R-C Thermal Model Parameters

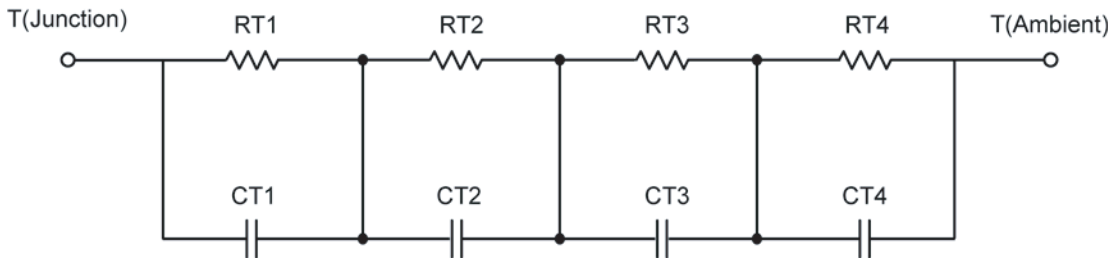
DESCRIPTION

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 configuration are included. The corresponding values for the Cauer/Filter configuration are available upon request.

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.

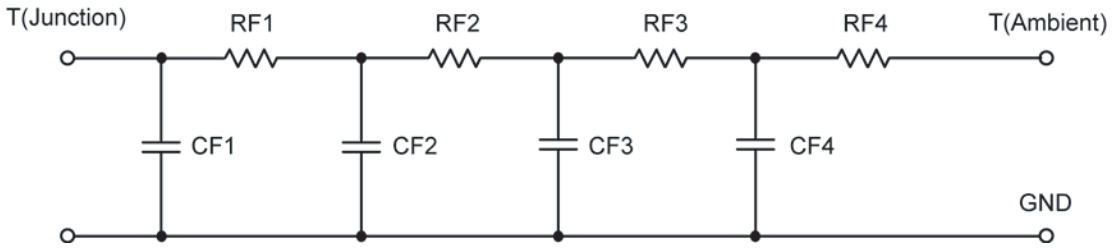
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.0692	N/A	8.6072
RT2	17.5132	N/A	1.1982
RT3	6.0839	N/A	3.2165
RT4	38.2266	N/A	6.9605
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	15.4756 m	N/A	2.9728 m
CT2	1.3203 m	N/A	736.7198 u
CT3	560.7579 m	N/A	13.6910 m
CT4	1.5684	N/A	3.4065 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

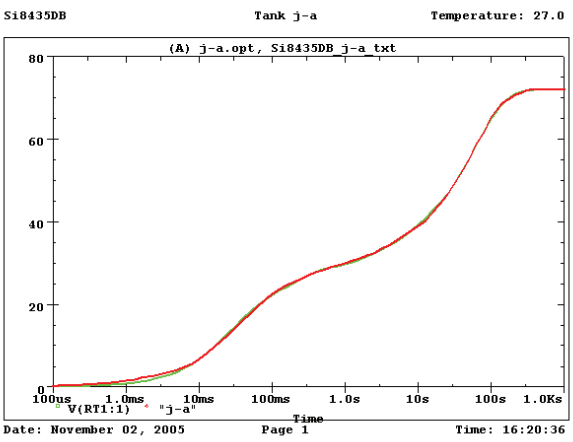


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.7970	N/A	2.5867
RF2	12.3272	N/A	7.6648
RF3	10.4765	N/A	7.3328
RF4	33.3286	N/A	2.4236
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0253 m	N/A	482.4989 u
CF2	6.7963 m	N/A	958.4250 u
CF3	433.1103 m	N/A	222.3754 u
CF4	1.3016	N/A	2.0874 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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Tank j-a
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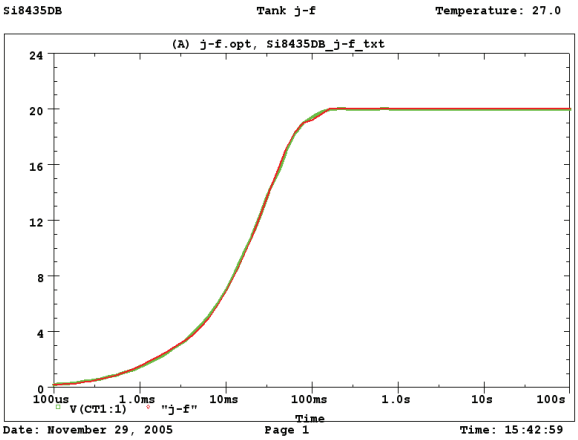
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: November 02, 2005
Page 1
Time: 16:20:36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10s
100s
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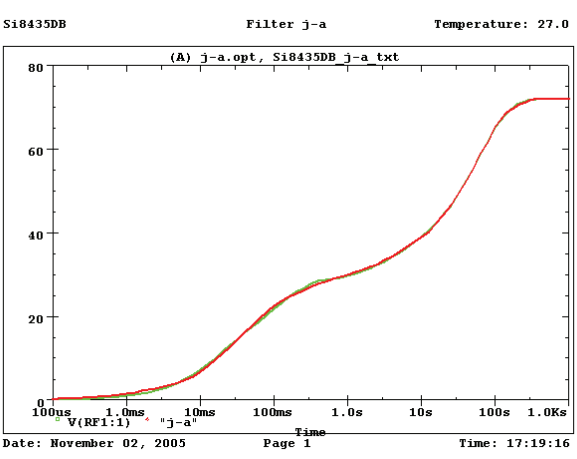
Page 1
Time: 15:42:59


Si8435DB
Filter j-a
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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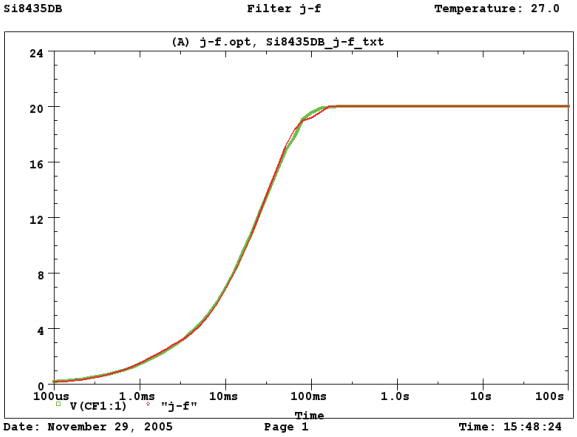
Time
Date: November 02, 2005
Page 1
Time: 17:19:16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Filter j-f
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20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: November 29, 2005
Page 1
Time: 15:48:24