R-C Thermal Model Parameters

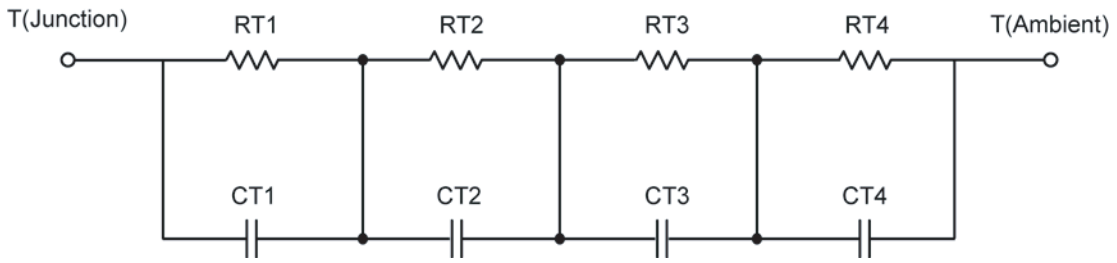
DESCRIPTION

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.

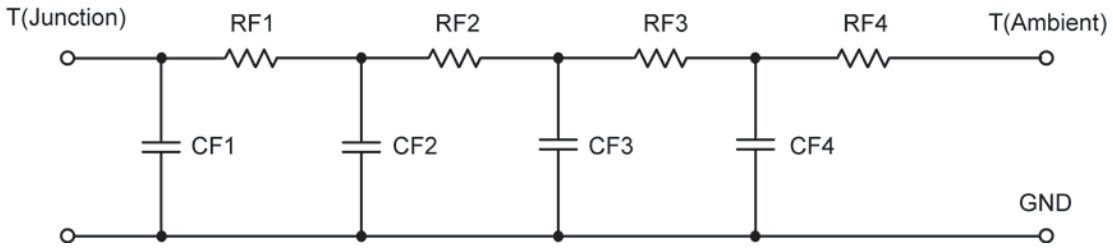
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient MOS**	**Ambient SCH**	**Foot**
RT1	28.4528	11.1617	N/A
RT2	22.4857	31.4775	N/A
RT3	6.5630	23.8736	N/A
RT4	32.4985	33.4872	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient MOS**	**Ambient SCH**	**Foot**
CT1	40.0298 m	433.0512 u	N/A
CT2	1.6857	96.9447 m	N/A
CT3	4.0731 m	6.9941 m	N/A
CT4	3.3716	1.8926	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

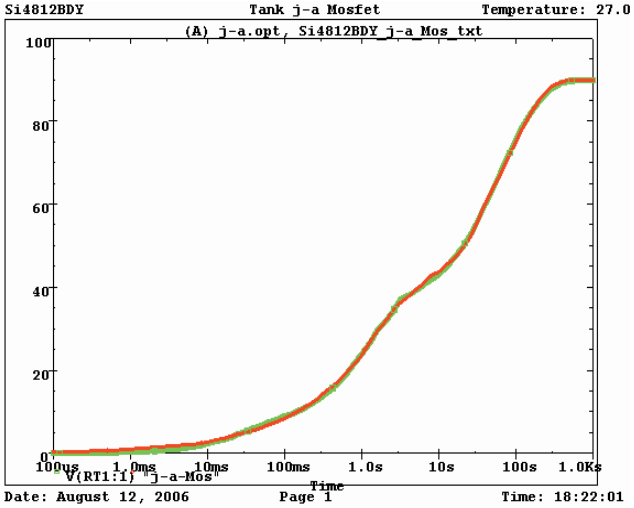


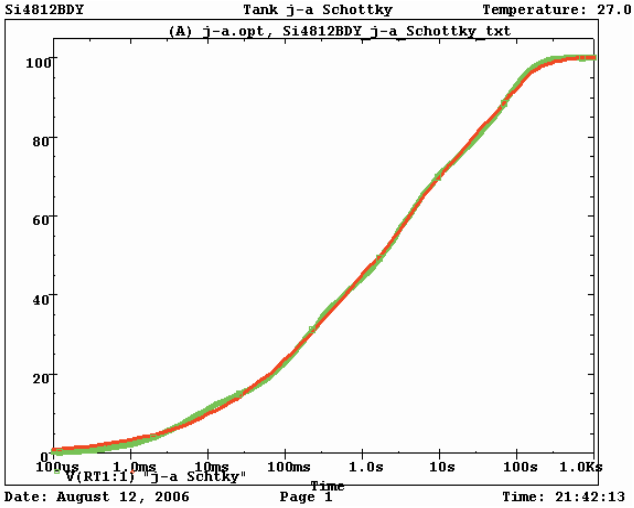
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient MOS**	**Ambient SCH**	**Foot**
RF1	5.6118	13.4984	N/A
RF2	17.7793	26.2516	N/A
RF3	17.2242	32.2508	N/A
RF4	49.3847	27.9992	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient MOS**	**Ambient SCH**	**Foot**
CF1	2.4126 m	475.3633 u	N/A
CF2	23.2033 m	6.8757 m	N/A
CF3	67.9932 m	107.5056 m	N/A
CF4	1.4999	2.3063	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


Si4812BDY
Tank j-a Mosfet
Temperature: 27.0
(A) j-a.opt, Si4812BDY_j-a_Mos_txt
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: August 12, 2006
Page 1
Time: 18:22:01


Si4812BDY
Tank j-a Schottky
Temperature: 27.0
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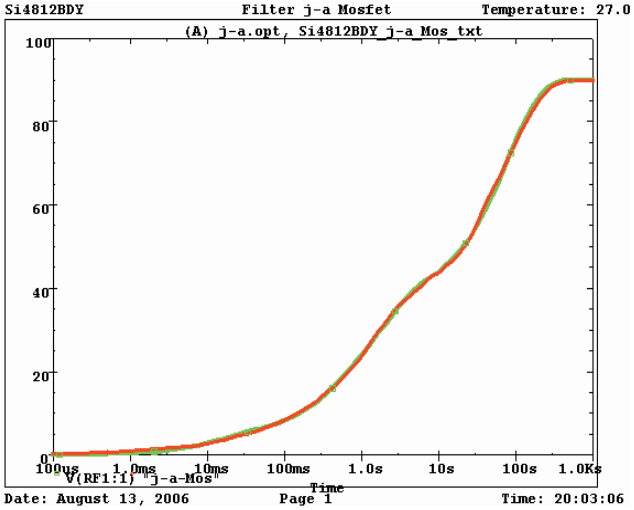
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a Schtky"
Time
Date: August 12, 2006
Page 1
Time: 21:42:13


Si4812BDY
Filter j-a Mosfet
Temperature: 27.0
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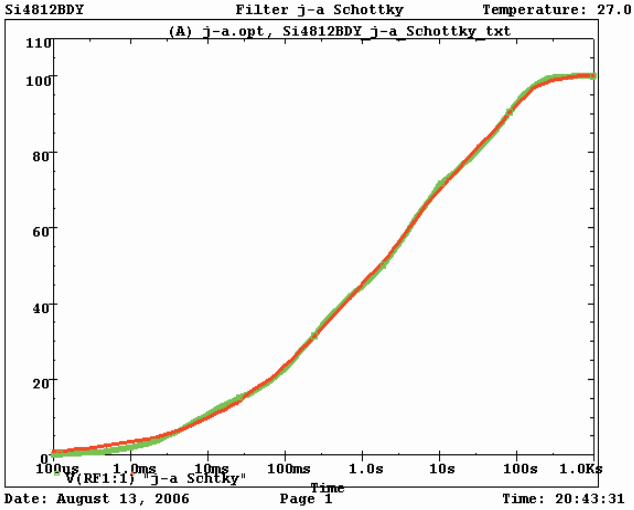
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a-Mos"
Time
Date: August 13, 2006
Page 1
Time: 20:03:06


Si4812BDY
Filter j-a Schottky
Temperature: 27.0
(A) j-a.opt, Si4812BDY_j-a_Schottky_txt
110
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a Schtky"
Time
Date: August 13, 2006
Page 1
Time: 20:43:31