R-C Thermal Model Parameters

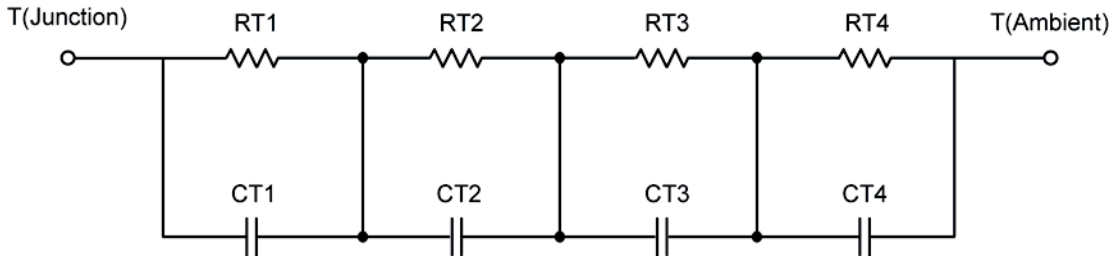
DESCRIPTION

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.

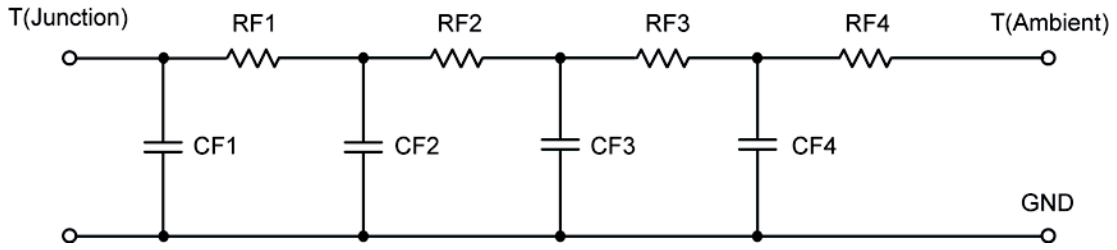
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	**Ambient Mosfet**	**Ambient Schottky**	**Case**	**Foot Mosfet**	**Foot Schottky**
RT1	7.7167	N/A	N/A	5.9041	N/A
RT2	27.6552	N/A	N/A	1.4509	N/A
RT3	19.3975	N/A	N/A	15.0319	N/A
RT4	55.2306	N/A	N/A	17.6131	N/A
Thermal Capacitance (Joules/°C)					
Junction to	**Ambient Mosfet**	**Ambient Schottky**	**Case**	**Foot Mosfet**	**Foot Schottky**
CT1	3.0594 m	N/A	N/A	6.3103 m	N/A
CT2	63.2655 m	N/A	N/A	1.3993 m	N/A
CT3	16.0790 m	N/A	N/A	12.8503 m	N/A
CT4	1.4444	N/A	N/A	74.1888 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

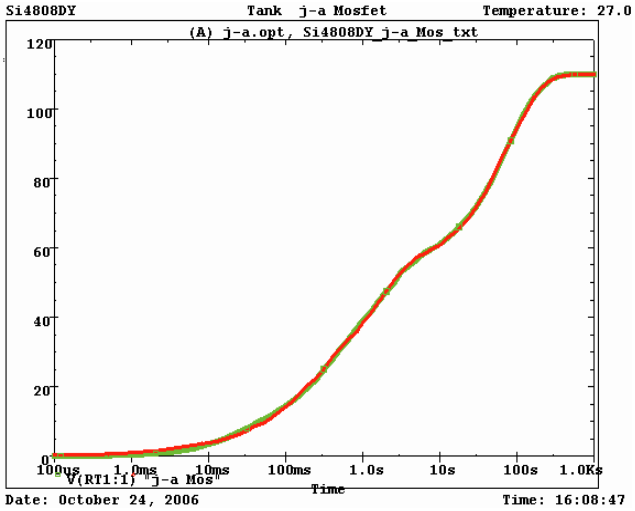


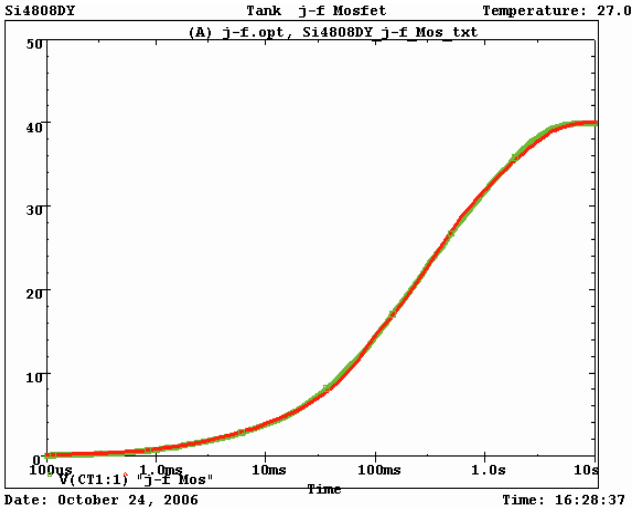
R-C VALUES FOR FILTER CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	**Ambient Mosfet**	**Ambient Schottky**	**Case**	**Foot Mosfet**	**Foot Schottky**
RF1	12.0643	N/A	N/A	2.9281	N/A
RF2	27.1714	N/A	N/A	17.4197	N/A
RF3	18.6585	N/A	N/A	12.5881	N/A
RF4	52.1058	N/A	N/A	7.0641	N/A
Thermal Capacitance (Joules/°C)					
Junction to	**Ambient Mosfet**	**Ambient Schottky**	**Case**	**Foot Mosfet**	**Foot Schottky**
CF1	2.5723 m	N/A	N/A	830.0558 u	N/A
CF2	12.3410 m	N/A	N/A	4.6348 m	N/A
CF3	83.4669 m	N/A	N/A	26.4066 m	N/A
CF4	1.4280	N/A	N/A	177.4079 m	N/A

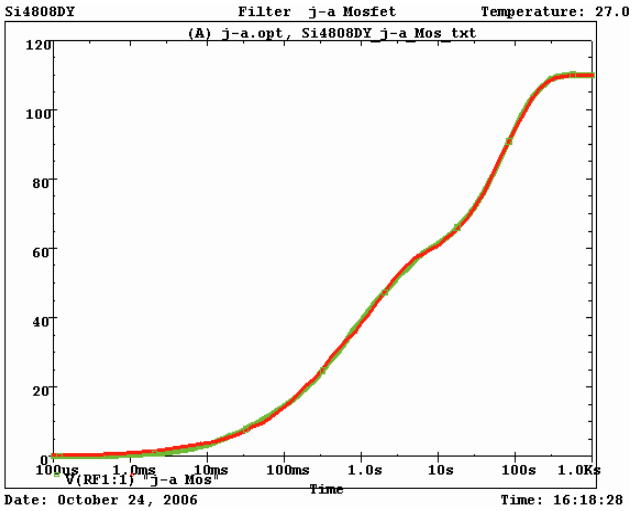
Note: NA indicates not applicable

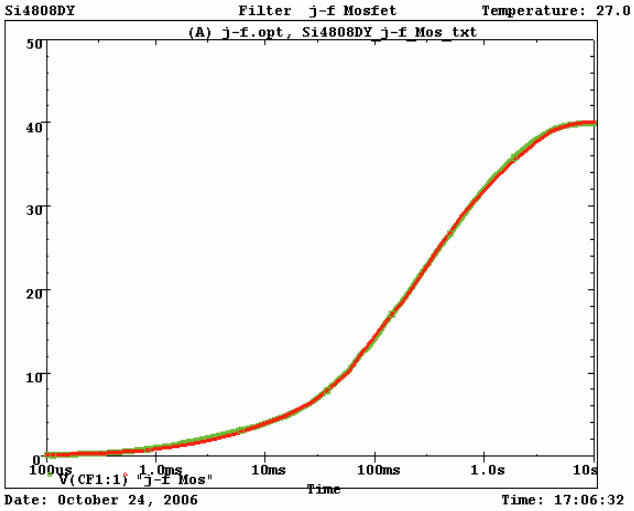
Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002


Si4808DY
Tank j-a Mosfet
Temperature: 27.0
(A) j-a.opt, Si4808DY_j-a_Mos_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a Mos"
Time
Date: October 24, 2006
Time: 16:08:47


Si4808DY
Tank j-f Mosfet
Temperature: 27.0
(A) j-f.opt, Si4808DY_j-f_Mos_txt
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-f Mos"
Time
Date: October 24, 2006
Time: 16:28:37


Si4808DY
Filter j-a Mosfet
Temperature: 27.0
(A) j-a.opt, Si4808DY_j-a_Mos_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a Mos"
Time
Date: October 24, 2006
Time: 16:18:28


Si4808DY
Filter j-f Mosfet
Temperature: 27.0
(A) j-f.opt, Si4808DY_j-f_Mos_txt
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f Mos"
Time
Date: October 24, 2006
Time: 17:06:32