R-C Thermal Model Parameters

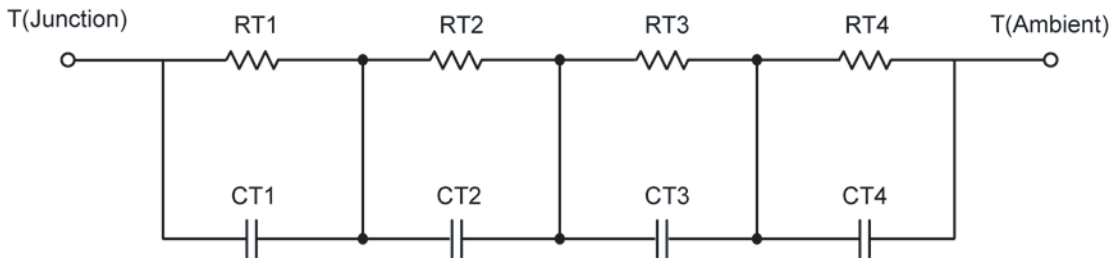
DESCRIPTION

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.

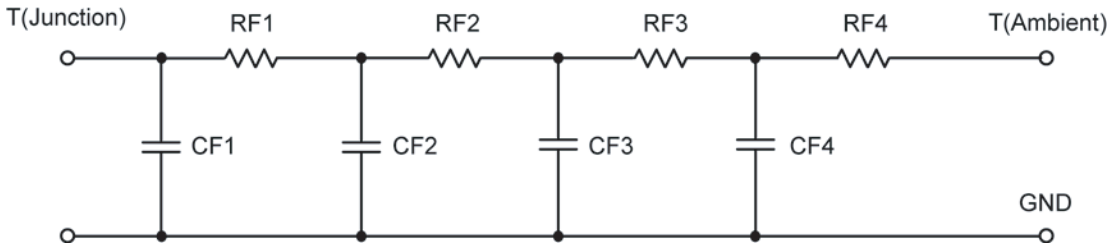
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.1485	N/A	8.9304
RT2	4.1521	N/A	1.5162
RT3	22.9344	N/A	2.3665
RT4	43.5098	N/A	8.1941
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	25.4527 m	N/A	8.8723 m
CT2	2.8451 m	N/A	596.8180 u
CT3	119.5623 m	N/A	1.3340
CT4	2.0081	N/A	122.7521 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

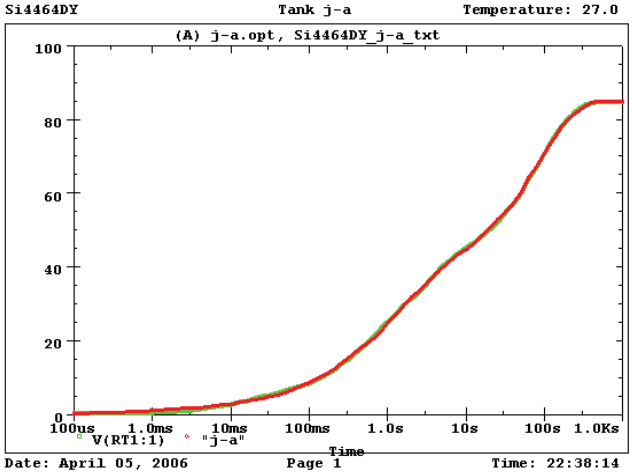


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.5565	N/A	1.5444
RF2	19.6836	N/A	9.7583
RF3	20.1722	N/A	7.2909
RF4	40.2650	N/A	2.4519
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.8142 m	N/A	524.9641 u
CF2	18.0387 m	N/A	7.2006 m
CF3	122.8158 m	N/A	92.2570 m
CF4	2.0098	N/A	720.1278 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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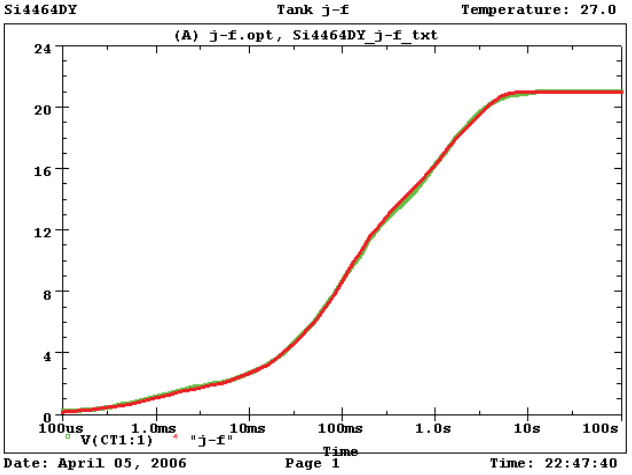
Time
Date: April 05, 2006
Page 1
Time: 22:38:14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12
8
4
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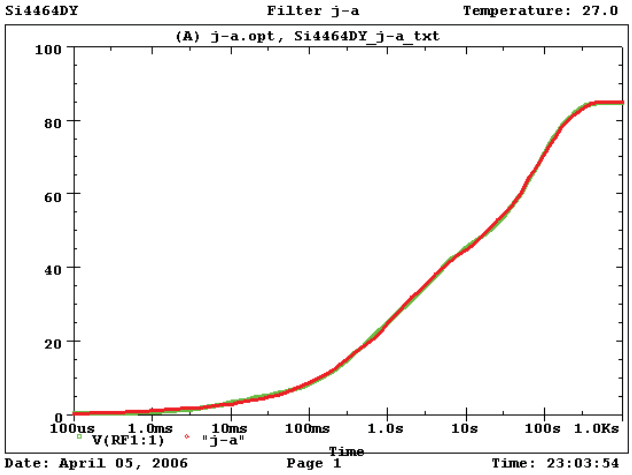
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Filter j-a
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60
40
20
0
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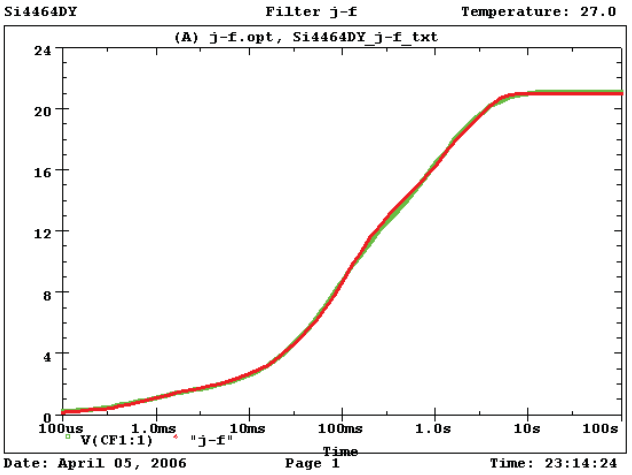
Si4464DY
Filter j-f
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20
16
12
8
4
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
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Time
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Page 1
Time: 23:14:24