R-C Thermal Model Parameters

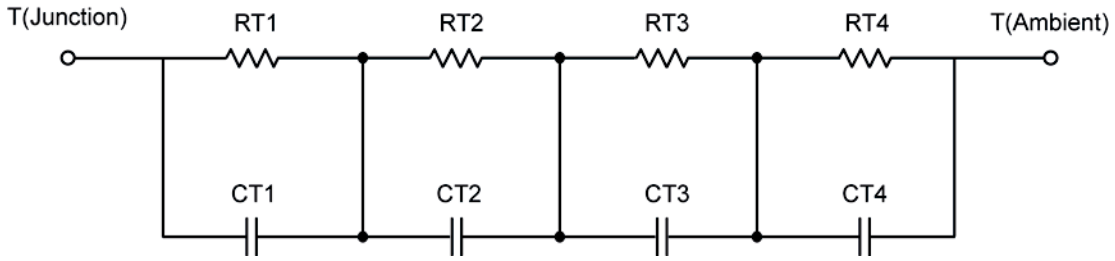
DESCRIPTION

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.

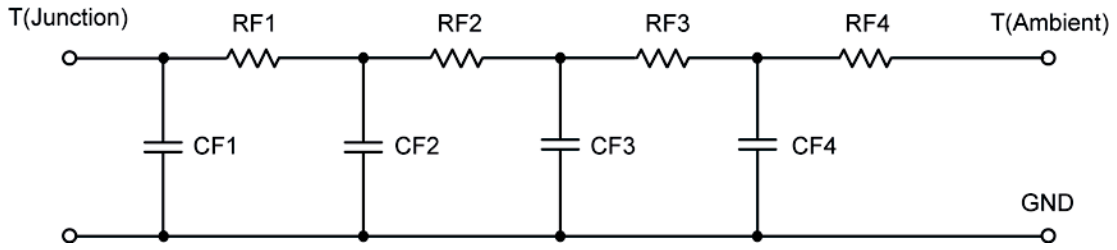
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.1299	N/A	3.8547
RT2	32.5344	N/A	26.5144
RT3	25.1850	N/A	17.6050
RT4	54.1507	N/A	8.0259
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	4.6246 m	N/A	4.8650 m
CT2	43.0454 m	N/A	25.9783 m
CT3	31.0009 m	N/A	108.9077 m
CT4	1.6502	N/A	16.9808 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

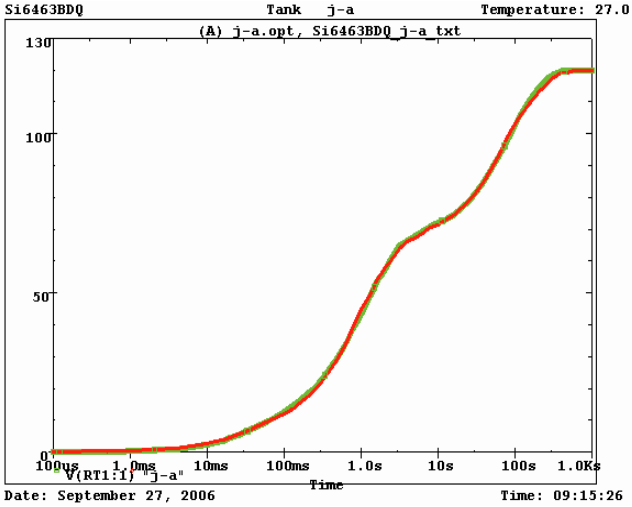


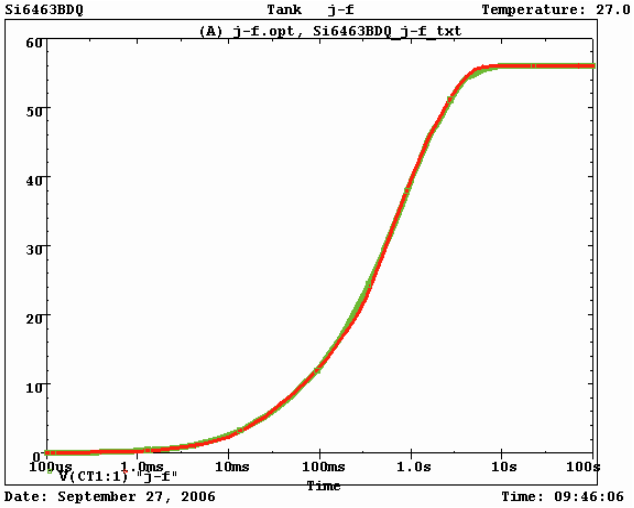
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.9573	N/A	4.3113
RF2	30.3009	N/A	15.1162
RF3	28.6967	N/A	22.5419
RF4	52.0451	N/A	14.0306
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.0917 m	N/A	2.2216 m
CF2	11.1350 m	N/A	5.5913 m
CF3	17.9191 m	N/A	12.5639 m
CF4	1.7371	N/A	52.9238 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


Si6463BDQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6463BDQ_j-a_txt
130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: September 27, 2006
Time: 09:15:26


Si6463BDQ
Tank j-f
Temperature: 27.0
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60
50
40
30
20
10
0
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Time
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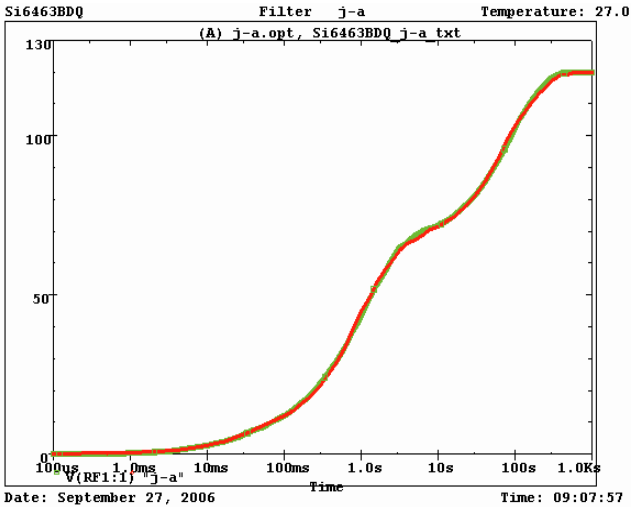
Time: 09:46:06


Si6463BDQ
Filter j-a
Temperature: 27.0
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130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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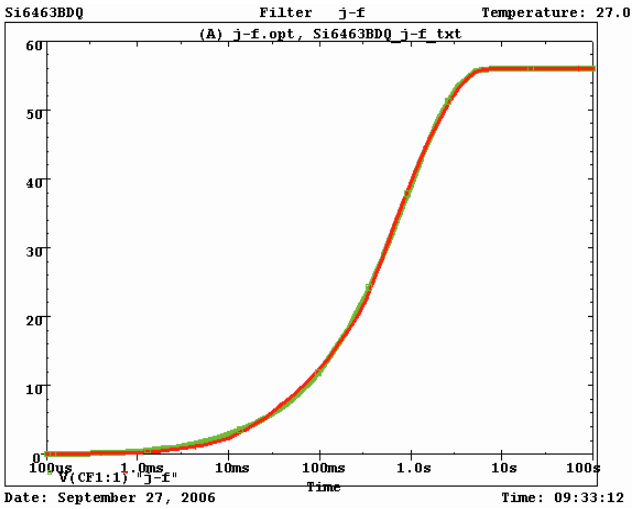
Time
Date: September 27, 2006
Time: 09:07:57


Si6463BDQ
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si6463BDQ_j-f_txt
60
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: September 27, 2006
Time: 09:33:12