R-C Thermal Model Parameters

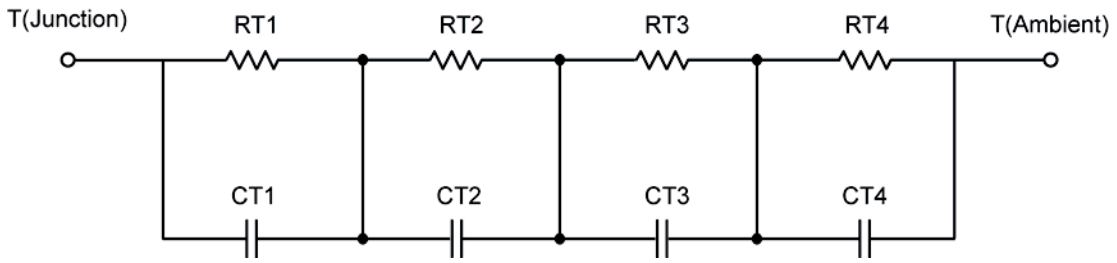
DESCRIPTION

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.

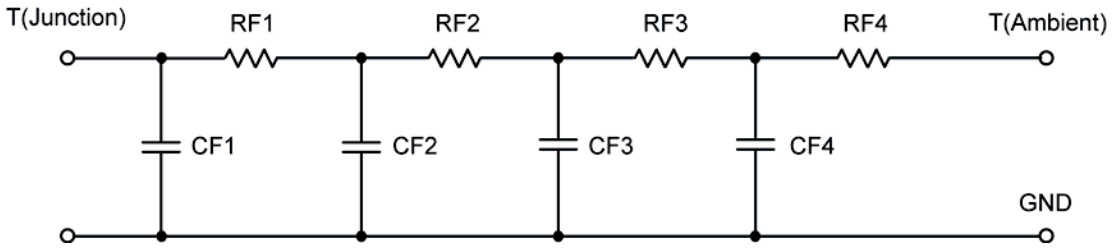
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.8529	N/A	3.4494
RT2	41.2600	N/A	28.8139
RT3	37.6450	N/A	17.1891
RT4	56.2420	N/A	15.5475
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	4.2330 m	N/A	1.2679 m
CT2	35.5212 m	N/A	39.6349 m
CT3	12.6468 m	N/A	11.9746 m
CT4	1.3775	N/A	11.3457 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

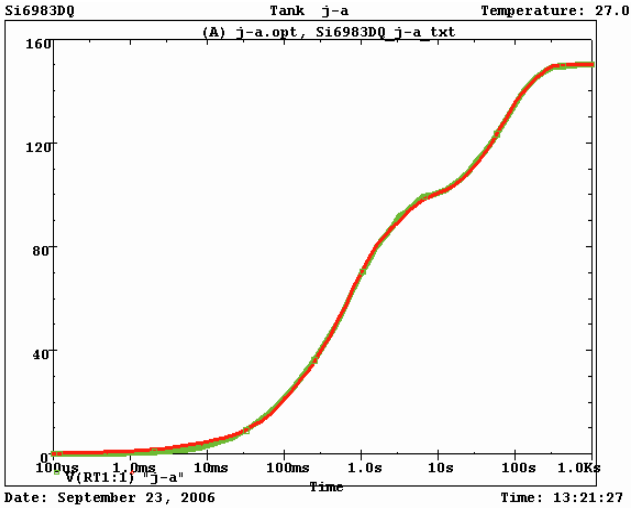


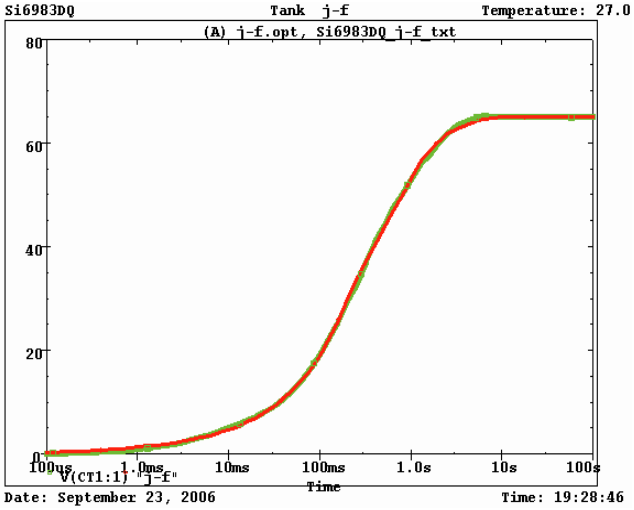
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	21.5898	N/A	15.2167
RF2	35.7462	N/A	22.5989
RF3	36.9213	N/A	13.2464
RF4	55.7426	N/A	13.9380
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.6552 m	N/A	2.2692 m
CF2	4.6291 m	N/A	4.8960 m
CF3	17.5964 m	N/A	3.8677 m
CF4	1.3224	N/A	74.9097 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


Si6983DQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6983DQ_j-a_txt
160
120
80
40
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: September 23, 2006
Time: 13:21:27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Tank j-f
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40
20
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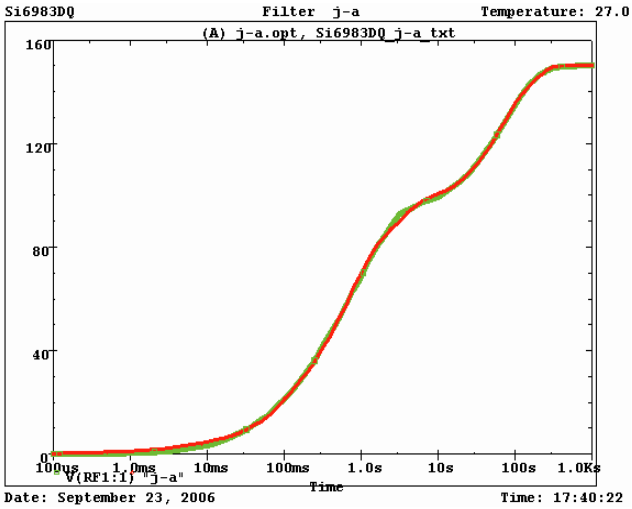
Si6983DQ
Filter j-a
Temperature: 27.0
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120
80
40
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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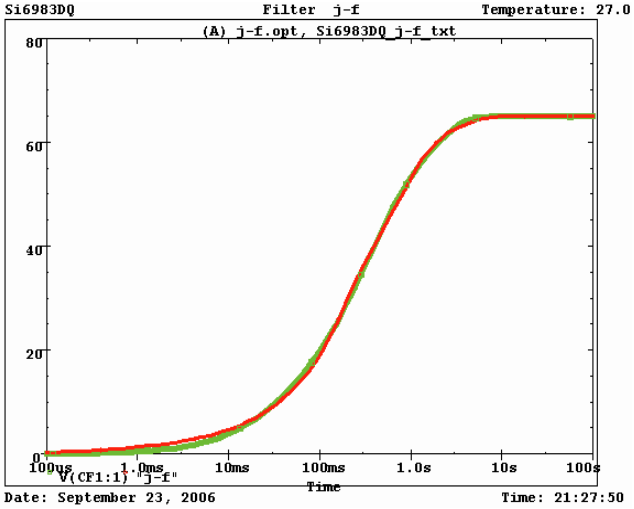
Time: 17:40:22


Si6983DQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6983DQ_j-f_txt
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60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: September 23, 2006
Time: 21:27:50