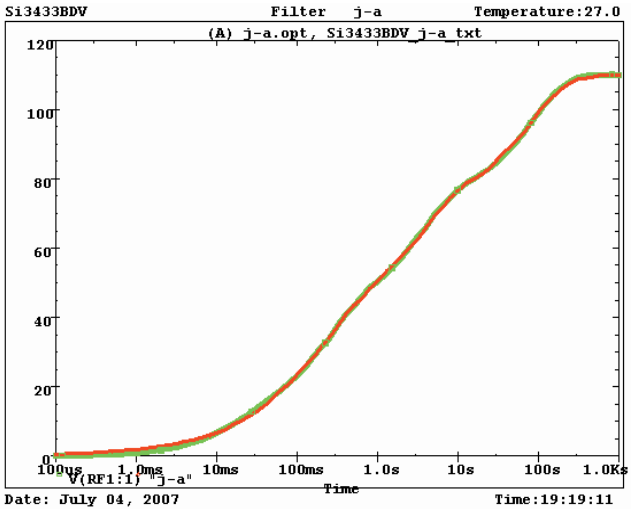
20:06:21


Si3433BDV
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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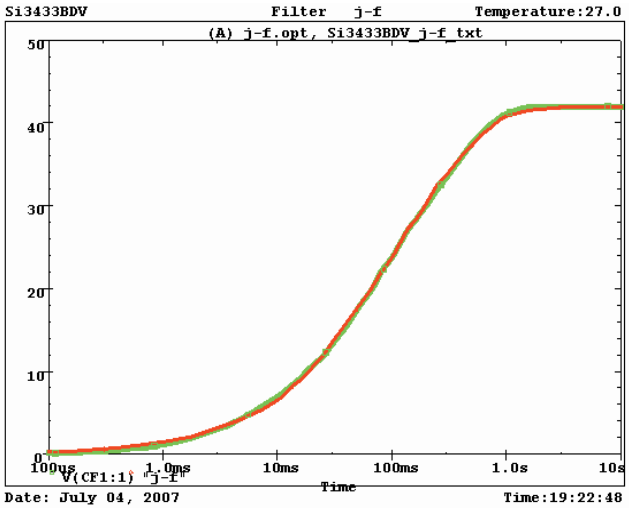
Time
Date: July 04, 2007
Time:19:19:11


Si3433BDV
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: July 04, 2007
Time:19:22:48