R-C Thermal Model Parameters

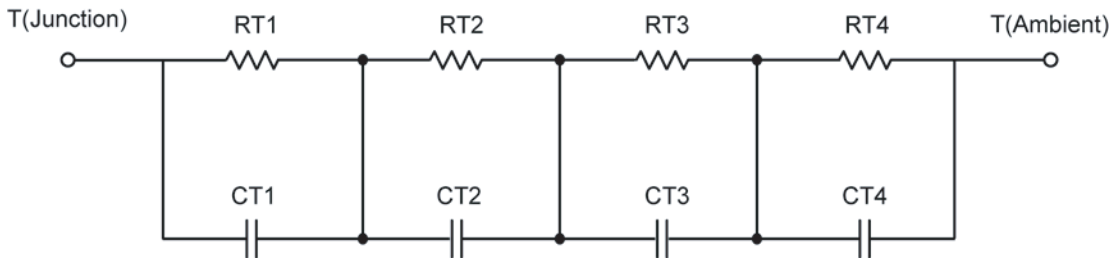
DESCRIPTION

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.

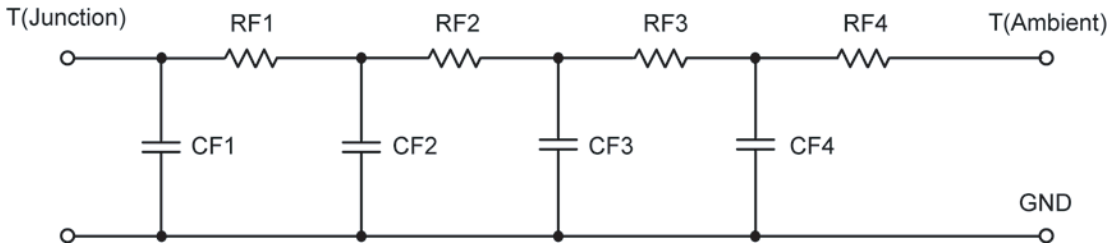
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	20.7160	N/A	17.1389
RT2	5.5506	N/A	3.9724
RT3	27.9011	N/A	9.8622
RT4	55.6595	N/A	8.8776
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	11.7362 m	N/A	2.4908 m
CT2	1.5339 m	N/A	285.8137 u
CT3	60.6292 m	N/A	15.2904 m
CT4	1.3777	N/A	93.4063 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

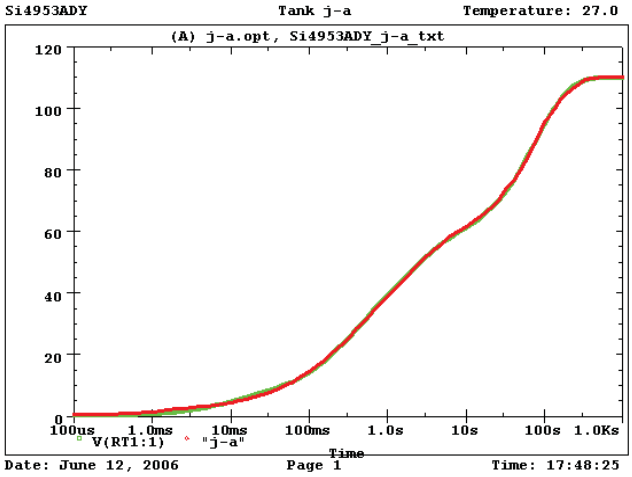


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.0294	N/A	4.5113
RF2	27.9960	N/A	24.0737
RF3	22.8634	N/A	10.5751
RF4	51.2115	N/A	1.2756
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.5740 m	N/A	207.0248 u
CF2	9.0222 m	N/A	1.8986 m
CF3	81.6519 m	N/A	41.4354 m
CF4	1.4719	N/A	10.4137

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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Tank j-a
Temperature: 27.0
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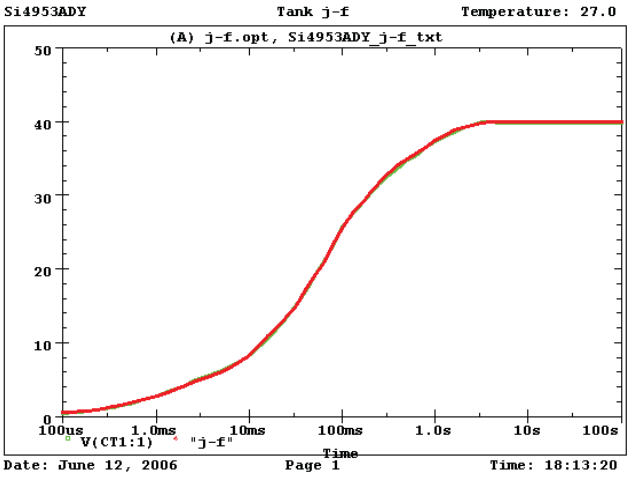
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: June 12, 2006
Page 1
Time: 17:48:25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0
100us
1.0ms
10ms
100ms
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10s
100s
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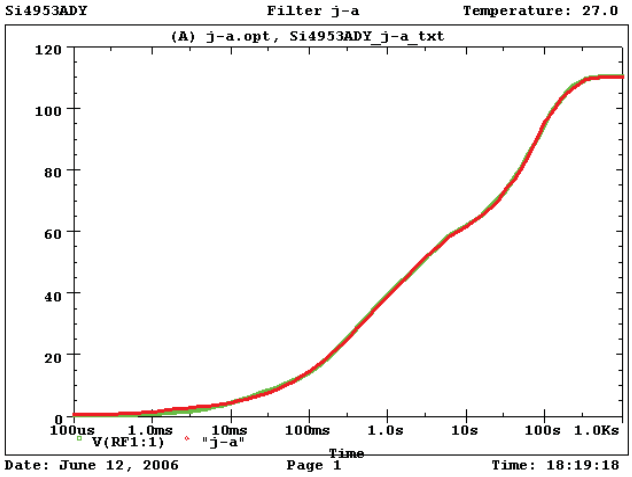
Time
Date: June 12, 2006
Page 1
Time: 18:13:20


Si4953ADY
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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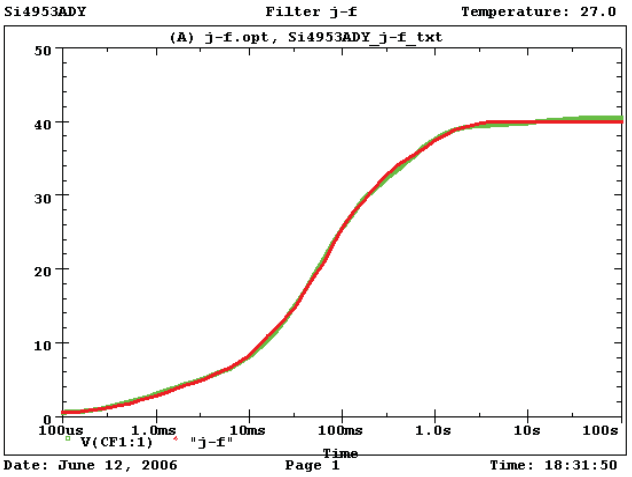
"j-a"
Time
Date: June 12, 2006
Page 1
Time: 18:19:18


Si4953ADY
Filter j-f
Temperature: 27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: June 12, 2006
Page 1
Time: 18:31:50