R-C Thermal Model Parameters

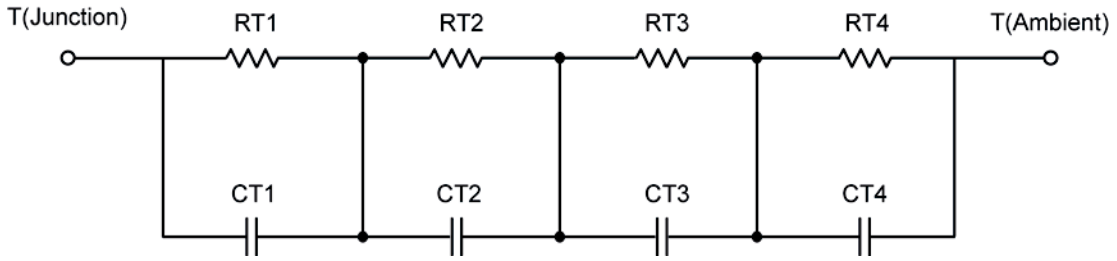
DESCRIPTION

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.

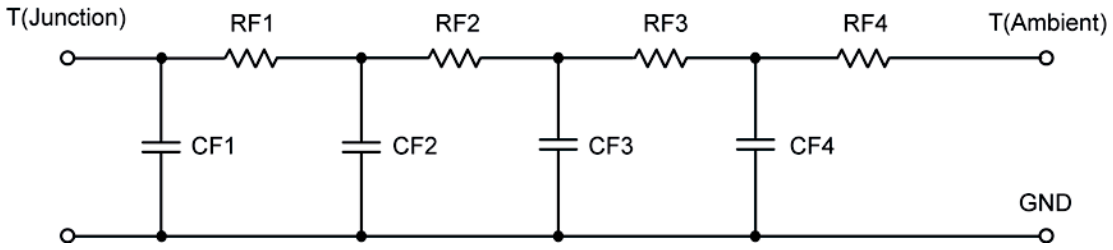
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	71.5422	N/A	53.2352
RT2	131.9135	N/A	8.4576
RT3	82.5561	N/A	97.1650
RT4	143.7499	N/A	179.9476
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	452.9197 u	N/A	781.7864 u
CT2	8.1825 m	N/A	65.2729 u
CT3	254.3411 m	N/A	94.2755 m
CT4	2.9163 m	N/A	3.0883 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

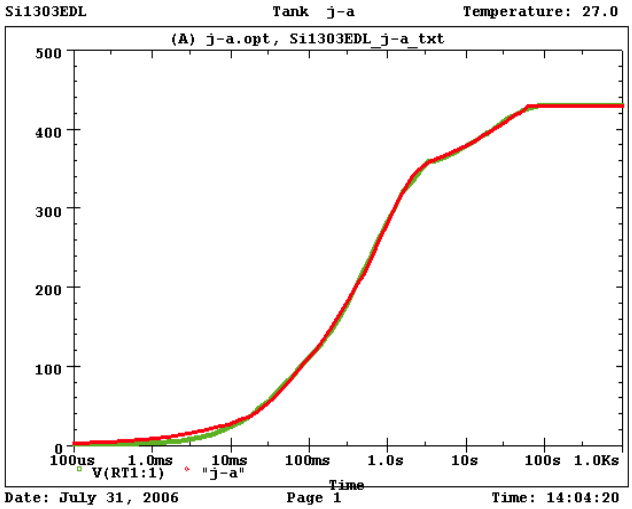


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	32.3713	N/A	22.1739
RF2	112.5471	N/A	113.3663
RF3	200.2529	N/A	117.7104
RF4	84.8541	N/A	85.9654
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	163.5244 u	N/A	170.2769 u
CF2	581.8831 u	N/A	877.6562 u
CF3	2.5342 m	N/A	4.0290 m
CF4	213.1189 m	N/A	98.7777 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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300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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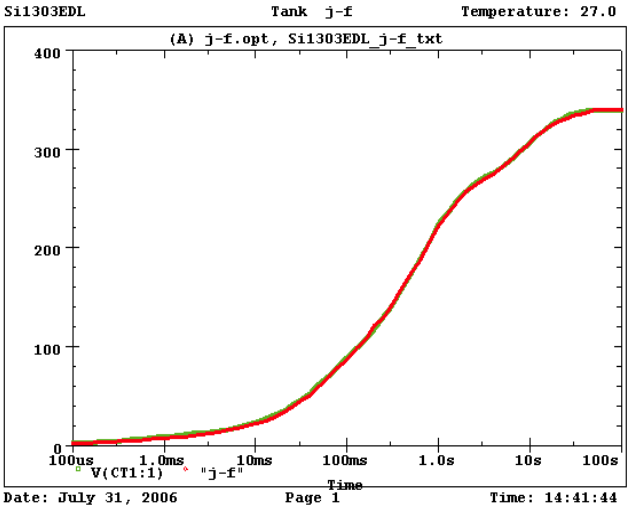
Time
Date: July 31, 2006
Page 1
Time: 14:04:20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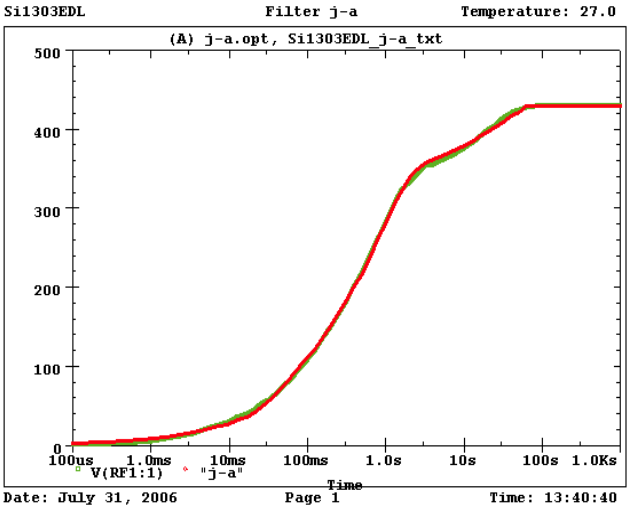
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Filter j-a
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300
200
100
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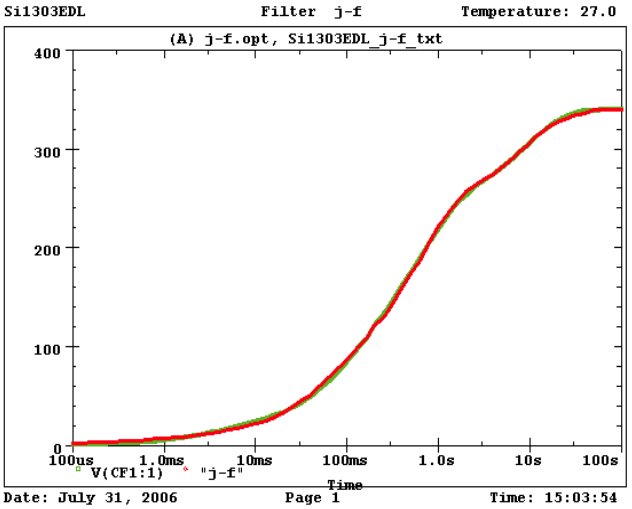
Page 1
Time: 13:40:40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300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
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Time
Date: July 31, 2006
Page 1
Time: 15:03:54