R-C Thermal Model Parameters

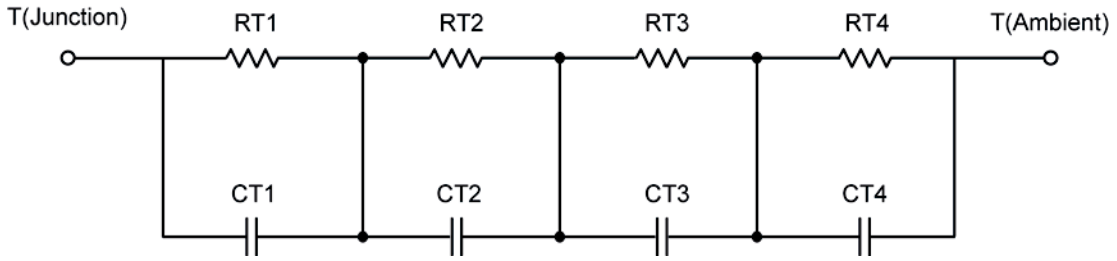
DESCRIPTION

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.

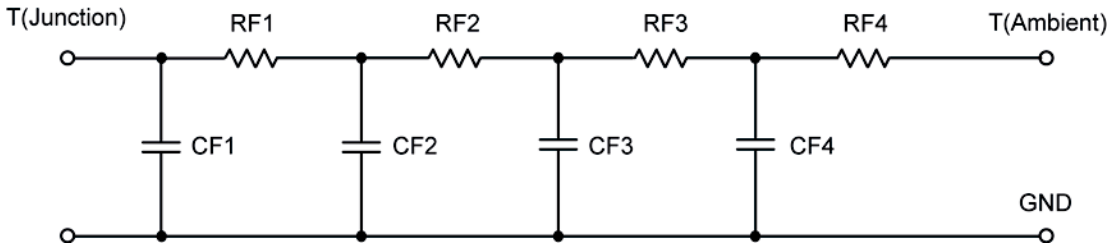
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.4662	N/A	12.0883
RT2	20.1880	N/A	10.3992
RT3	26.5059	N/A	11.2277
RT4	56.9154	N/A	1.2848
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	4.1930 m	N/A	183.8612 m
CT2	113.5926 m	N/A	6.1898 m
CT3	17.3701 m	N/A	33.4172 m
CT4	1.6390	N/A	1.1851 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

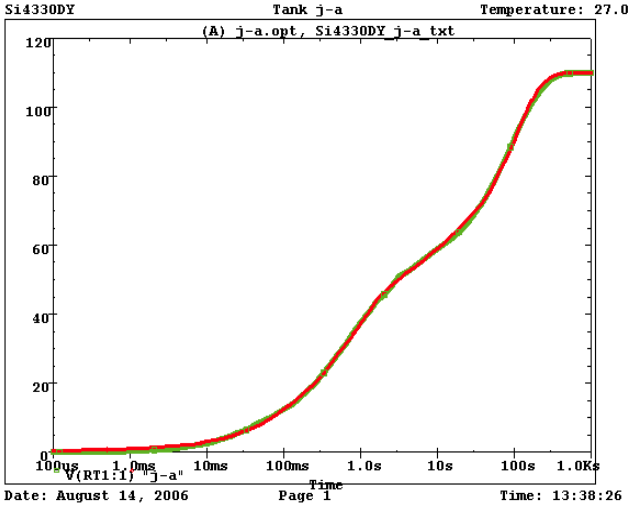


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	11.3834	N/A	4.9418
RF2	30.0190	N/A	12.0522
RF3	15.4111	N/A	12.2565
RF4	53.1865	N/A	5.7495
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.4497 m	N/A	2.2530 m
CF2	13.8546 m	N/A	4.2653 m
CF3	143.9691 m	N/A	36.5119 m
CF4	1.5561	N/A	332.2691 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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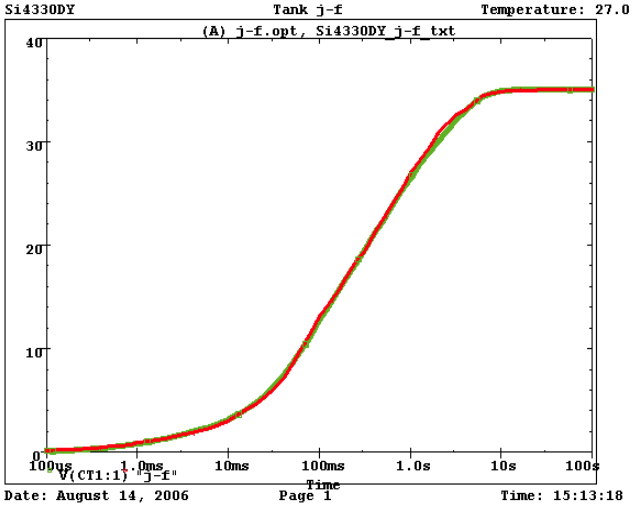
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: August 14, 2006
Page 1
Time: 13:38:26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30
20
10
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100us
1.0ms
10ms
100ms
1.0s
10s
100s
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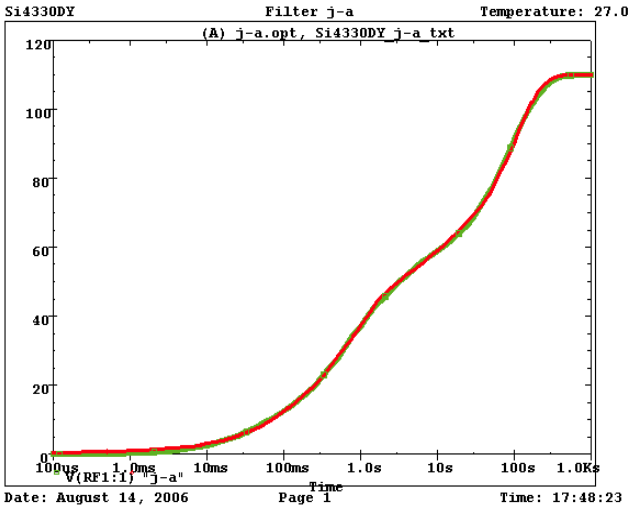
Time
Date: August 14, 2006
Page 1
Time: 15:13:18


Si4330DY
Filter j-a
Temperature: 27.0
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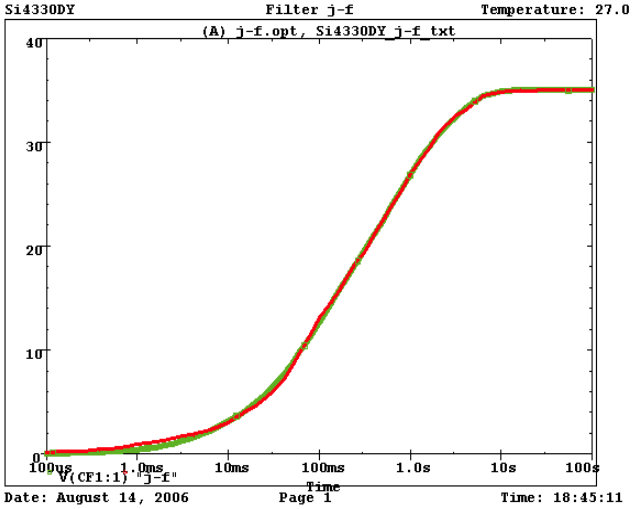
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: August 14, 2006
Page 1
Time: 17:48:23


Si4330DY
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: August 14, 2006
Page 1
Time: 18:45:11