R-C Thermal Model Parameters

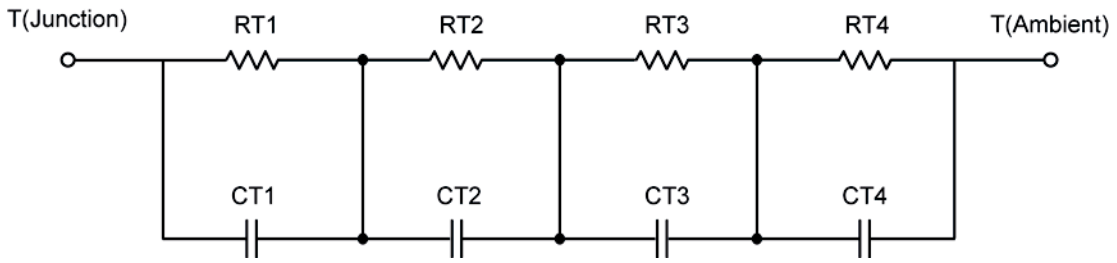
DESCRIPTION

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.

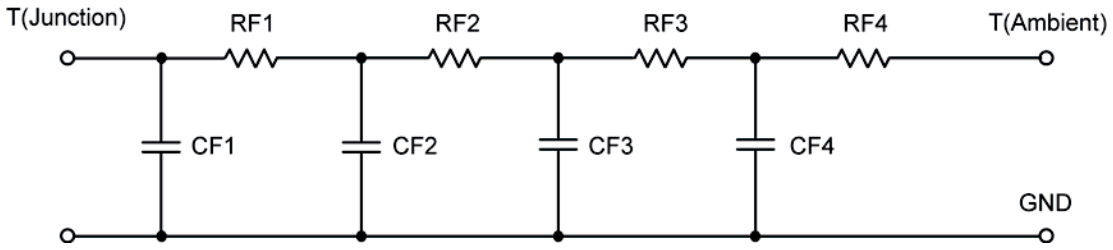
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.8092	N/A	13.7868
RT2	23.1315	N/A	4.3985
RT3	27.8929	N/A	13.7401
RT4	50.8875	N/A	8.3180
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	665.4582 u	N/A	5.8132 m
CT2	115.4287 m	N/A	430.5131 u
CT3	13.5551 m	N/A	55.2649 m
CT4	1.1187	N/A	215.4369 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

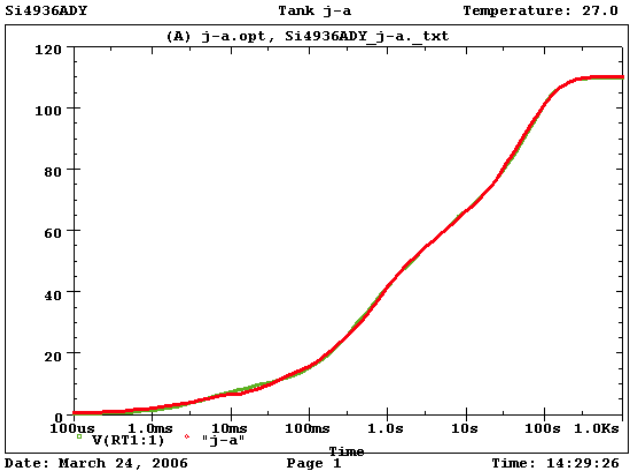


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.7032	N/A	5.1975
RF2	30.4976	N/A	16.8150
RF3	22.3850	N/A	9.1510
RF4	47.9775	N/A	8.7791
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	670.3049 u	N/A	430.6036 u
CF2	11.0549 m	N/A	4.8667 m
CF3	74.7262 m	N/A	44.6543 m
CF4	1.0086	N/A	35.9846 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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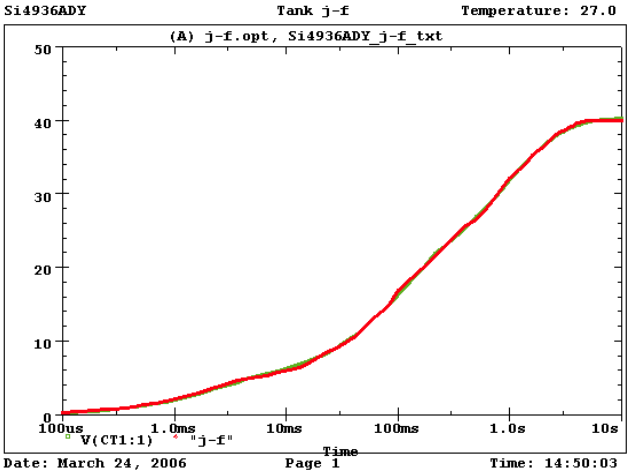
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 24, 2006
Page 1
Time: 14:29:26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10s
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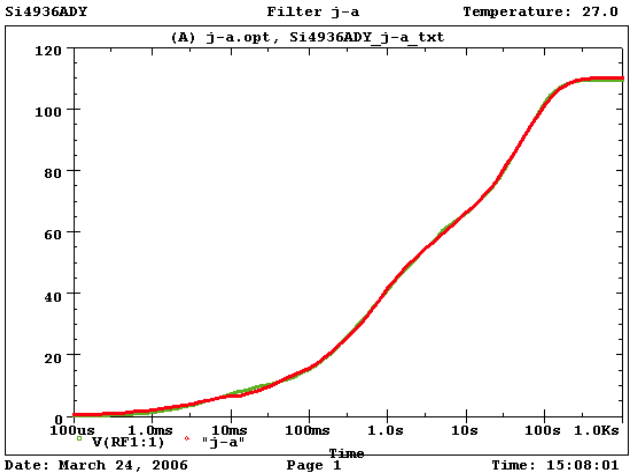
Si4936ADY
Filter j-a
Temperature: 27.0
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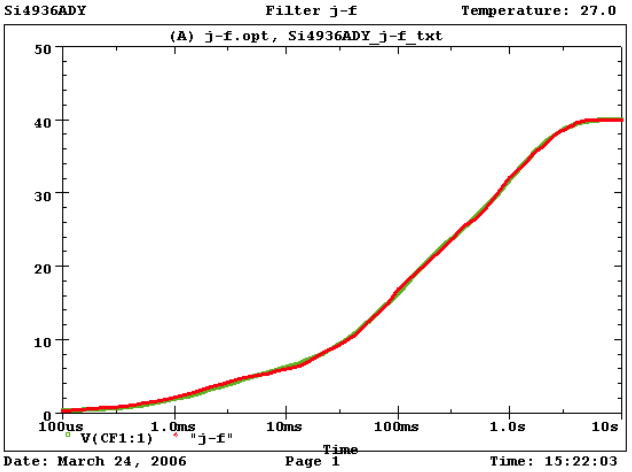
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 24, 2006
Page 1
Time: 15:08:01


Si4936ADY
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: March 24, 2006
Page 1
Time: 15:22:03