R-C Thermal Model Parameters

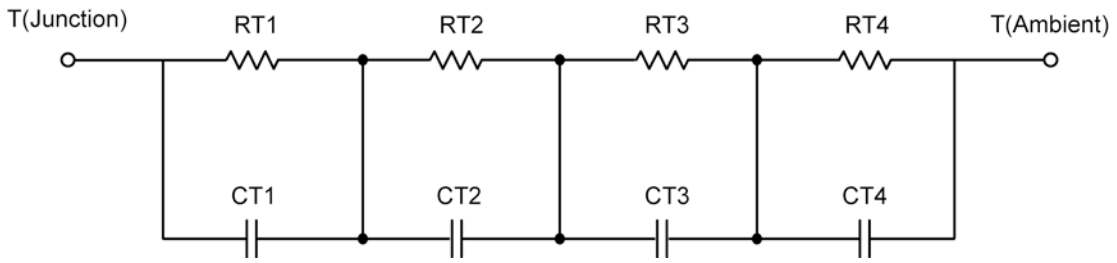
DESCRIPTION

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.

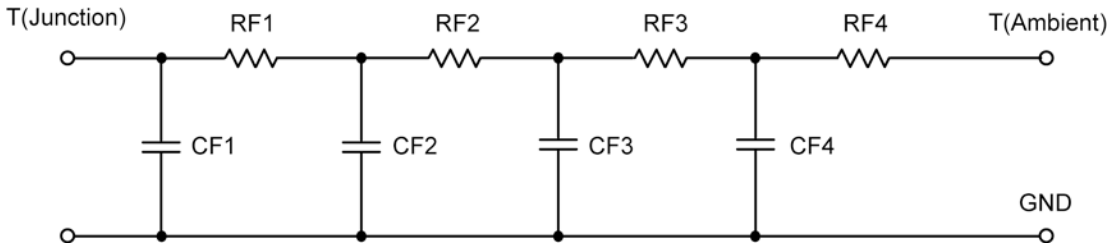
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	24.7202	17.0285	N/A
RT2	36.0217	10.9462	N/A
RT3	32.5543	302.0000 m	N/A
RT4	31.7038	11.7233	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	33.8005 u	236.4599 u	N/A
CT2	730.9573 m	575.8540 u	N/A
CT3	480.9535 u	677.7926 m	N/A
CT4	7.2586 m	41.2419 u	N/A

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

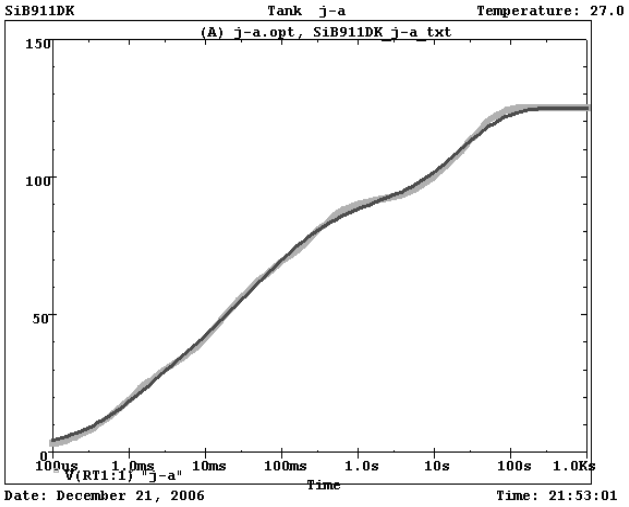


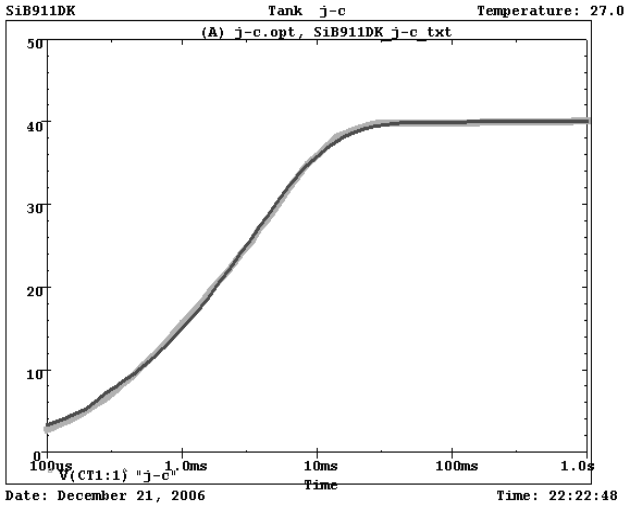
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	32.5774	14.8268	N/A
RF2	36.3650	19.3796	N/A
RF3	21.9662	5.6687	N/A
RF4	34.0914	124.9000 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	36.0236 u	29.3109 u	N/A
CF2	734.2795 u	123.6870 u	N/A
CF3	15.7342 m	813.3045 u	N/A
CF4	790.0923 m	278.1963 u	N/A

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


SiB911DK
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiB911DK_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: December 21, 2006
Time: 21:53:01


SiB911DK
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiB911DK_j-c_txt
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s
V(CT1:1) "j-c"
Time
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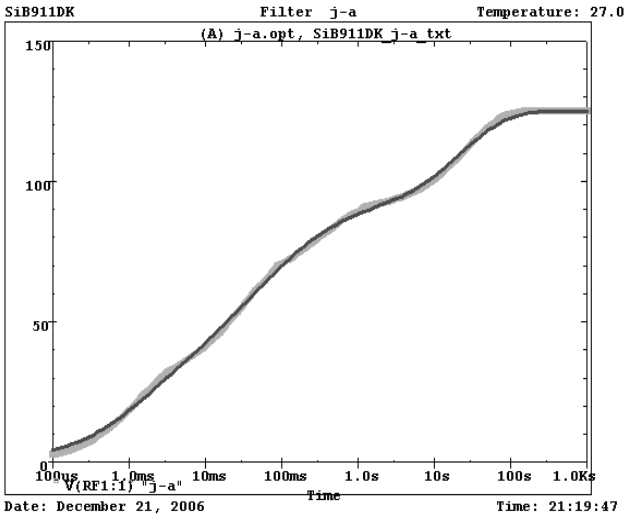
Time: 22:22:48


SiB911DK
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiB911DK_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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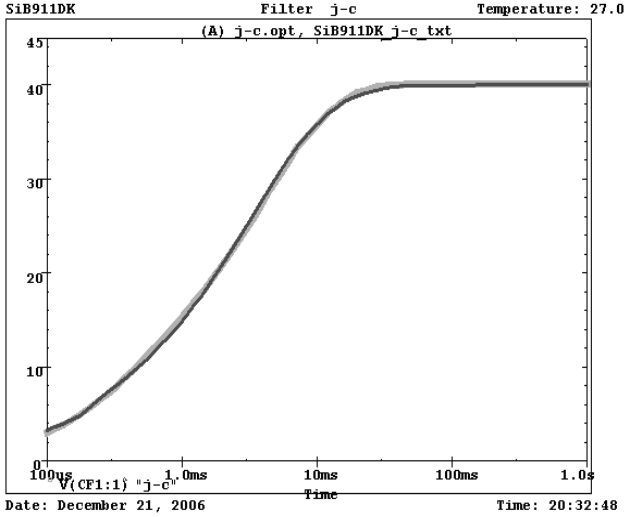
Time
Date: December 21, 2006
Time: 21:19:47


SiB911DK
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiB911DK_j-c_txt
45
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s
V(CF1:1) "j-c"
Time
Date: December 21, 2006
Time: 20:32:48