R-C Thermal Model Parameters

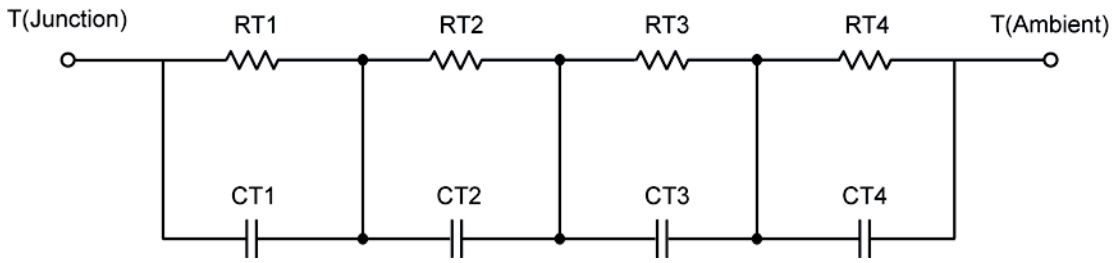
DESCRIPTION

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.

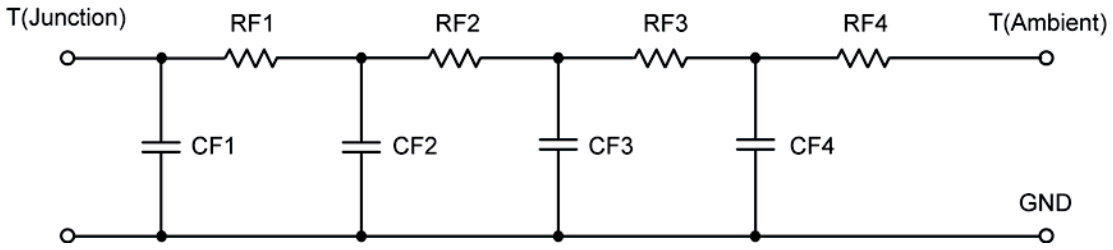
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.7482	N/A	22.4222
RT2	31.8893	N/A	3.2787
RT3	24.3920	N/A	973.3628 m
RT4	58.9998	N/A	18.1068
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	311.8705 u	N/A	41.7746 m
CT2	62.5050 m	N/A	292.0507 u
CT3	8.4858 m	N/A	860.0414 u
CT4	1.3320	N/A	3.8677 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

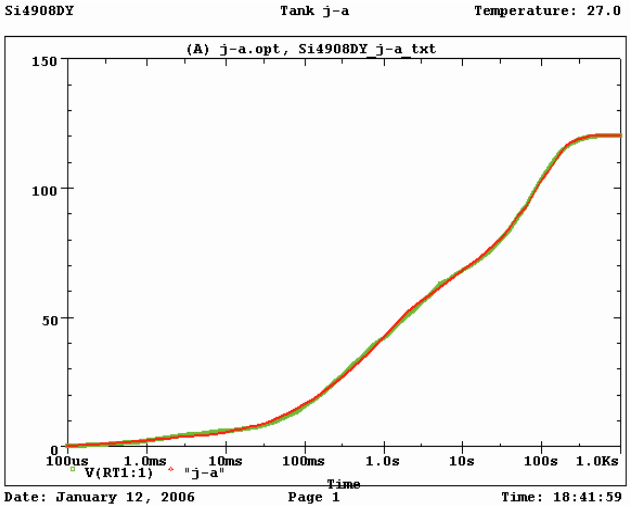


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.9479	N/A	4.7274
RF2	28.7689	N/A	19.1645
RF3	29.2412	N/A	13.0947
RF4	56.0376	N/A	8.1456
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	440.0918 u	N/A	213.5880 u
CF2	7.2483 m	N/A	3.2062 m
CF3	53.9569 m	N/A	25.5973 m
CF4	1.3300	N/A	121.4973 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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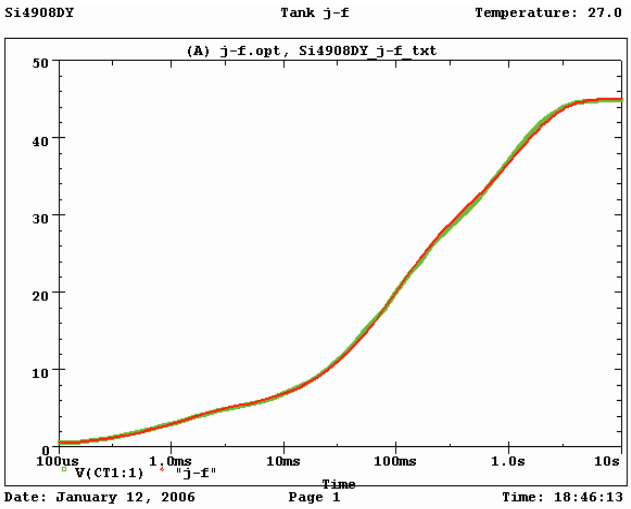
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si4908DY_j-a_txt
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: January 12, 2006
Page 1
Time: 18:41:59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Tank j-f
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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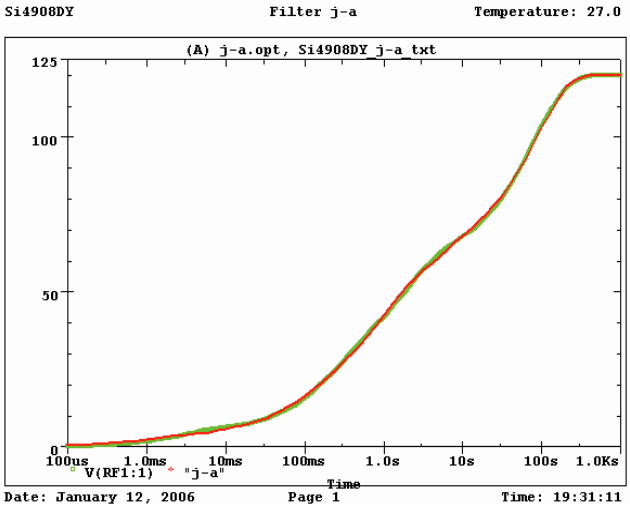
Time
Date: January 12, 2006
Page 1
Time: 18:46:13


Si4908DY
Filter j-a
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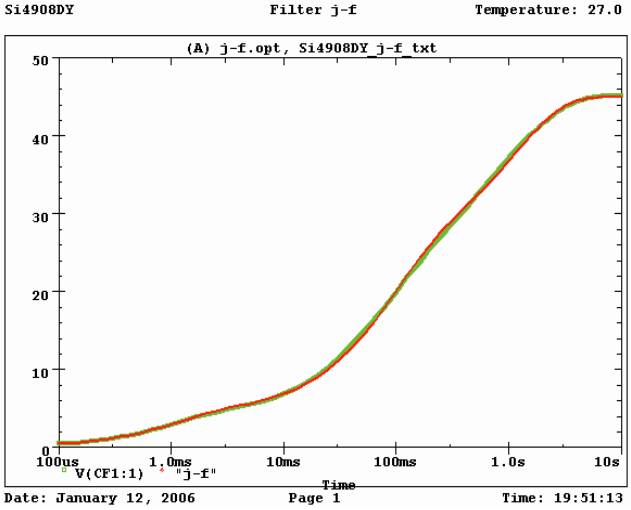
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: January 12, 2006
Page 1
Time: 19:31:11


Si4908DY
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: January 12, 2006
Page 1
Time: 19:51:13