R-C Thermal Model Parameters

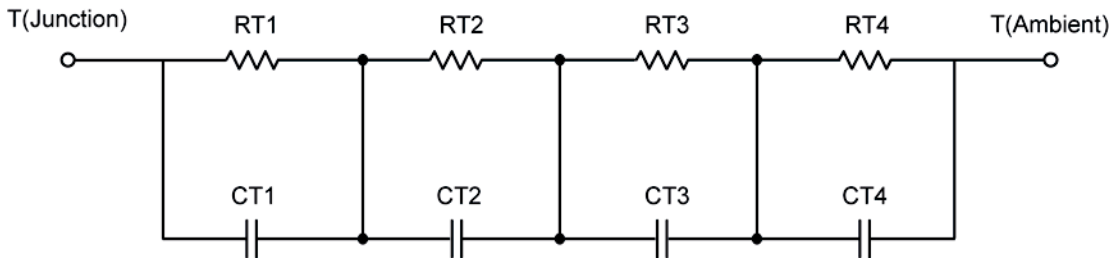
DESCRIPTION

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.

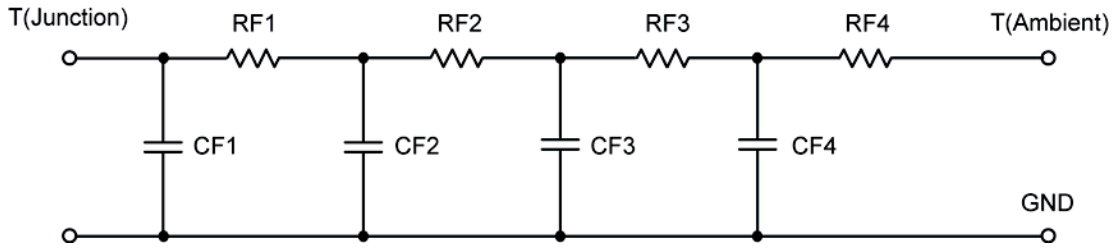
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	54.6598	N/A	48.1248
RT2	16.8142	N/A	12.9503
RT3	71.2893	N/A	8.6500
RT4	77.3114	N/A	30.2749
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2876	N/A	592.9211 u
CT2	41.6505 u	N/A	49.6255 u
CT3	8.5760 m	N/A	265.2869 m
CT4	646.3112 u	N/A	2.9450 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

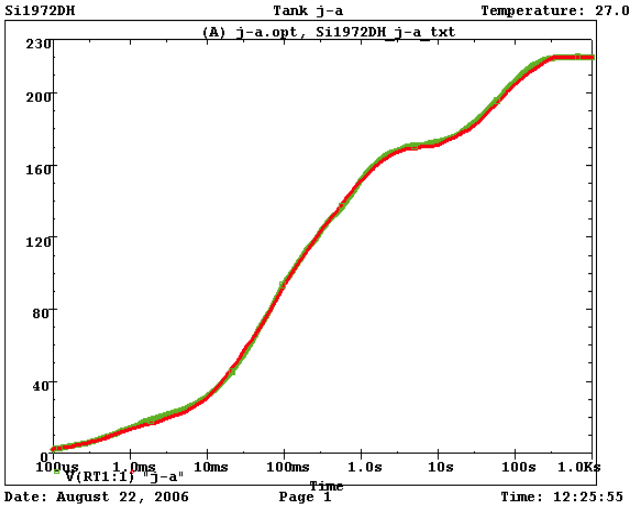


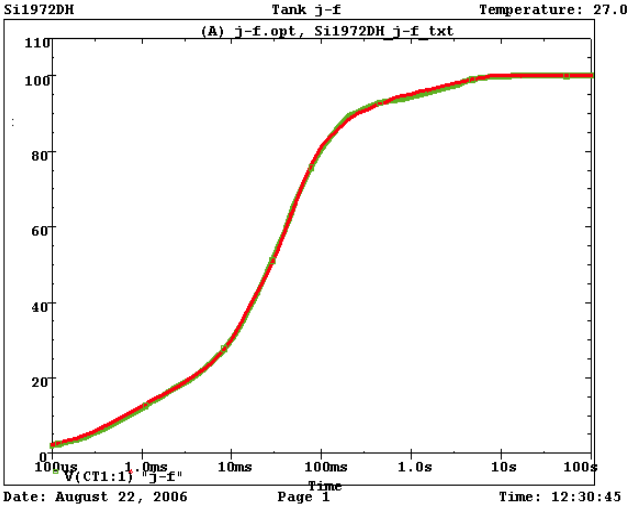
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	19.9328	N/A	15.0822
RF2	84.8053	N/A	69.9790
RF3	61.9463	N/A	627 m
RF4	53.3156	N/A	14.3211
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	50.2926 u	N/A	38.5493 u
CF2	552.5404 u	N/A	485.7156 u
CF3	8.9781 m	N/A	21.1471 m
CF4	1.3229	N/A	26.8661 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


Si1972DH
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si1972DH_j-a_txt
230
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: August 22, 2006
Page 1
Time: 12:25:55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Tank j-f
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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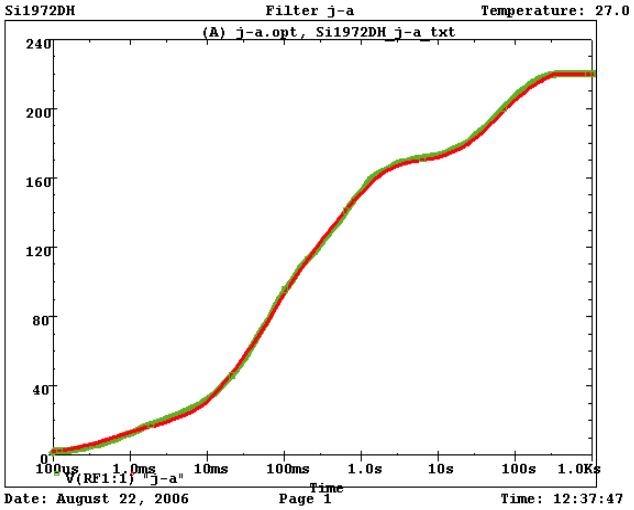
Time
Date: August 22, 2006
Page 1
Time: 12:30:45


Si1972DH
Filter j-a
Temperature: 27.0
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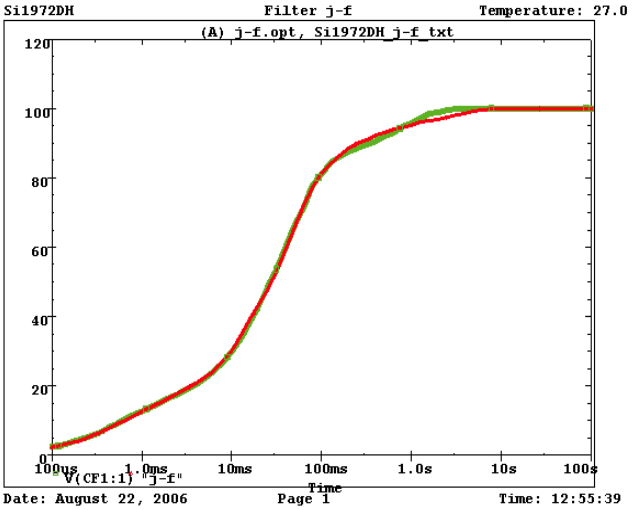
240
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: August 22, 2006
Page 1
Time: 12:37:47


Si1972DH
Filter j-f
Temperature: 27.0
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120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1) "j-f"
Time
Date: August 22, 2006
Page 1
Time: 12:55:39