R-C Thermal Model Parameters

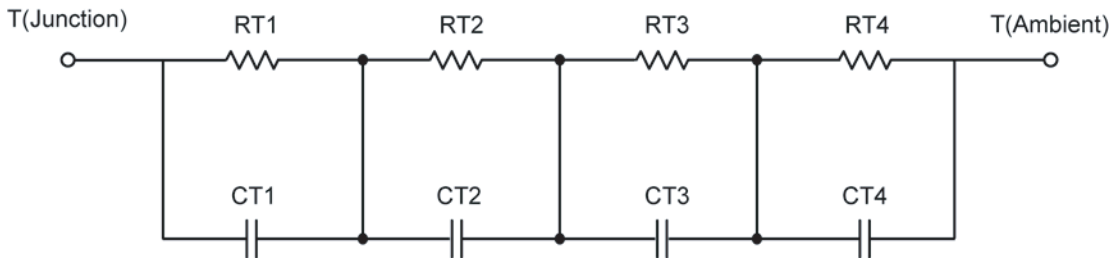
DESCRIPTION

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.

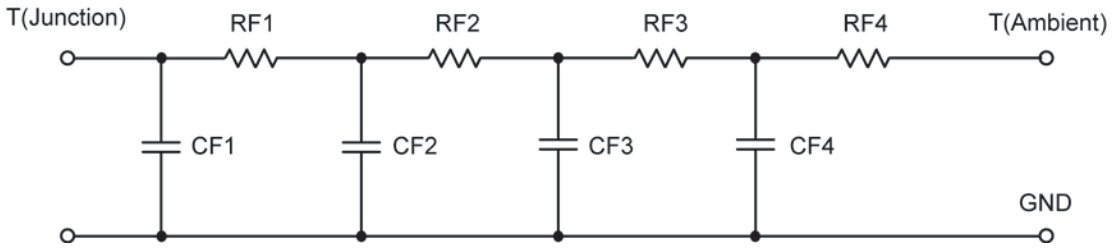
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.9604	N/A	5.7953
RT2	6.3818	N/A	923.7476 m
RT3	13.3371	N/A	5.8236
RT4	37.9264	N/A	8.4613
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	41.6847 m	N/A	54.8120 m
CT2	8.8410 m	N/A	1.2546 m
CT3	356.1870 m	N/A	12.8310 m
CT4	2.0833	N/A	196.0715 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

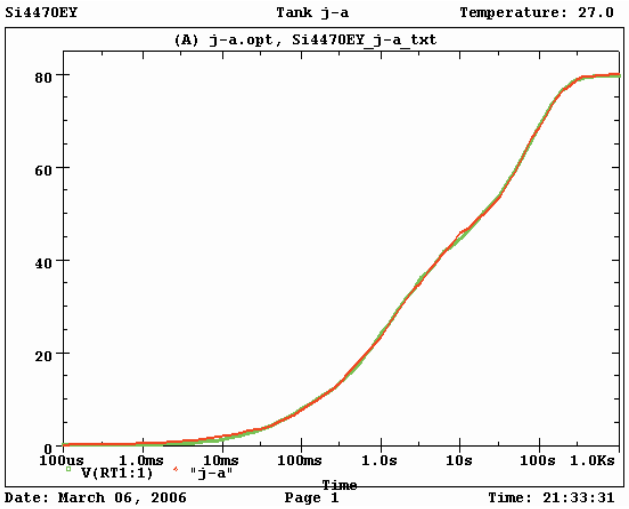


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.1205	N/A	1.6149
RF2	23.7400	N/A	8.9202
RF3	14.9587	N/A	7.2244
RF4	35.7281	N/A	3.2532
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.8970 m	N/A	1.9824 m
CF2	21.5550 m	N/A	8.7635 m
CF3	162.1276 m	N/A	68.3828 m
CF4	1.9274	N/A	473.3334 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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Tank j-a
Temperature: 27.0
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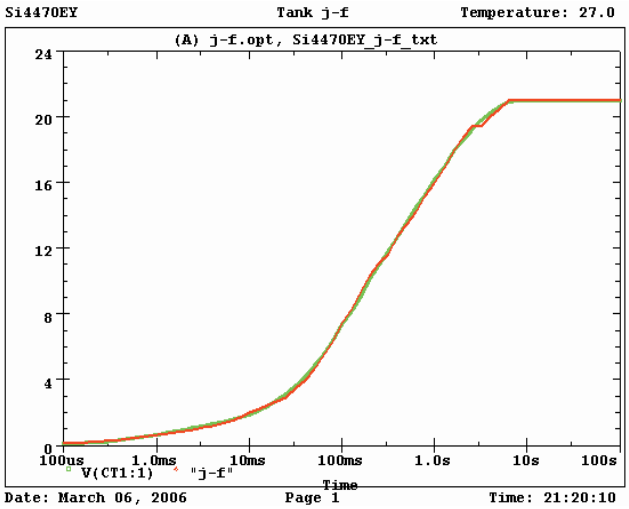
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 06, 2006
Page 1
Time: 21:33:31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Tank j-f
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20
16
12
8
4
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100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
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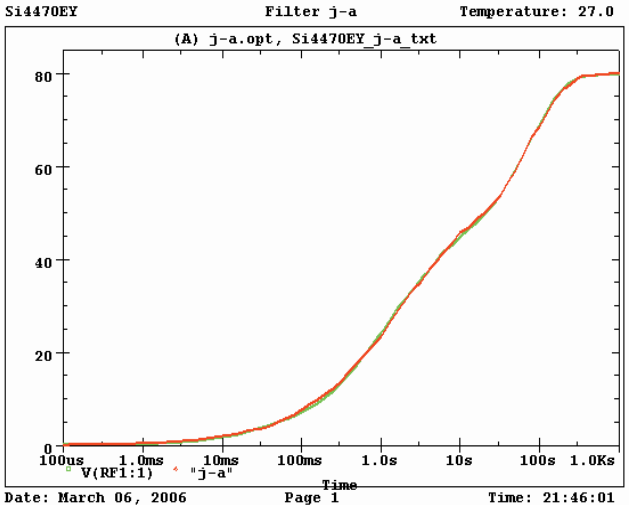
Time
Date: March 06, 2006
Page 1
Time: 21:20:10


Si4470EY
Filter j-a
Temperature: 27.0
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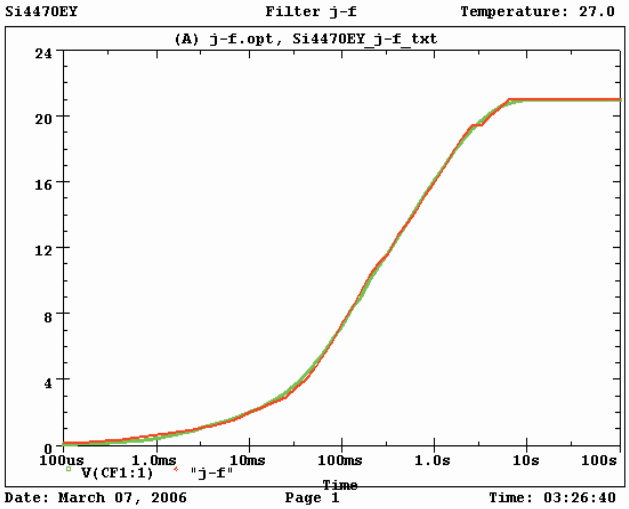
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 06, 2006
Page 1
Time: 21:46:01


Si4470EY
Filter j-f
Temperature: 27.0
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20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: March 07, 2006
Page 1
Time: 03:26:40