R-C Thermal Model Parameters

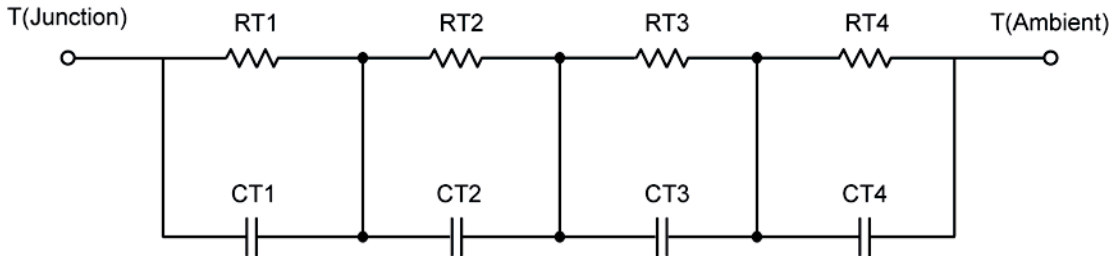
DESCRIPTION

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.

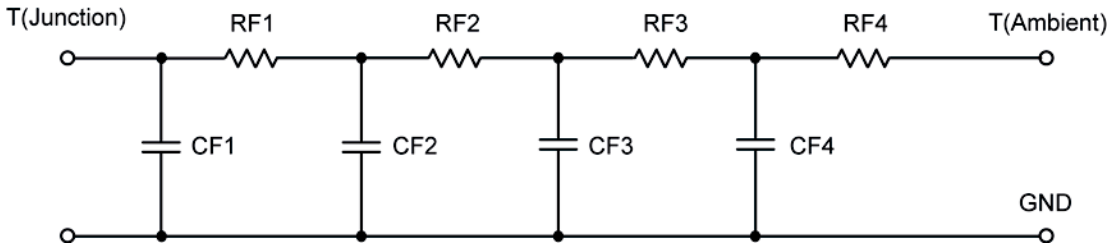
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.2255	N/A	4.7743
RT2	12.5770	N/A	3.7460
RT3	16.2415	N/A	7.5109
RT4	41.9562	N/A	5.9687
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	219.2622 m	N/A	26.8428 m
CT2	486.6010 u	N/A	231.3888 u
CT3	10.0294 m	N/A	2.1484 m
CT4	1.9025	N/A	1.9186 m

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

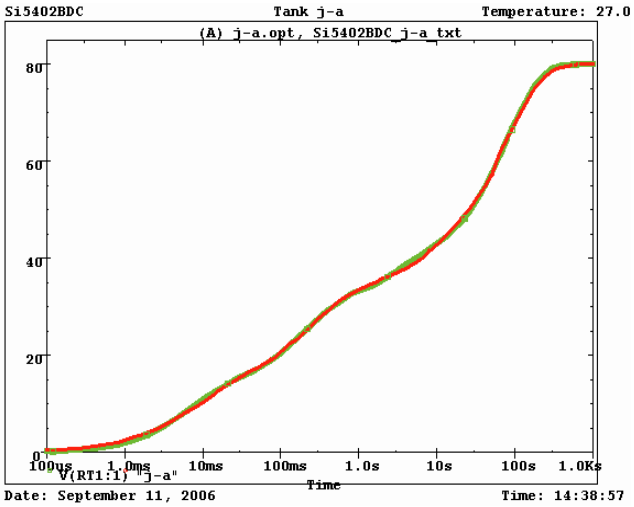


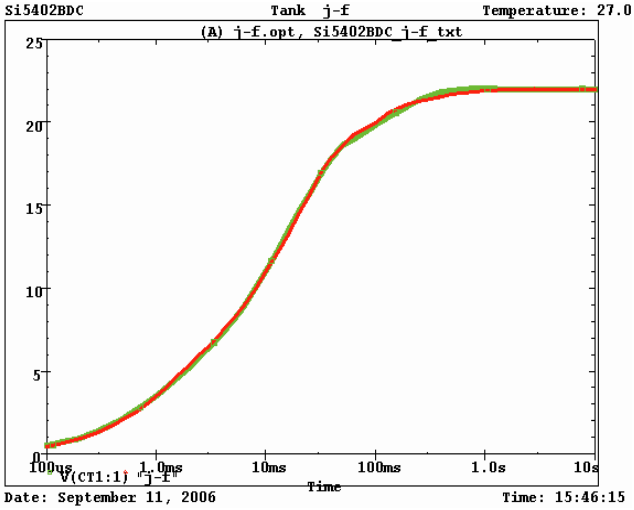
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.1958	N/A	7.5008
RF2	18.8676	N/A	9.4976
RF3	16.2142	N/A	3.8843
RF4	30.7225	N/A	1.1173
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	478.0101 u	N/A	230.0347 u
CF2	11.3892 m	N/A	1.1954 m
CF3	666.7729 m	N/A	7.4209 m
CF4	2.0625	N/A	329.4700 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


Si5402BDC
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si5402BDC_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: September 11, 2006
Time: 14:38:57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Tank j-f
Temperature: 27.0
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20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
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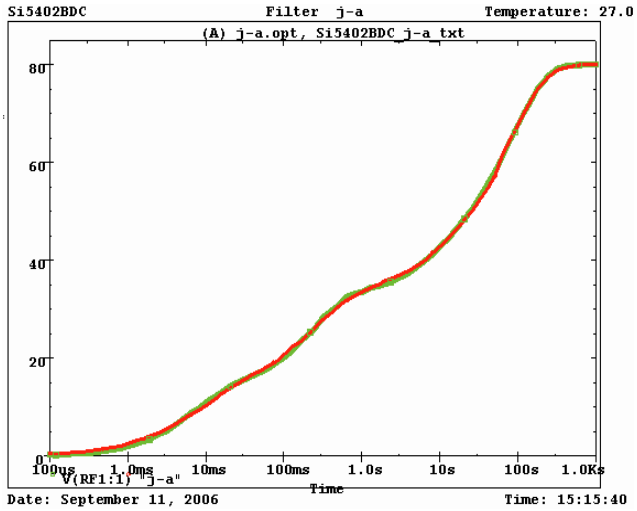
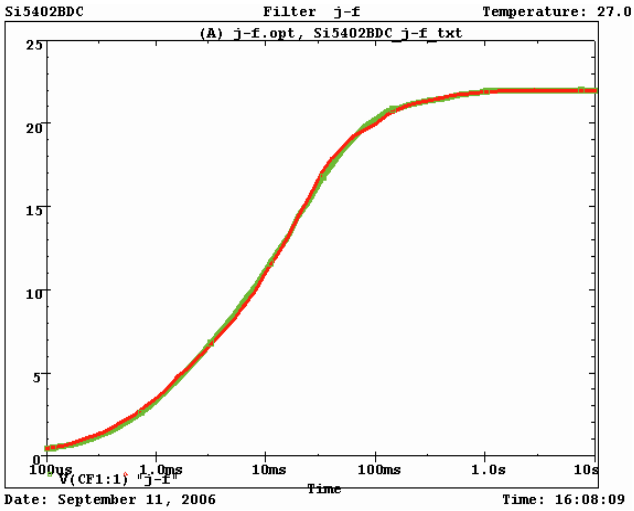
Time
Date: September 11, 2006
Time: 15:46:15


Si5402BDC
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si5402BDC_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: September 11, 2006
Time: 15:15:40


Si5402BDC
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si5402BDC_j-f_txt
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: September 11, 2006
Time: 16:08:09