R-C Thermal Model Parameters

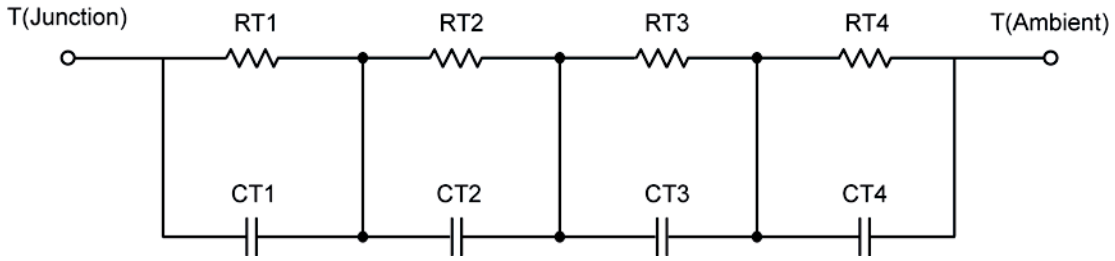
DESCRIPTION

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.

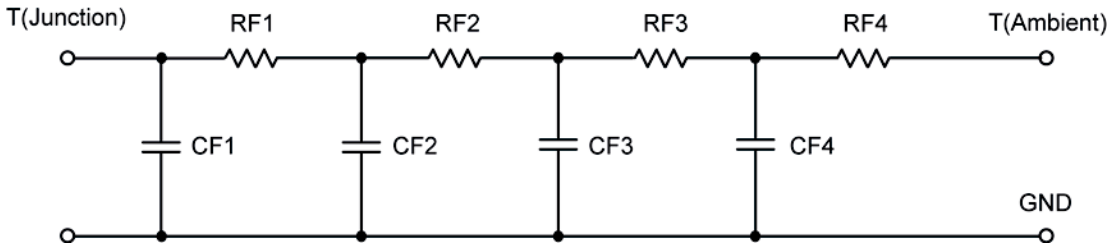
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	15.6312	43.9707 m	N/A
RT2	40.8698	1.2169	N/A
RT3	21.7919	321.0293 m	N/A
RT4	6.7071	1.1181	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	72.2258 m	24.4063 m	N/A
CT2	1.9882	1.2080 m	N/A
CT3	1.3539	2.1222	N/A
CT4	6.7570 m	12.5919 m	N/A

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

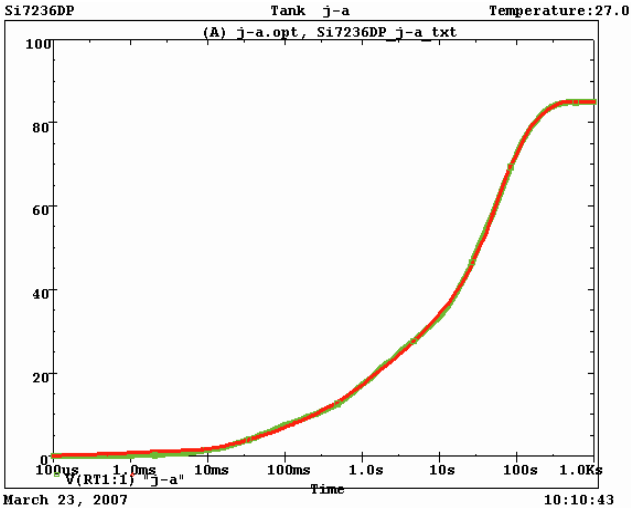


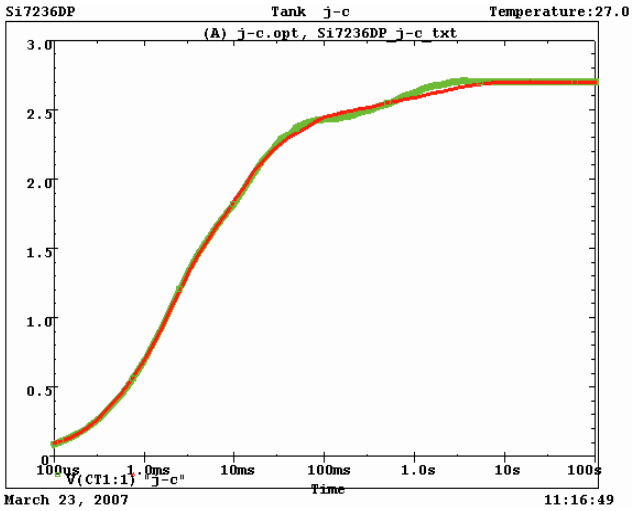
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.1626	1.5045	N/A
RF2	14.4537	123.6809 m	N/A
RF3	15.8360	819.1907 m	N/A
RF4	47.5477	252.6284 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.4167 m	1.0552 m	N/A
CF2	49.2744 m	14.4672 m	N/A
CF3	358.5101 m	2.9659 m	N/A
CF4	902.0871 m	3.5436	N/A

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


Si7236DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7236DP_j-a_txt
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
March 23, 2007
10:10:43


Si7236DP
Tank j-c
Temperature:27.0
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3.0
2.5
2.0
1.5
1.0
0.5
0
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V(CT1:1) "j-c"
Time
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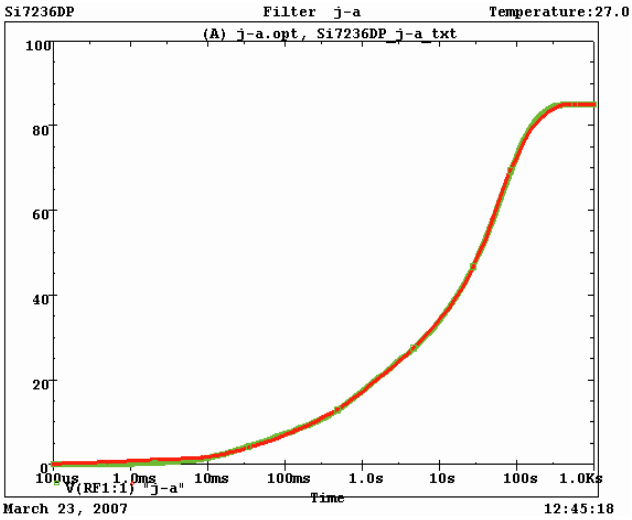
11:16:49


Si7236DP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7236DP_j-a_txt
100
80
60
40
20
0
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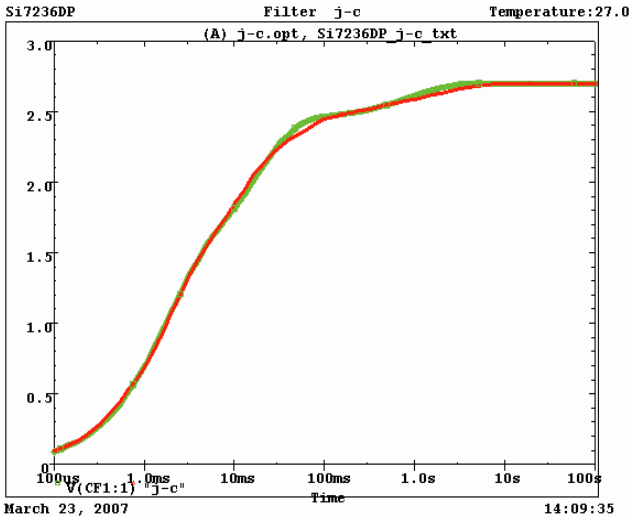
Time
March 23, 2007
12:45:18


Si7236DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7236DP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-c"
Time
March 23, 2007
14:09:35