R-C Thermal Model Parameters

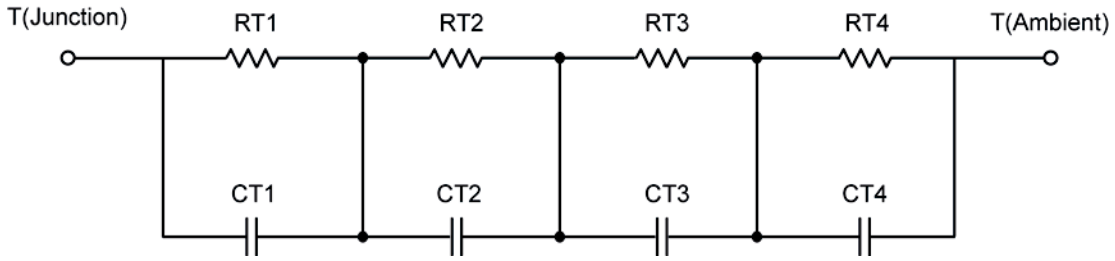
DESCRIPTION

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.

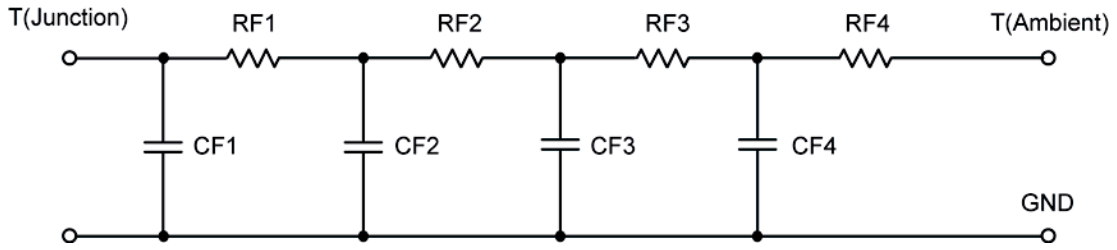
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	281.9587	N/A	57.8141
RT2	29.0518	N/A	23.6881
RT3	72.9070	N/A	132.3185
RT4	65.3672	N/A	125.8739
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	3.8018 m	N/A	853.9395 u
CT2	229.6449 u	N/A	128.9626 u
CT3	333.2771 m	N/A	7.9274 m
CT4	1.2137 m	N/A	5.9823 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

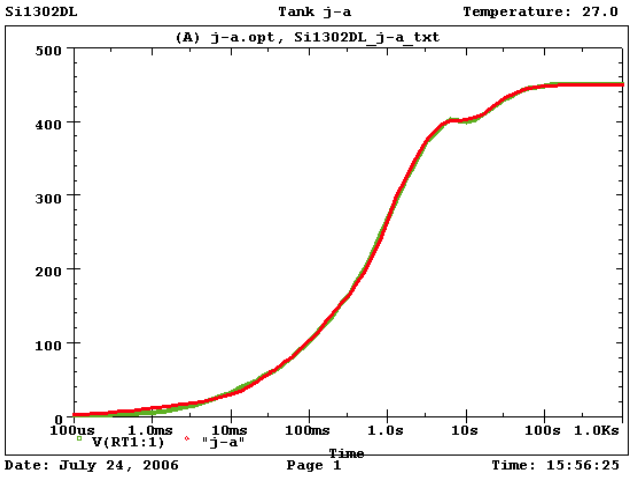


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.8261	N/A	27.4996
RF2	111.3119	N/A	98.3288
RF3	255.0369	N/A	109.4772
RF4	64.7462	N/A	104.8220
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	27.2015 u	N/A	79.3220 u
CF2	659.2253 u	N/A	707.2300 u
CF3	3.4930 m	N/A	2.9952 m
CF4	382.5828 m	N/A	2.1667 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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400
300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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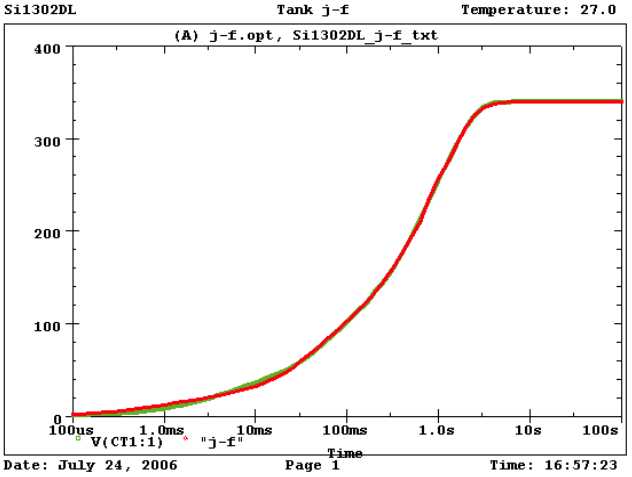
Time
Date: July 24, 2006
Page 1
Time: 15:56:25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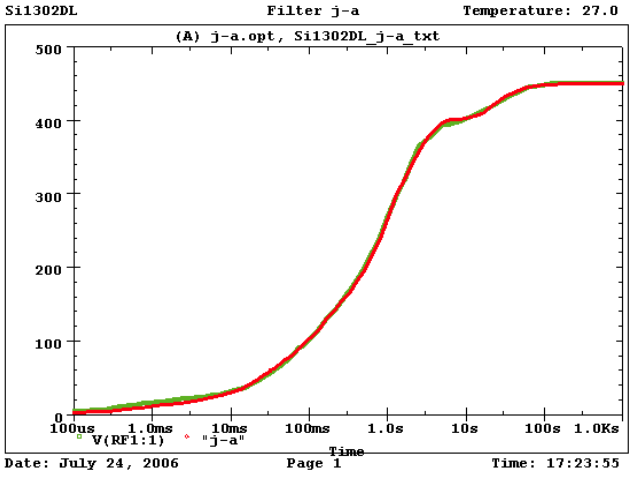
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300
200
100
0
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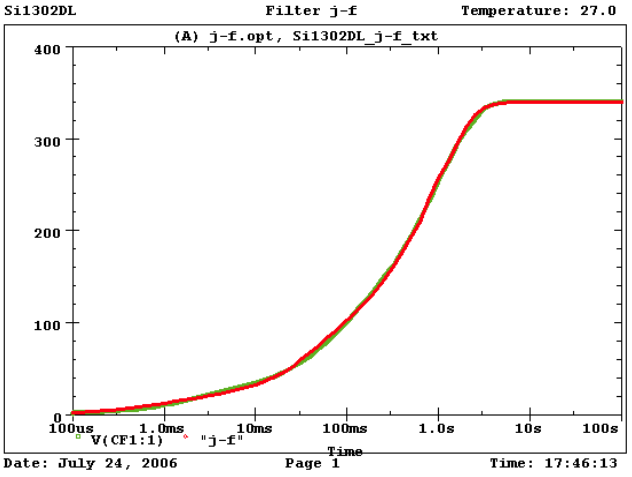
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Filter j-f
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300
200
100
0
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Time
Date: July 24, 2006
Page 1
Time: 17:46:13