R-C Thermal Model Parameters

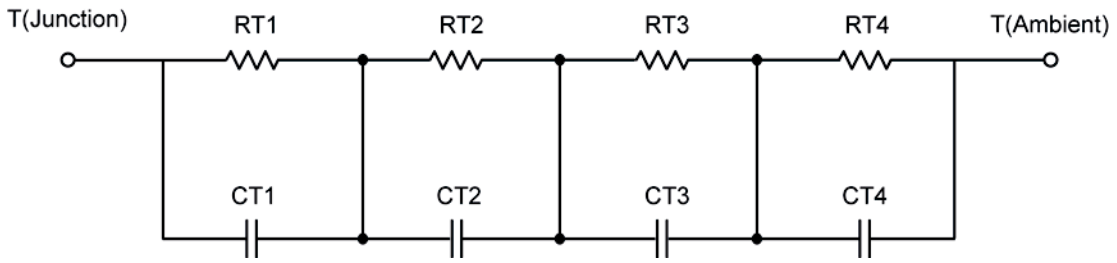
DESCRIPTION

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.

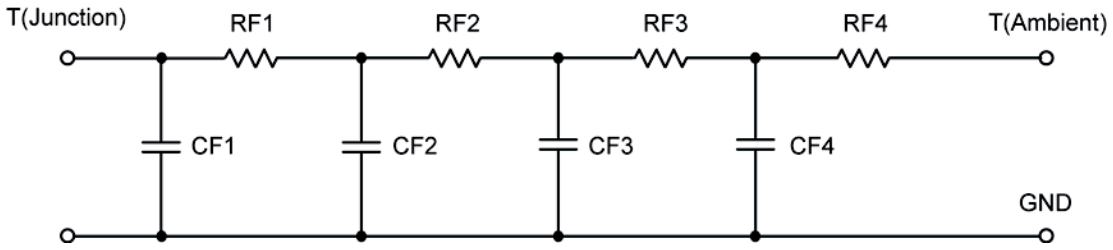
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.7568	N/A	3.0651
RT2	38.6781	N/A	43.8693
RT3	34.7951	N/A	11.3230
RT4	40.7699	N/A	11.7426
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3053 m	N/A	263.8942 u
CT2	38.5832 m	N/A	29.7486 m
CT3	24.6875 m	N/A	79.1707 m
CT4	1.6892	N/A	4.8454 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

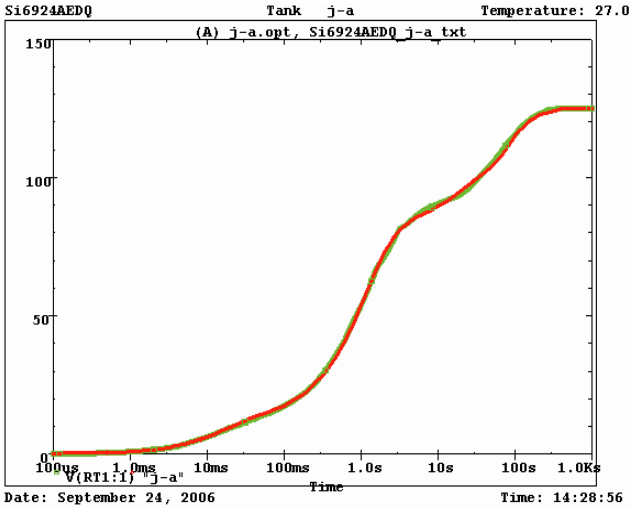


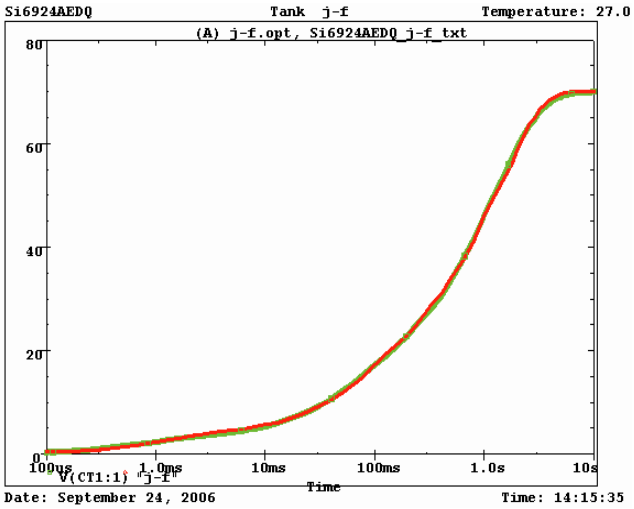
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.9187	N/A	4.2361
RF2	40.4017	N/A	18.1356
RF3	31.8717	N/A	19.8866
RF4	38.8080	N/A	27.7418
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.3348 m	N/A	283.8979 u
CF2	13.2984 m	N/A	4.4710 m
CF3	10.7206 m	N/A	18.4202 m
CF4	1.8651	N/A	6.8324 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


Si6924AEDQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6924AEDQ_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: September 24, 2006
Time: 14:28:56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Tank j-f
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40
20
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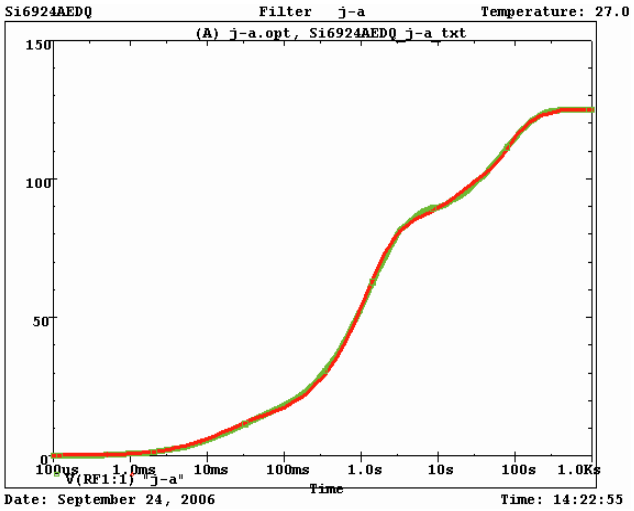
Si6924AEDQ
Filter j-a
Temperature: 27.0
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100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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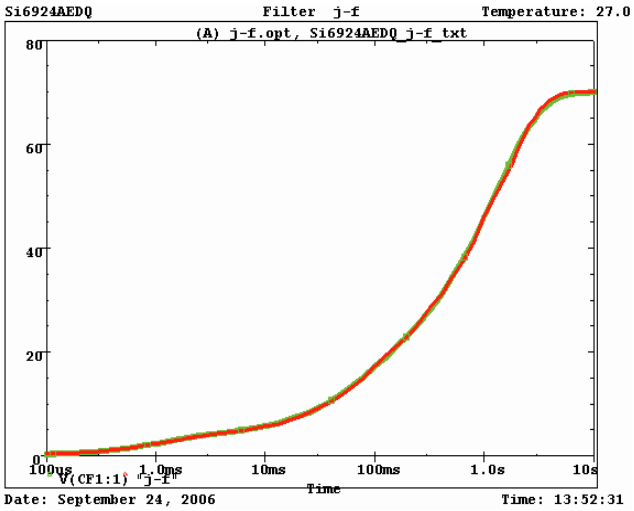
Time: 14:22:55


Si6924AEDQ
Filter j-f
Temperature: 27.0
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60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: September 24, 2006
Time: 13:52:31