R-C Thermal Model Parameters

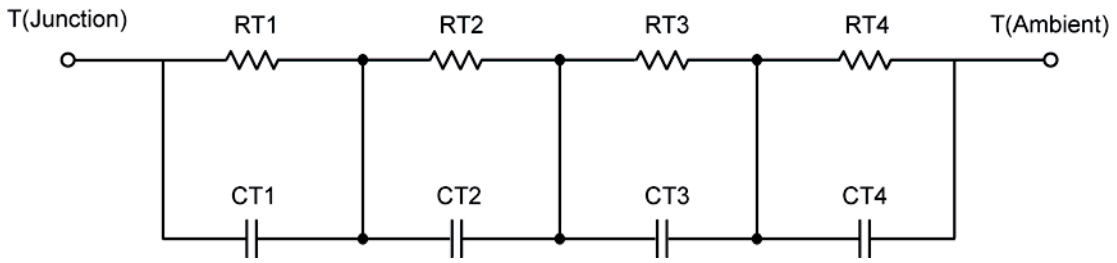
DESCRIPTION

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.

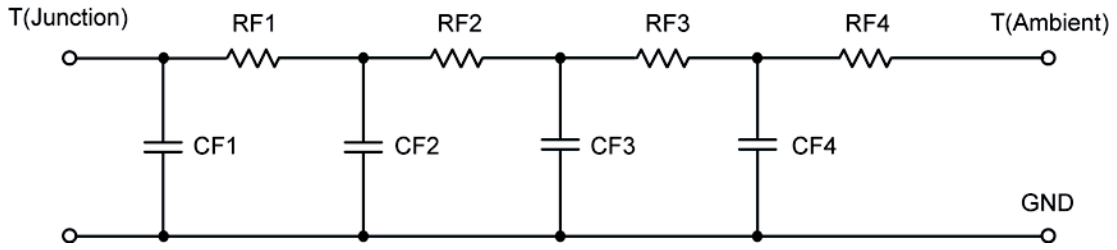
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.9474	N/A	8.2904
RT2	33.9853	N/A	17.8977
RT3	27.4902	N/A	20.3100
RT4	49.5771	N/A	5.5019
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.0278 m	N/A	91.5276 m
CT2	47.8515 m	N/A	21.9016 m
CT3	33.2779 m	N/A	94.7500 m
CT4	1.7346	N/A	4.4377 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

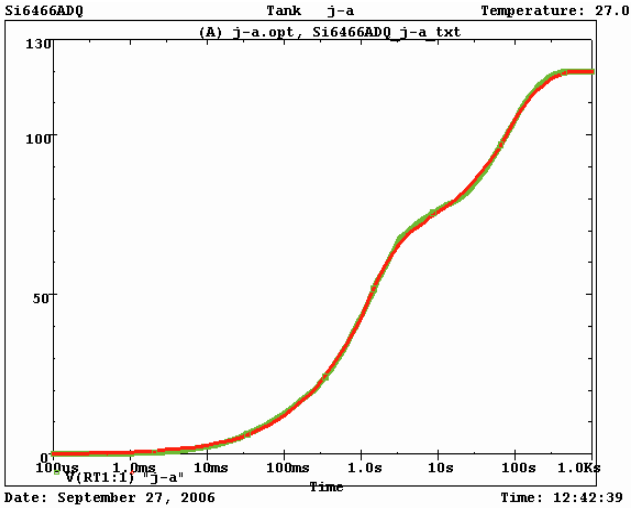


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	10.0518	N/A	4.0285
RF2	31.3167	N/A	14.0715
RF3	30.7609	N/A	21.3357
RF4	47.8706	N/A	12.5643
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.6043 m	N/A	2.0744 m
CF2	10.4381 m	N/A	6.4513 m
CF3	26.8453 m	N/A	12.7907 m
CF4	1.6503	N/A	119.8684 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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130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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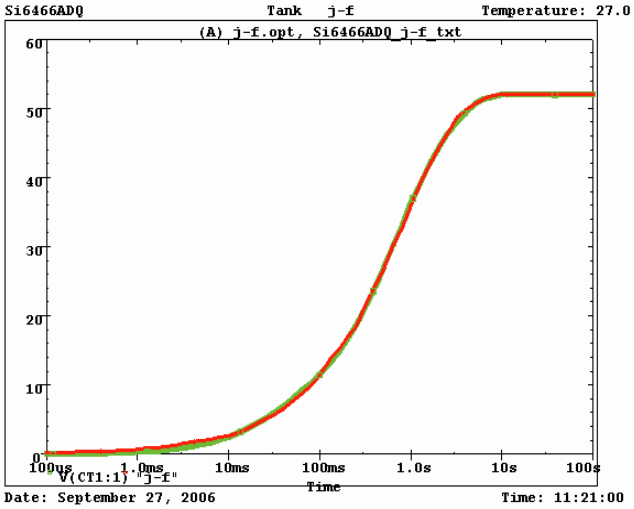
Time
Date: September 27, 2006
Time: 12:42:39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Tank j-f
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40
30
20
10
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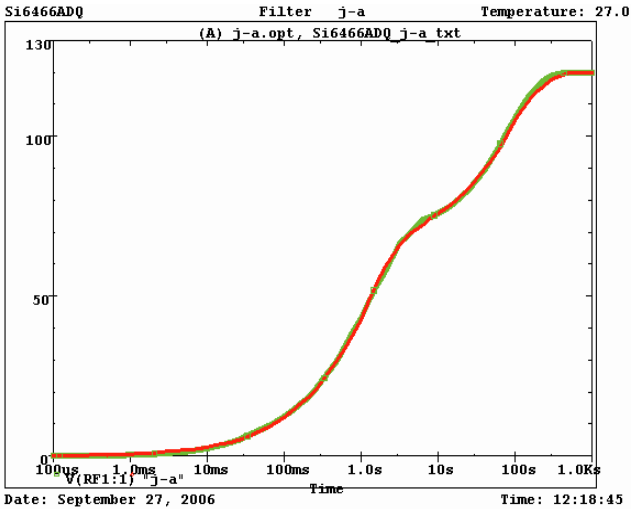
Si6466ADQ
Filter j-a
Temperature: 27.0
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100
50
0
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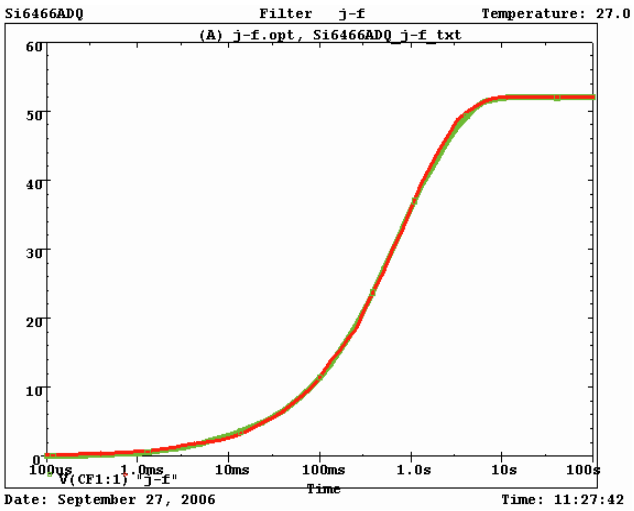
Si6466ADQ
Filter j-f
Temperature: 27.0
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50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: September 27, 2006
Time: 11:27:42