R-C Thermal Model Parameters

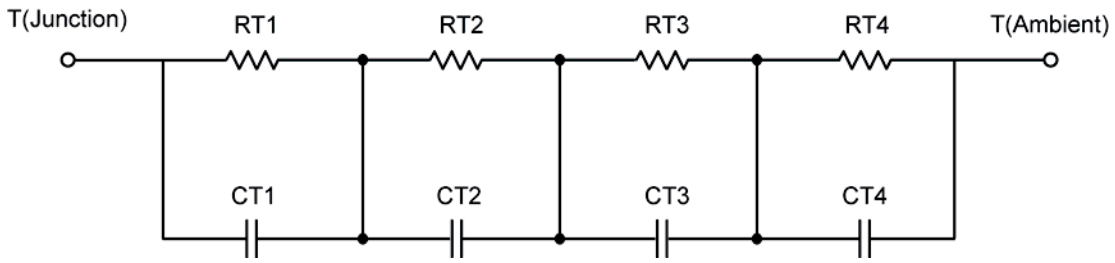
DESCRIPTION

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.

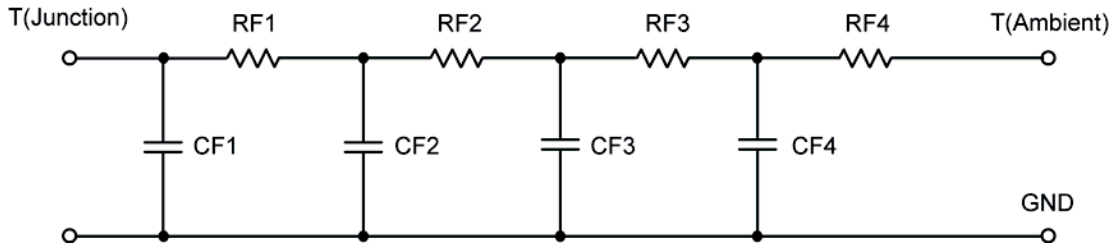
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.2083	73.5297 m	N/A
RT2	1.4903	481.0169 m	N/A
RT3	8.7622	442.7555 m	N/A
RT4	45.5392	502.6979 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	798.5995 m	95.9006 u	N/A
CT2	9.7434 m	32.1985 m	N/A
CT3	61.6872 m	10.4753 m	N/A
CT4	1.5612	35.3560 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

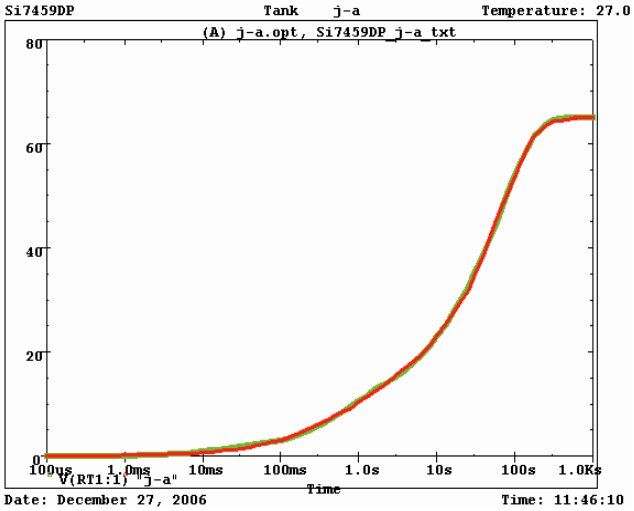


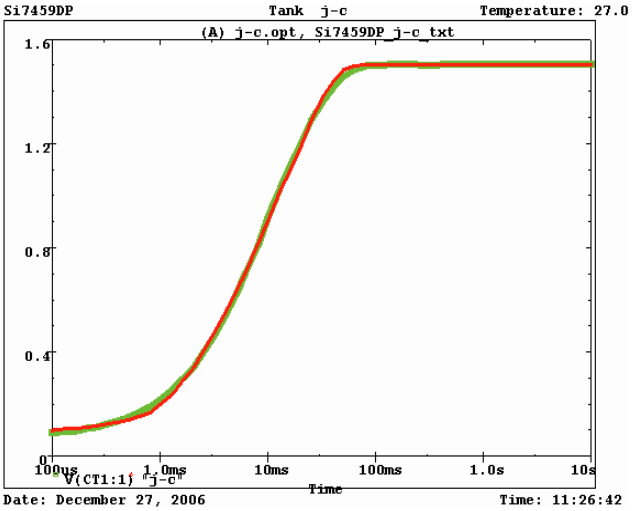
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.6273	70.5542 m	N/A
RF2	7.6686	644.8877 m	N/A
RF3	8.2492	259.7859 m	N/A
RF4	42.4549	524.7722 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	22.4225 m	439.8910 u	N/A
CF2	128.1298 m	5.0258 m	N/A
CF3	252.4112 m	10.1882 m	N/A
CF4	1.1389	67.4933 u	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


Si7459DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si7459DP_j-a_txt
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: December 27, 2006
Time: 11:46:10


Si7459DP
Tank j-c
Temperature: 27.0
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1.2
0.8
0.4
0
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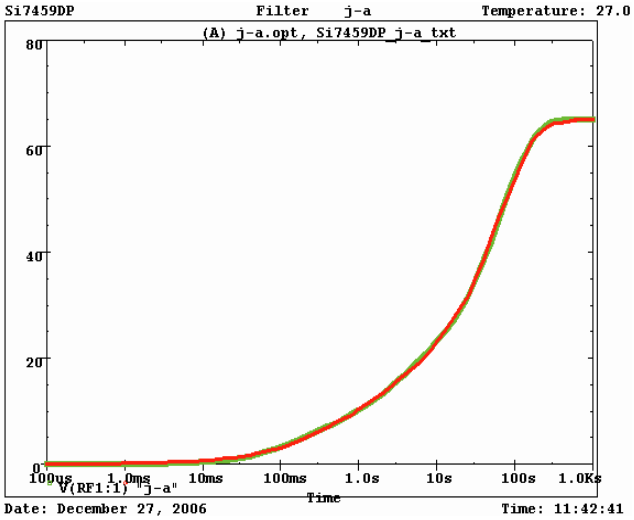
Time
Date: December 27, 2006
Time: 11:26:42


Si7459DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si7459DP_j-a_txt
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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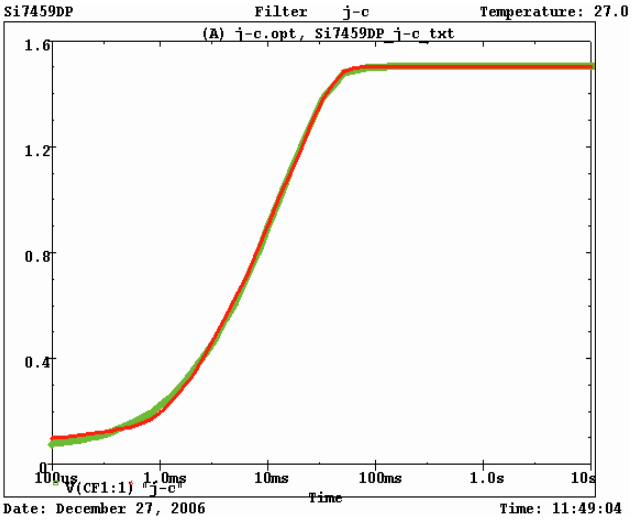
Time
Date: December 27, 2006
Time: 11:42:41


Si7459DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, Si7459DP_j-c_txt
1.6
1.2
0.8
0.4
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-c"
Time
Date: December 27, 2006
Time: 11:49:04