R-C Thermal Model Parameters

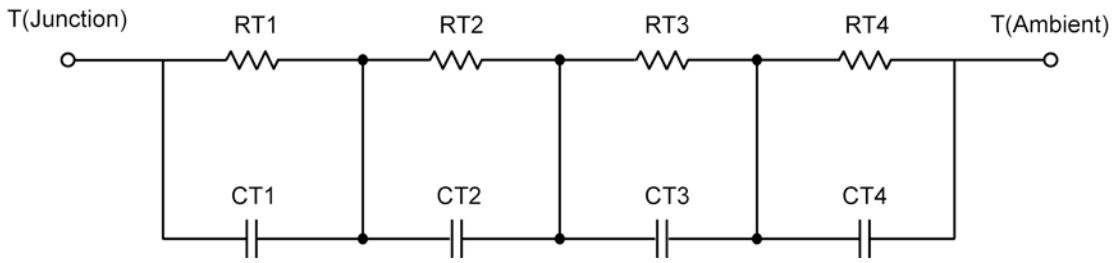
DESCRIPTION

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.

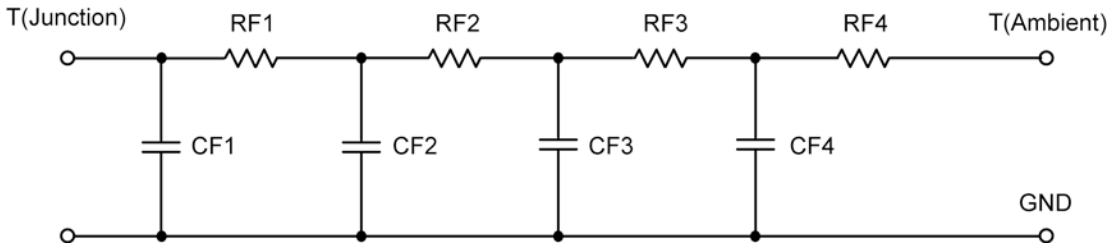
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	51.8371	N/A	3.0368
RT2	32.9815	N/A	17.7874
RT3	20.4166	N/A	391.9596 m
RT4	14.7648	N/A	783.8404 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2938	N/A	16.7404 m
CT2	46.6122 m	N/A	2.4901 m
CT3	4.1098 m	N/A	306.5161 m
CT4	6.6628 m	N/A	235.5190 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

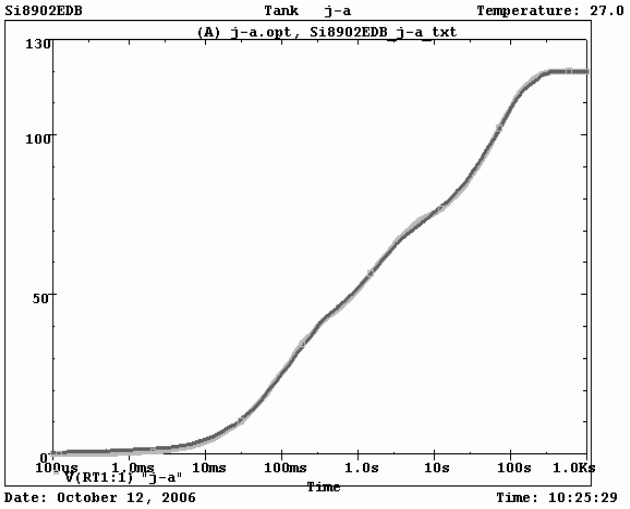


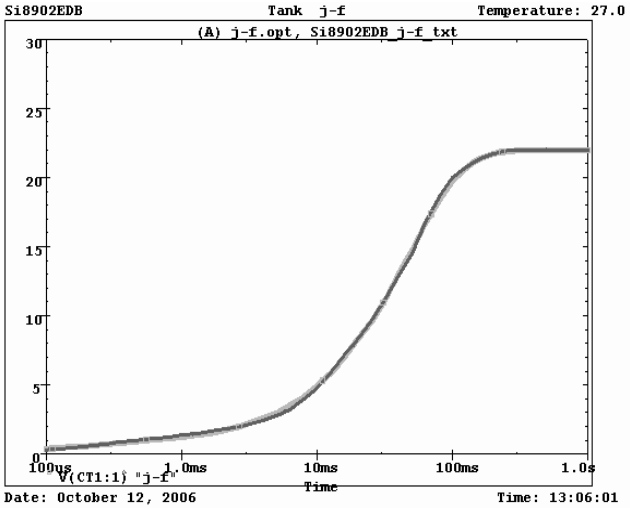
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	36.8615	N/A	1.5772
RF2	18.1056	N/A	19.3310
RF3	20.4094	N/A	962.6364 m
RF4	44.6235	N/A	129.1636 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.3438 m	N/A	674.5841 u
CF2	25.9526 m	N/A	1.5358 m
CF3	117.6861 m	N/A	2.7859 m
CF4	1.4677	N/A	51.7135 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


Si8902EDB
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si8902EDB_j-a_txt
130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: October 12, 2006
Time: 10:25:29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Tank j-f
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25
20
15
10
5
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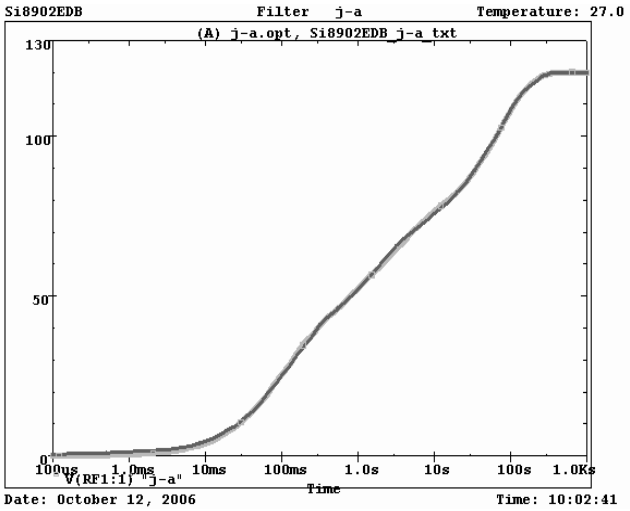
Si8902EDB
Filter j-a
Temperature: 27.0
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100
50
0
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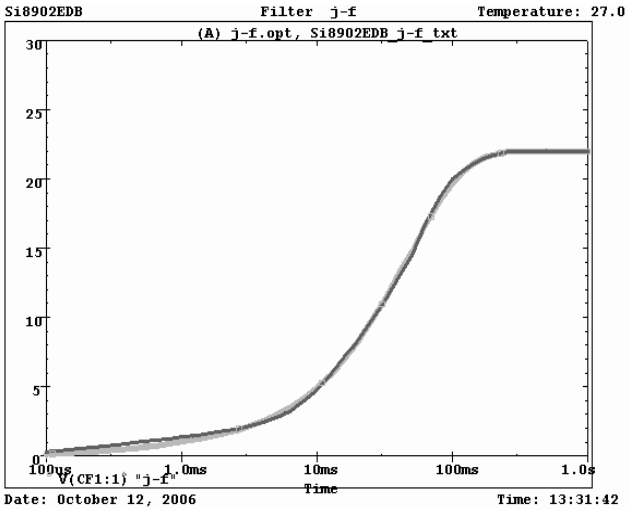
Si8902EDB
Filter j-f
Temperature: 27.0
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25
20
15
10
5
0
100us 1.0ms 10ms 100ms 1.0s
V(CF1:1) "j-f"
Time
Date: October 12, 2006
Time: 13:31:42