R-C Thermal Model Parameters

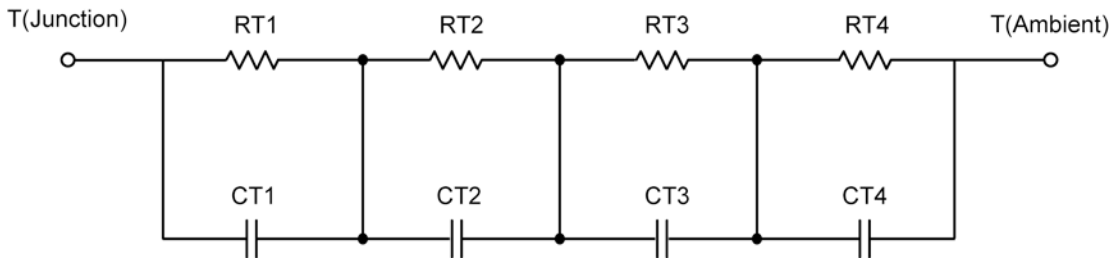
DESCRIPTION

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.

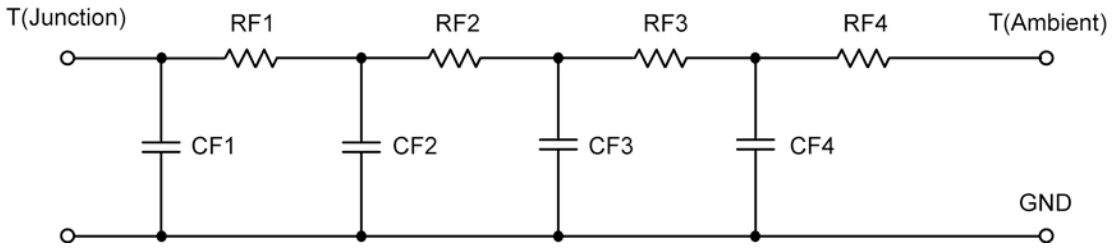
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	22.8642	N/A	15.7114
RT2	32.3160	N/A	11.1001
RT3	3.4885	N/A	2.7735
RT4	51.3313	N/A	7.4150
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.1663 m	N/A	128.4945 m
CT2	58.8820 m	N/A	8.0466 m
CT3	794.0542 u	N/A	573.1008 u
CT4	1.6539	N/A	30.7959 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

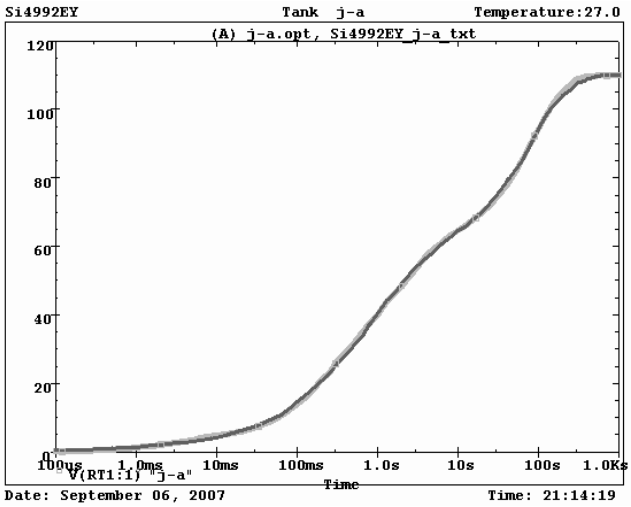


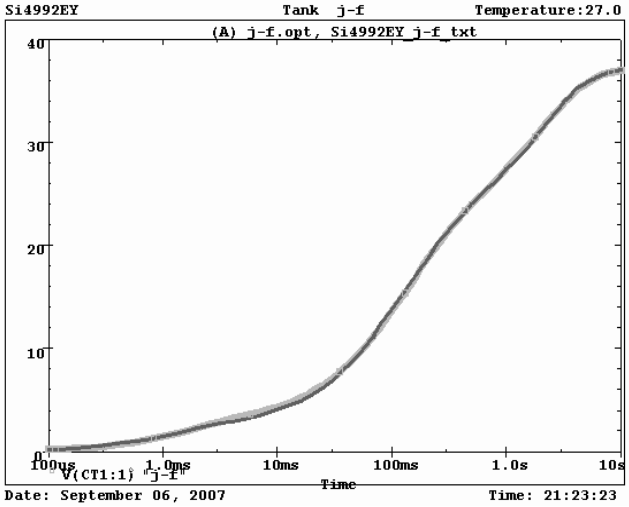
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.0654	N/A	3.3573
RF2	29.7470	N/A	18.7985
RF3	26.2871	N/A	11.8926
RF4	47.9005	N/A	2.9516
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.1556 m	N/A	512.9510 u
CF2	8.3486 m	N/A	6.0017 m
CF3	70.6858 m	N/A	112.4543 m
CF4	1.7500	N/A	272.1569 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


Si4992EY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4992EY_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: September 06, 2007
Time: 21:14:19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Tank j-f
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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Time
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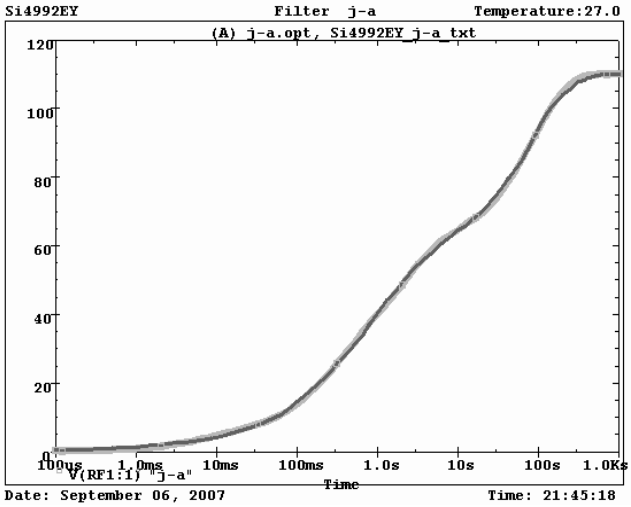
Time: 21:23:23


Si4992EY
Filter j-a
Temperature:27.0
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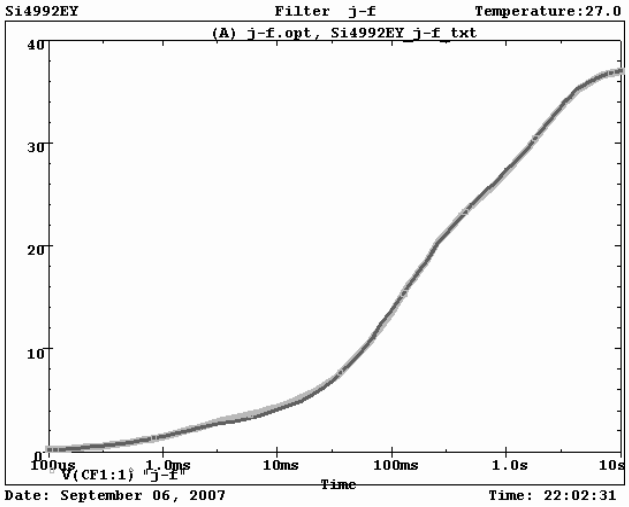
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: September 06, 2007
Time: 21:45:18


Si4992EY
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: September 06, 2007
Time: 22:02:31