R-C Thermal Model Parameters

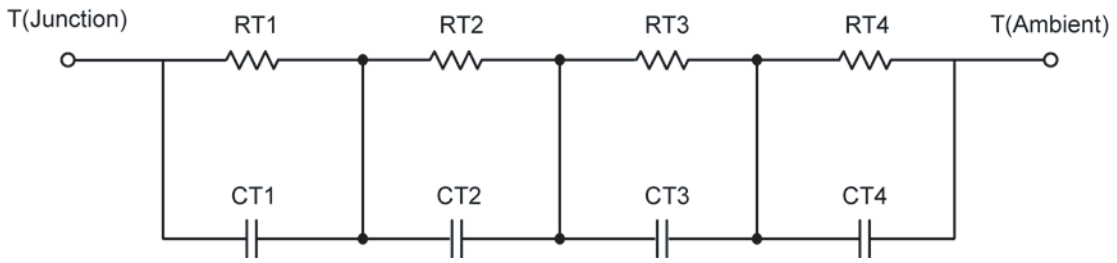
DESCRIPTION

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.

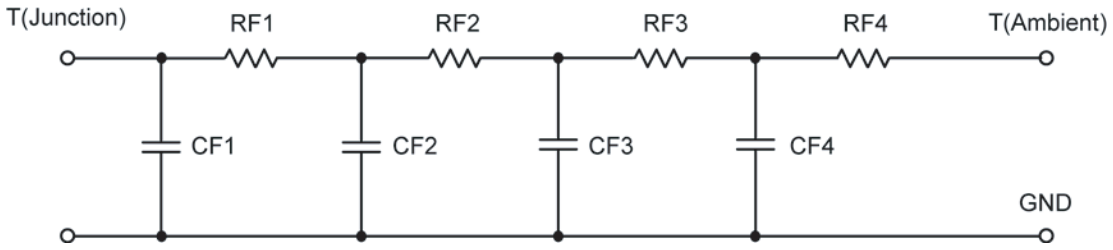
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	22.2455	N/A	7.0334
RT2	6.5433	N/A	900.0248 m
RT3	13.6916	N/A	6.0314
RT4	39.0314	N/A	8.9996
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	40.7641 m	N/A	38.9102 m
CT2	8.0789 m	N/A	1.0458 m
CT3	339.0512 m	N/A	12.1480 m
CT4	1.9953	N/A	234.8954 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

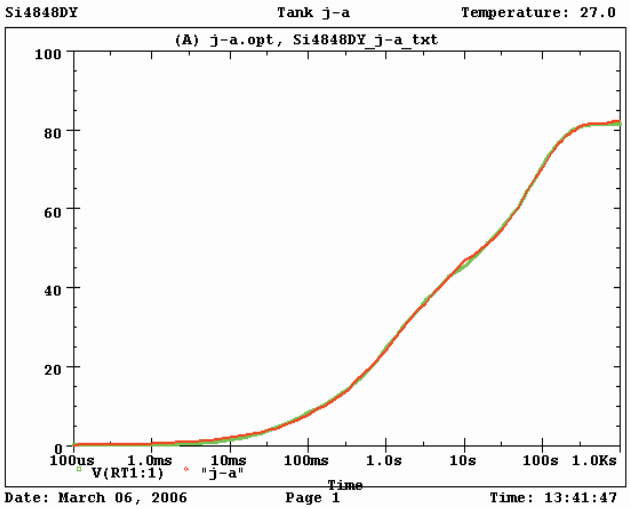


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.1752	N/A	1.8942
RF2	24.0627	N/A	10.6579
RF3	15.3329	N/A	5.9029
RF4	36.8248	N/A	4.5351
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.0704 m	N/A	1.8866 m
CF2	21.3609 m	N/A	8.7107 m
CF3	152.9699 m	N/A	79.0138 m
CF4	1.8083	N/A	412.1253 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
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60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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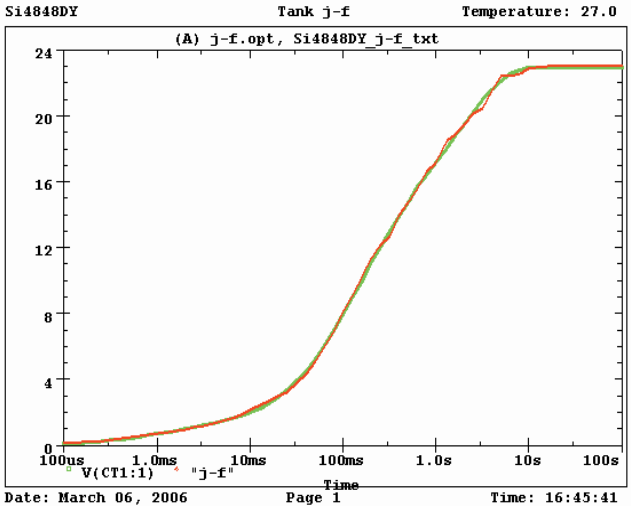
Time
Date: March 06, 2006
Page 1
Time: 13:41:47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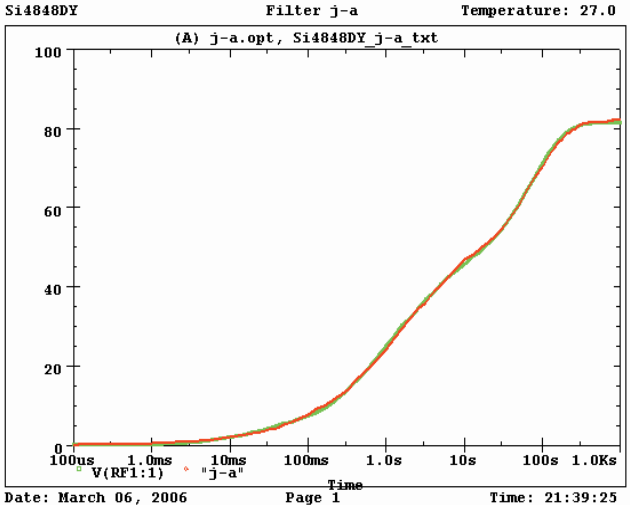
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Filter j-a
Temperature: 27.0
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60
40
20
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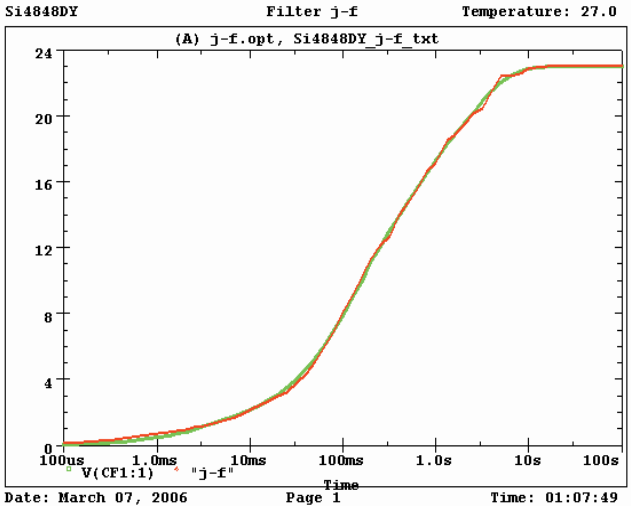
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Filter j-f
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20
16
12
8
4
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
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Time
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Page 1
Time: 01:07:49