R-C Thermal Model Parameters

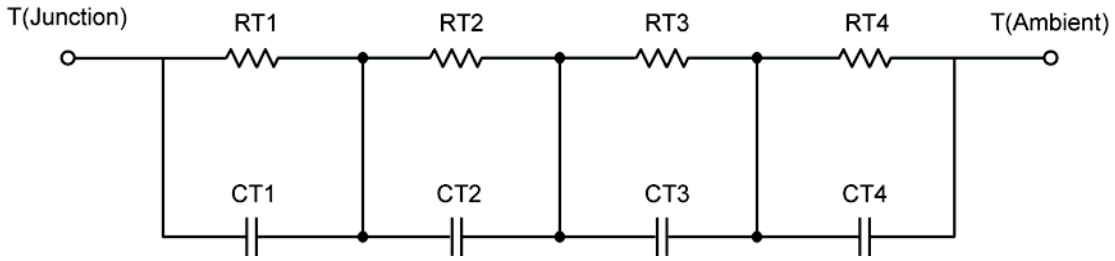
DESCRIPTION

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.

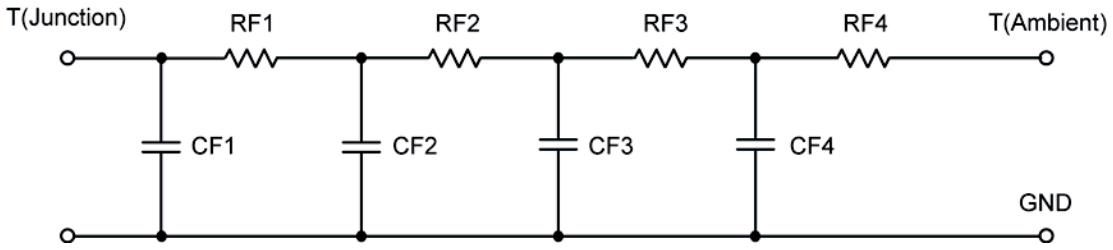
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.5905	N/A	12.8476
RT2	20.5159	N/A	6.6056
RT3	18.7424	N/A	5.4844
RT4	44.1513	N/A	15.0625
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	249.6930 u	N/A	1.5733 m
CT2	21.4094 m	N/A	179.1601 u
CT3	1.9557 m	N/A	111.2770 m
CT4	1.7424	N/A	3.5269 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

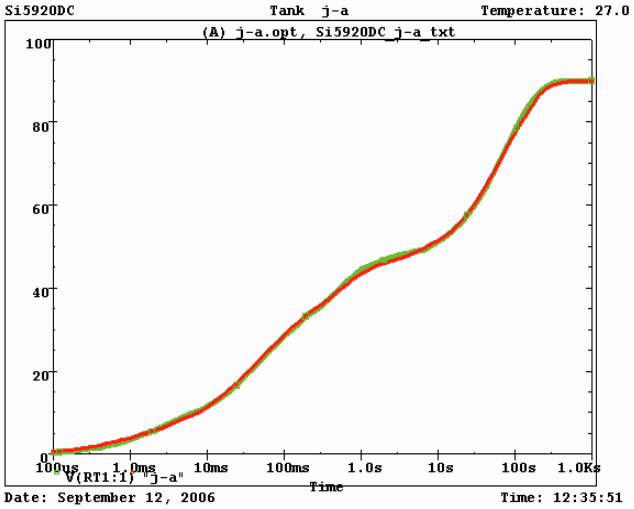


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	10.3889	N/A	7.6815
RF2	20.4038	N/A	17.9365
RF3	15.8355	N/A	10.7215
RF4	43.3719	N/A	3.6606
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	262.5988 u	N/A	158.5866 u
CF2	2.0086 m	N/A	695.4765 u
CF3	31.0523 m	N/A	4.1695 m
CF4	1.7791	N/A	133.6149 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


Si5920DC
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si5920DC_j-a_txt
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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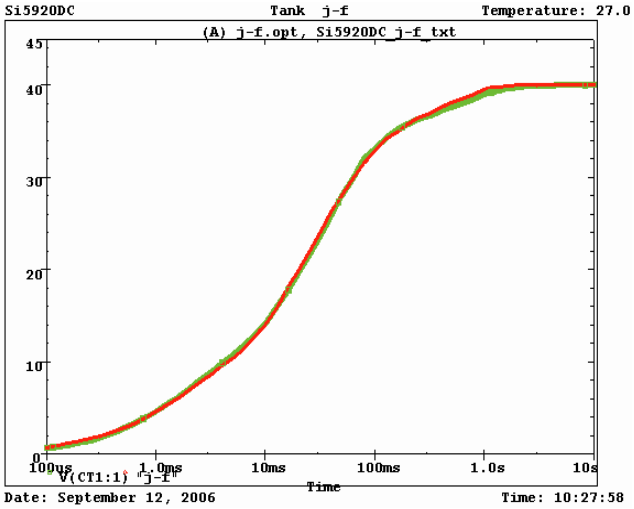
Time
Date: September 12, 2006
Time: 12:35:51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Tank j-f
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40
30
20
10
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Time
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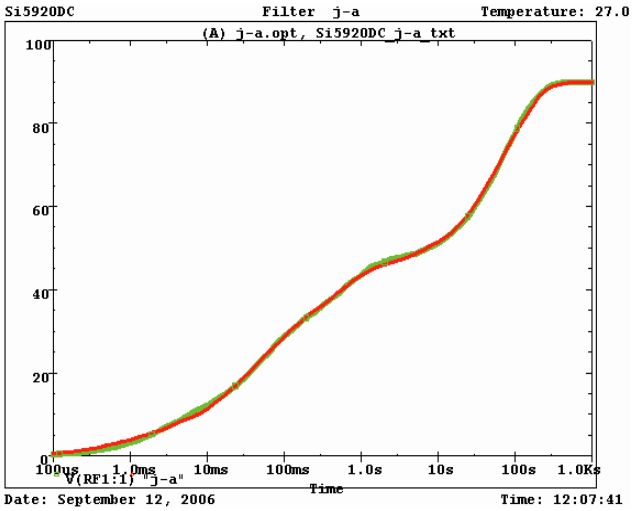
Si5920DC
Filter j-a
Temperature: 27.0
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80
60
40
20
0
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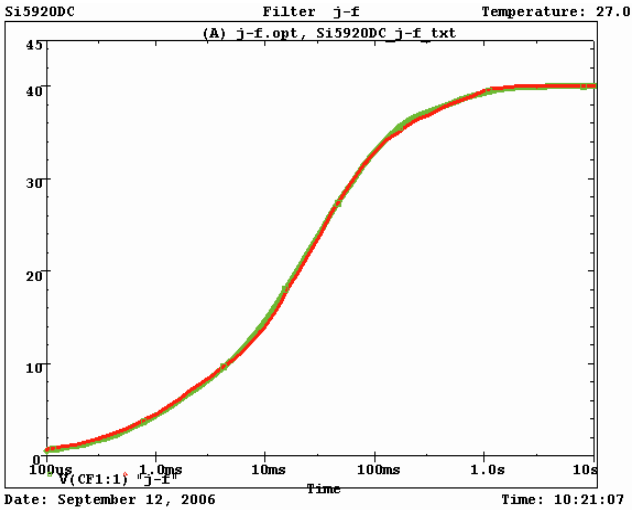
Date: September 12, 2006
Time: 12:07:41


Si5920DC
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si5920DC_j-f_txt
45
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: September 12, 2006
Time: 10:21:07