R-C Thermal Model Parameters

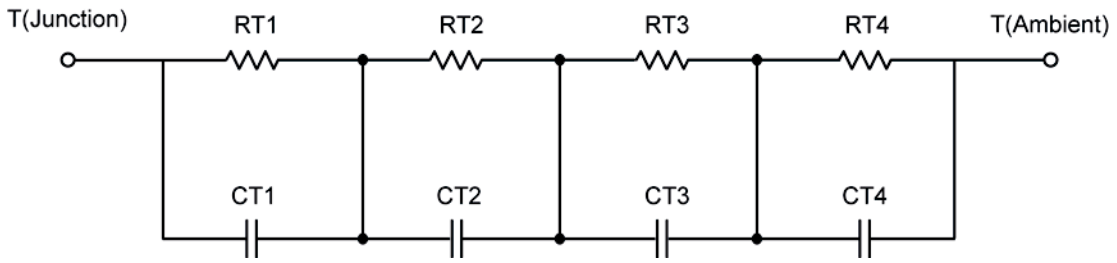
DESCRIPTION

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.

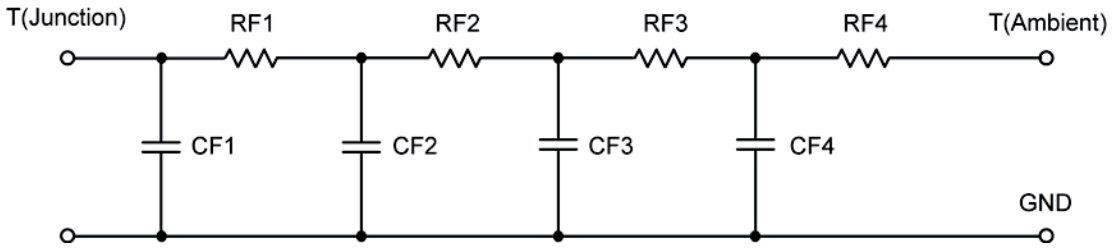
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.5628	N/A	4.3111
RT2	15.1066	N/A	4.5189
RT3	16.3180	N/A	6.0710
RT4	50.0126	N/A	13.0990
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.2387 m	N/A	2.9964 m
CT2	194.5908 m	N/A	19.3806 m
CT3	53.1843 m	N/A	35.8823 m
CT4	1.4393	N/A	93.7186 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

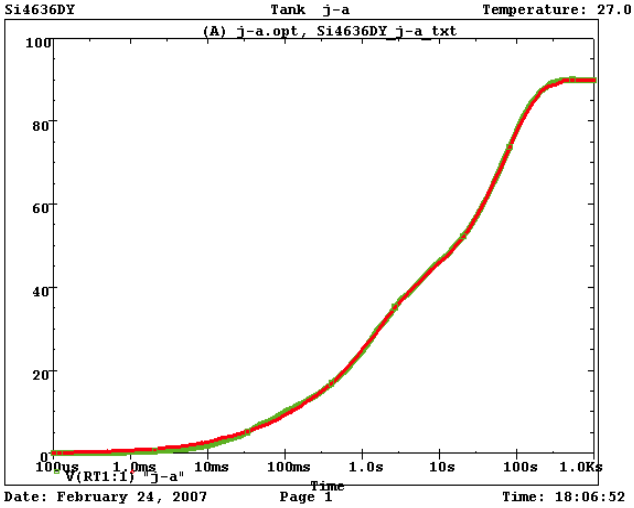


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.1998	N/A	2.7723
RF2	16.7783	N/A	12.1472
RF3	19.1285	N/A	5.7912
RF4	44.8934	N/A	7.2893
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.1965 m	N/A	1.2311 m
CF2	26.0063 m	N/A	6.2556 m
CF3	111.6508 m	N/A	43.3312 m
CF4	1.5282	N/A	107.9422 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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80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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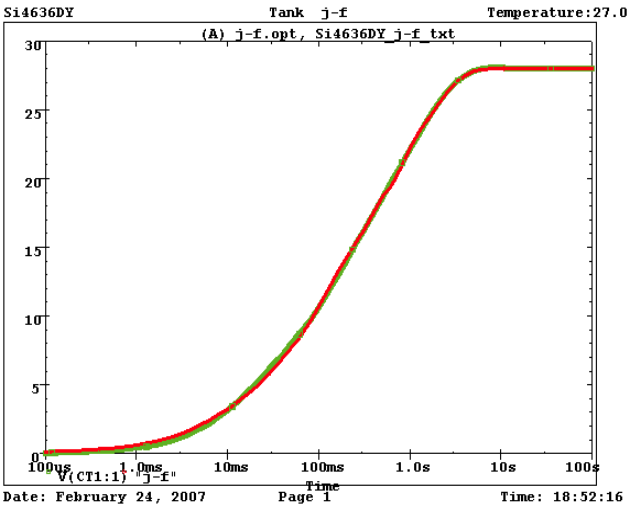
Time
Date: February 24, 2007
Page 1
Time: 18:06:52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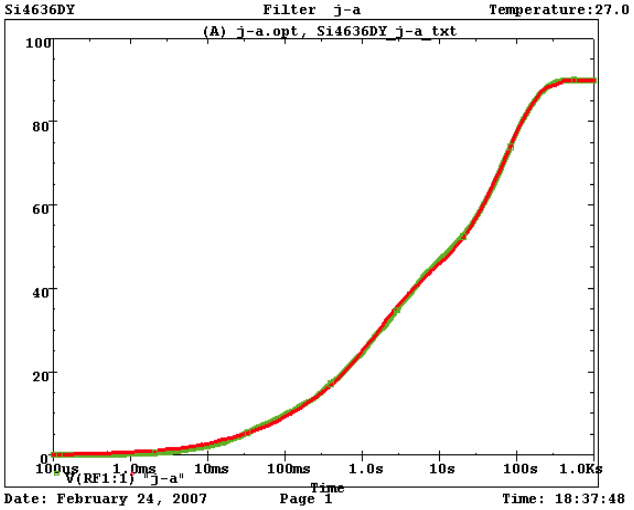
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Filter j-a
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60
40
20
0
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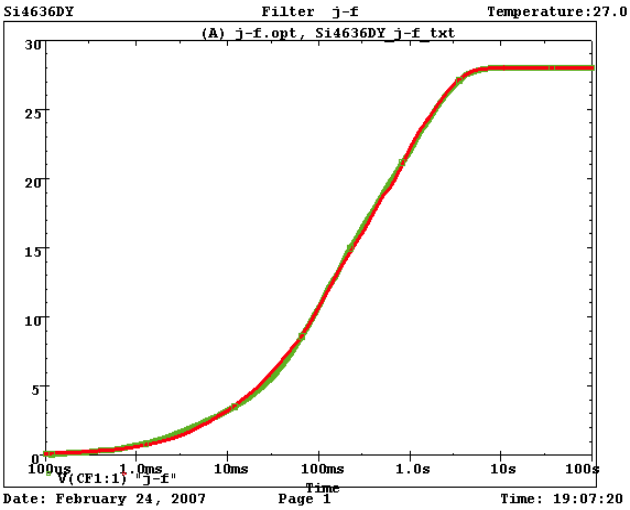
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Filter j-f
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25
20
15
10
5
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: February 24, 2007
Page 1
Time: 19:07:20