R-C Thermal Model Parameters

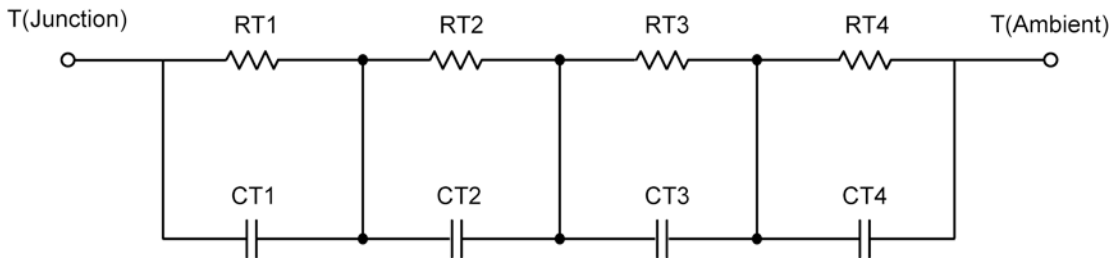
DESCRIPTION

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.

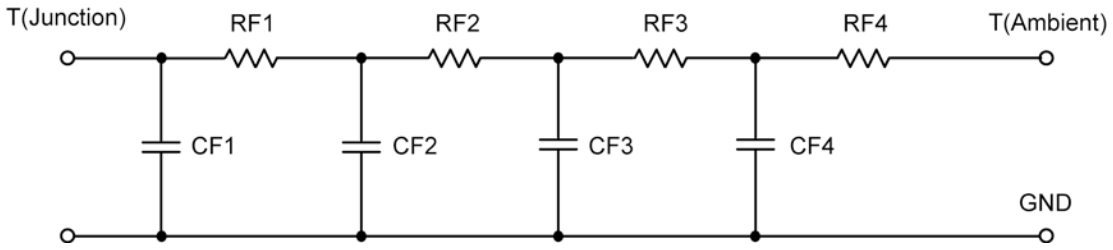
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.6277	N/A	1.5684
RT2	12.8596	N/A	14.1563
RT3	6.8283	N/A	869.8000 m
RT4	37.6844	N/A	3.4055
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	7.6334 m	N/A	807.5520 u
CT2	1.3086 m	N/A	1.9868 m
CT3	700.3419 m	N/A	201.1509 m
CT4	1.7891	N/A	8.3824 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

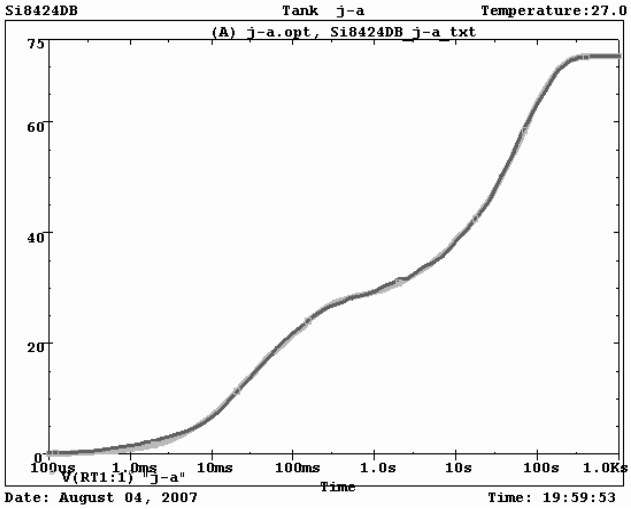


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.3241	N/A	3.7011
RF2	13.5958	N/A	13.3207
RF3	12.1859	N/A	2.5284
RF4	31.8942	N/A	449.8000 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	994.1650 u	N/A	558.4043 u
CF2	5.5673 m	N/A	1.1885 m
CF3	506.5453 m	N/A	960.0394 u
CF4	1.4782	N/A	549.3522 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
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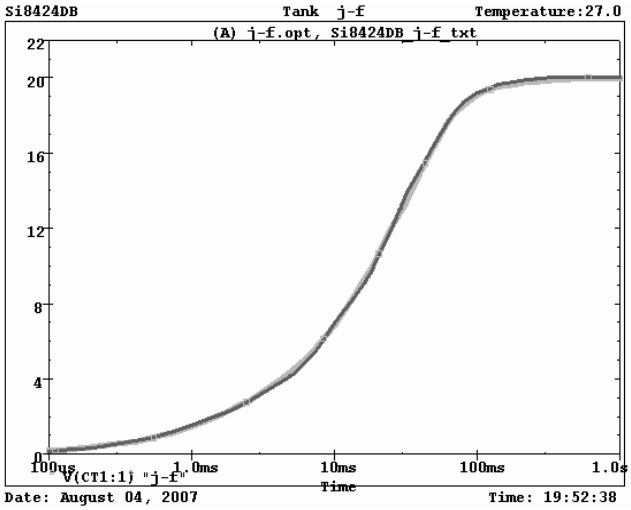
Time
Date: August 04, 2007
Time: 19:59:53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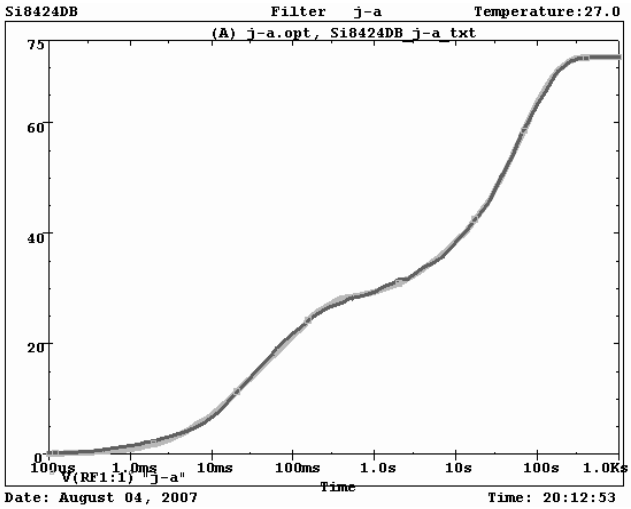
Si8424DB
Filter j-a
Temperature:27.0
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20
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100us
1.0ms
10ms
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10s
100s
1.0Ks
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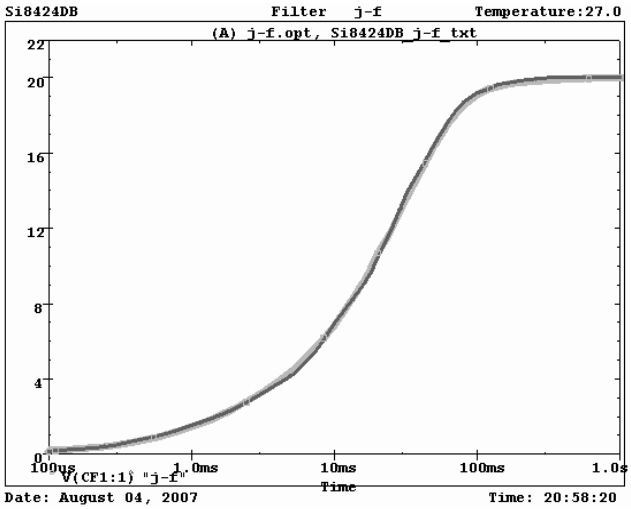
Time: 20:12:53


Si8424DB
Filter j-f
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20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
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Time
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Time: 20:58:20