R-C Thermal Model Parameters

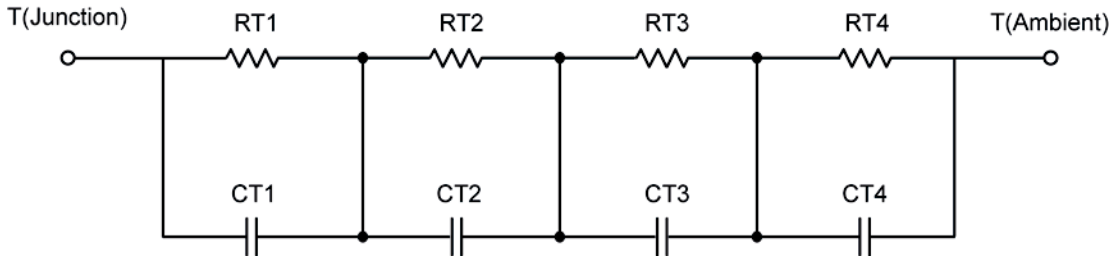
DESCRIPTION

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.

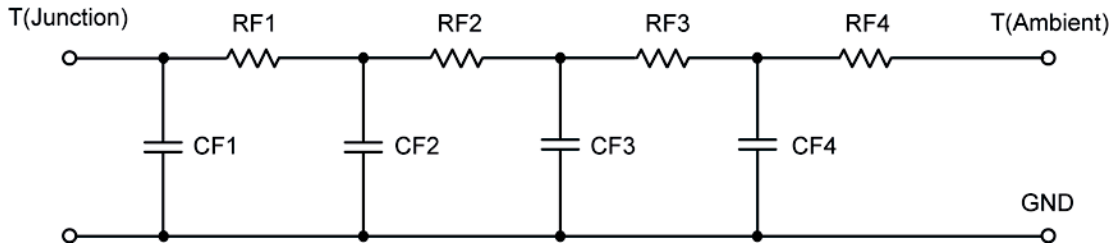
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	39.9625	N/A	21.8497
RT2	11.0051	N/A	12.9854
RT3	42.2521	N/A	28.0161
RT4	56.7803	N/A	2.1488
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.4804 m	N/A	11.0871 m
CT2	3.4453 m	N/A	8.3414 m
CT3	37.0970 m	N/A	38.4727 m
CT4	1.6722	N/A	785.5740 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

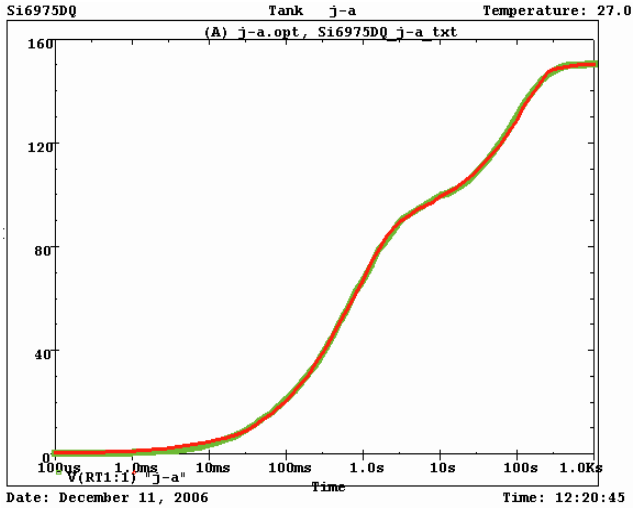


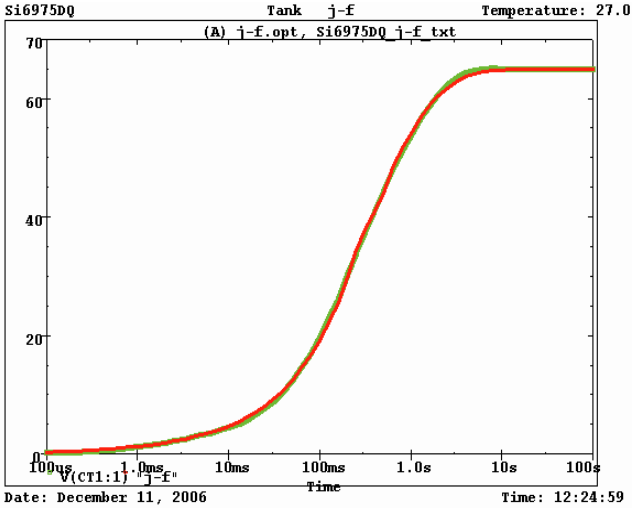
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	26.9016	N/A	6.5080
RF2	37.0018	N/A	24.6764
RF3	30.6657	N/A	25.0183
RF4	55.4309	N/A	8.7973
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.8509 m	N/A	1.4427 m
CF2	6.8182 m	N/A	3.1446 m
CF3	24.9141 m	N/A	7.4743 m
CF4	1.6709	N/A	177.3414 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


Si6975DQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6975DQ_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: 12:20:45


Si6975DQ
Tank j-f
Temperature: 27.0
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60
40
20
0
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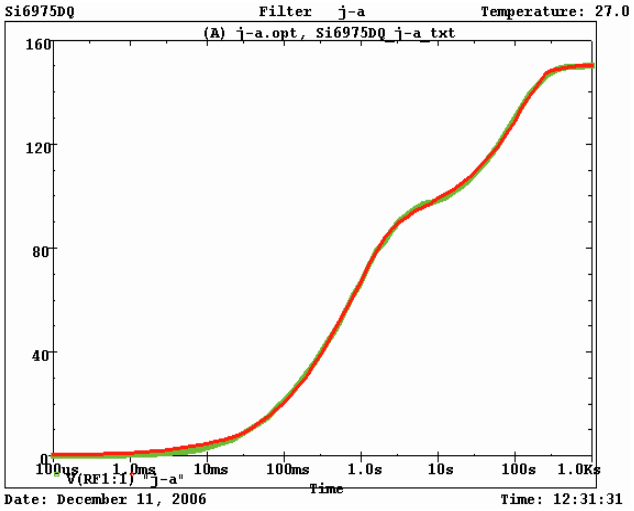
Time: 12:24:59


Si6975DQ
Filter j-a
Temperature: 27.0
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160
120
80
40
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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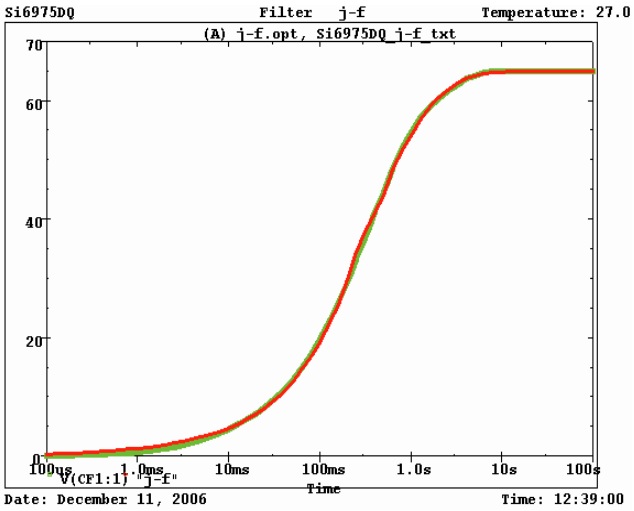
Time: 12:31:31


Si6975DQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6975DQ_j-f_txt
70
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: December 11, 2006
Time: 12:39:00