R-C Thermal Model Parameters

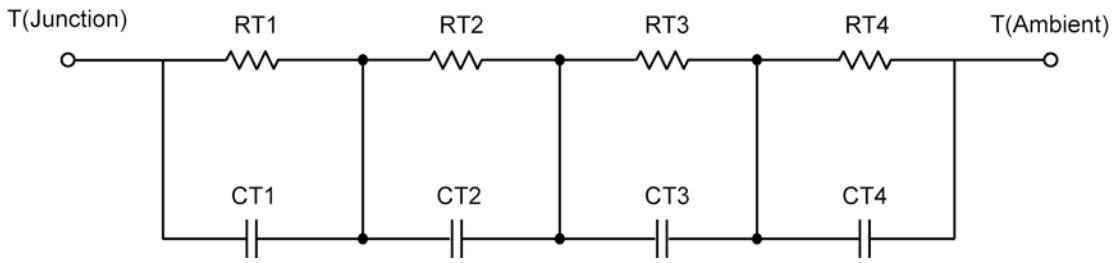
DESCRIPTION

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.

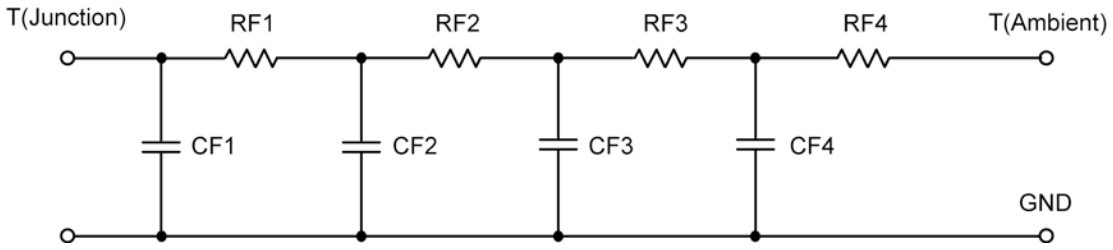
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	44.0773	N/A	86.4684
RT2	31.2189	N/A	127.1242
RT3	265.2248	N/A	117.3069
RT4	119.4790	N/A	19.1005
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.4079	N/A	572.6423 u
CT2	147.3951 u	N/A	5.2228 m
CT3	3.2833 m	N/A	2.8820 m
CT4	919.9911 u	N/A	44.2333 u

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

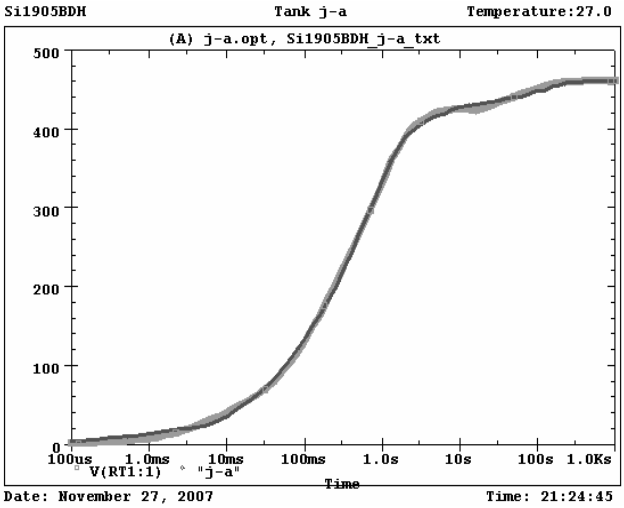


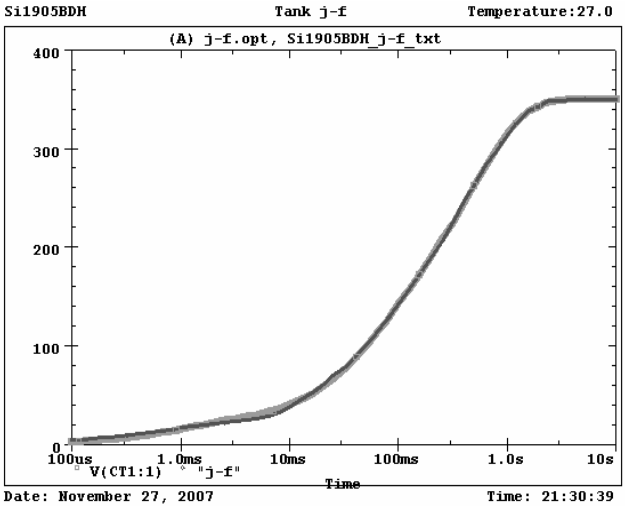
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	100.3782	N/A	20.1651
RF2	251.2865	N/A	146.1682
RF3	71.8884	N/A	133.4933
RF4	36.4469	N/A	50.1734
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	227.1993 u	N/A	41.8899 u
CF2	1.4212 m	N/A	388.0249 u
CF3	19.6820 m	N/A	2.2720 m
CF4	2.1078	N/A	133.3266 u

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


Si1905BDH
Tank j-a
Temperature:27.0
(A) j-a.opt, Si1905BDH_j-a_txt
500
400
300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: November 27, 2007
Time: 21:24:45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Tank j-f
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200
100
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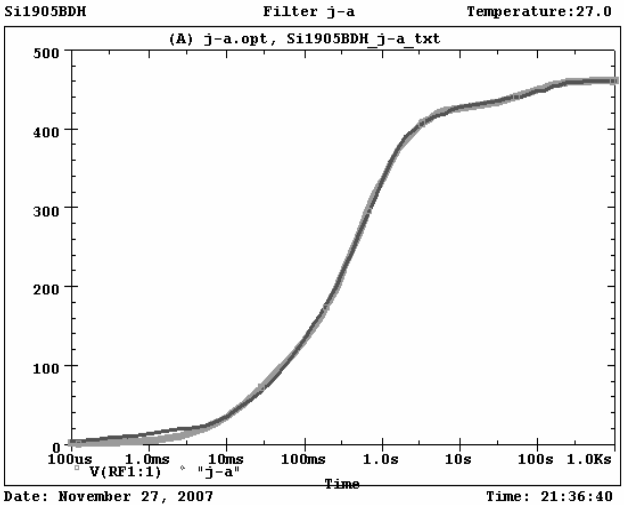
Si1905BDH
Filter j-a
Temperature:27.0
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400
300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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Time
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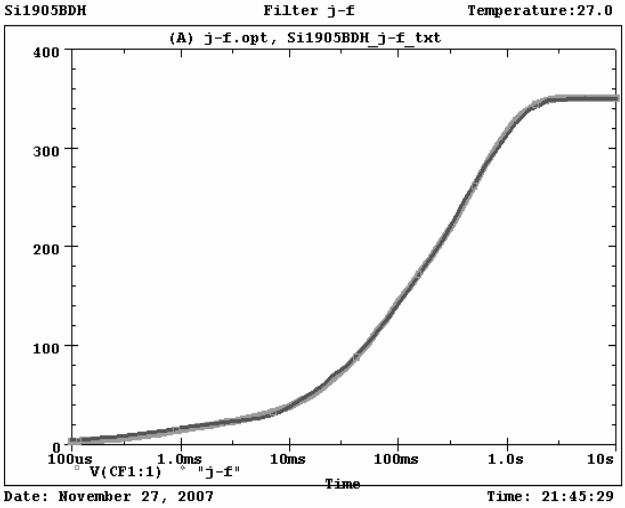
Time: 21:36:40


Si1905BDH
Filter j-f
Temperature:27.0
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300
200
100
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: November 27, 2007
Time: 21:45:29