R-C Thermal Model Parameters

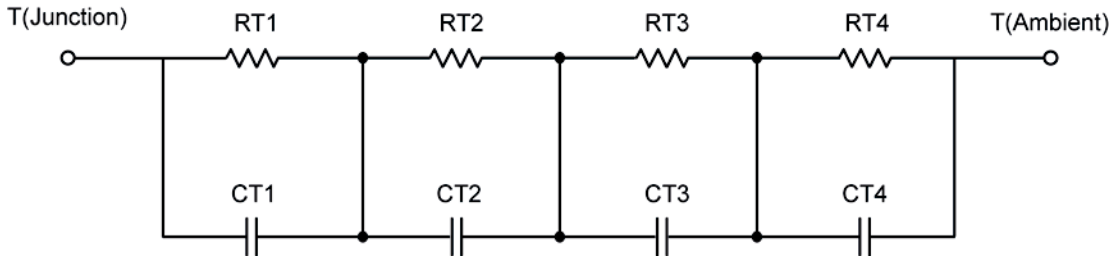
DESCRIPTION

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.

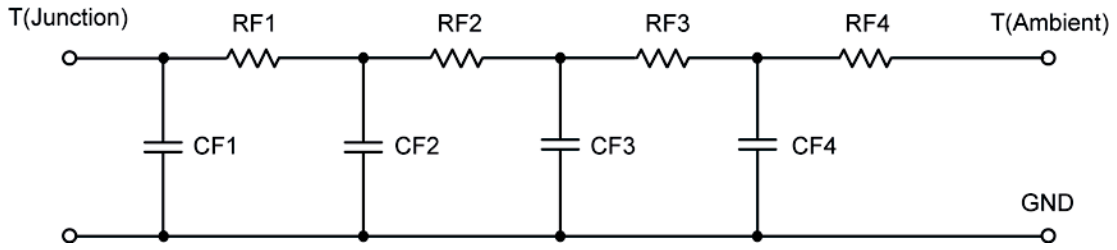
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	24.8736	N/A	28.5067
RT2	6.8016	N/A	15.2315
RT3	70.9289	N/A	33.3805
RT4	47.3959	N/A	2.8813
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.8589 m	N/A	11.2005 m
CT2	1.8241 m	N/A	3.9988 m
CT3	14.1363 m	N/A	30.6373 m
CT4	1.6678	N/A	434.1574 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

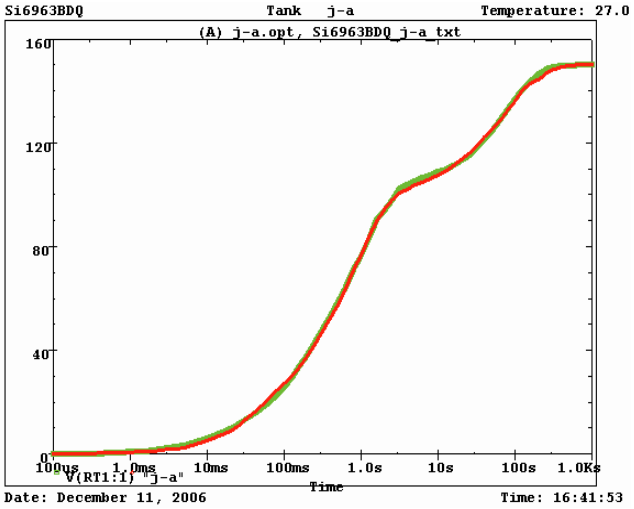


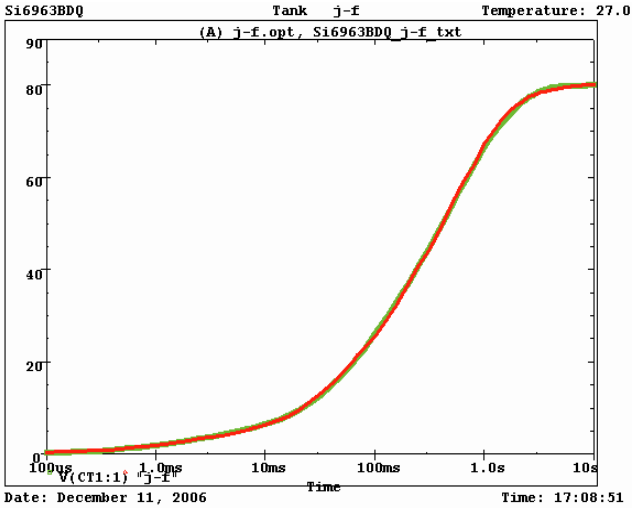
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.1299	N/A	3.7502
RF2	40.2959	N/A	26.0342
RF3	44.5423	N/A	28.9295
RF4	47.0319	N/A	21.2861
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.3357 m	N/A	347.1420 u
CF2	4.9577 m	N/A	2.1365 m
CF3	10.2156 m	N/A	7.0796 m
CF4	1.5908	N/A	17.1357 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


Si6963BDQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6963BDQ_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: December 11, 2006
Time: 16:41:53


Si6963BDQ
Tank j-f
Temperature: 27.0
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80
60
40
20
0
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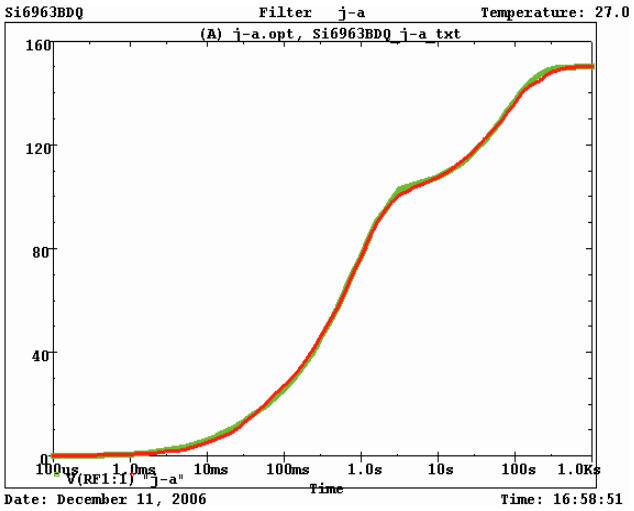
Si6963BDQ
Filter j-a
Temperature: 27.0
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120
80
40
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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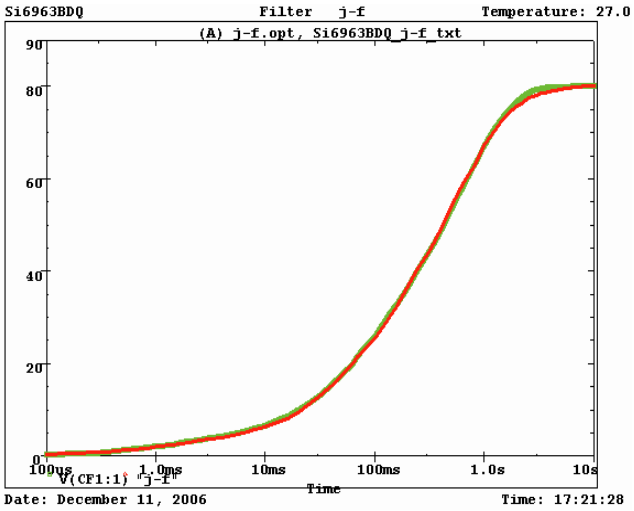
Time: 16:58:51


Si6963BDQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6963BDQ_j-f_txt
90
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: December 11, 2006
Time: 17:21:28