R-C Thermal Model Parameters

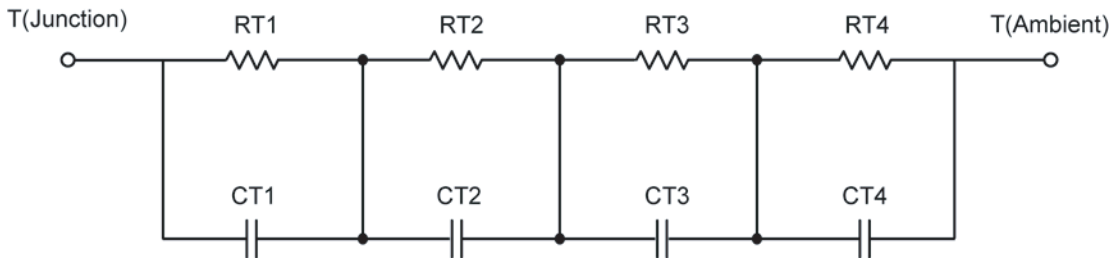
DESCRIPTION

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.

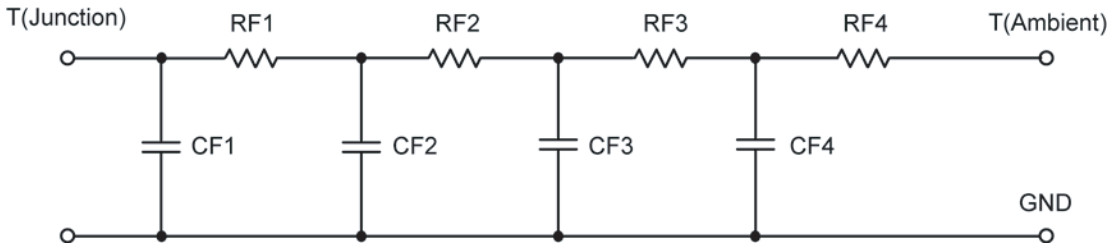
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.8996	N/A	17.2039
RT2	28.6466	N/A	18.4341
RT3	22.1757	N/A	2.5873
RT4	52.2781	N/A	3.7747
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	421.1611 u	N/A	7.8797 m
CT2	27.0118 m	N/A	54.2784 m
CT3	3.8516 m	N/A	1.3933
CT4	1.4335	N/A	1.8971 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

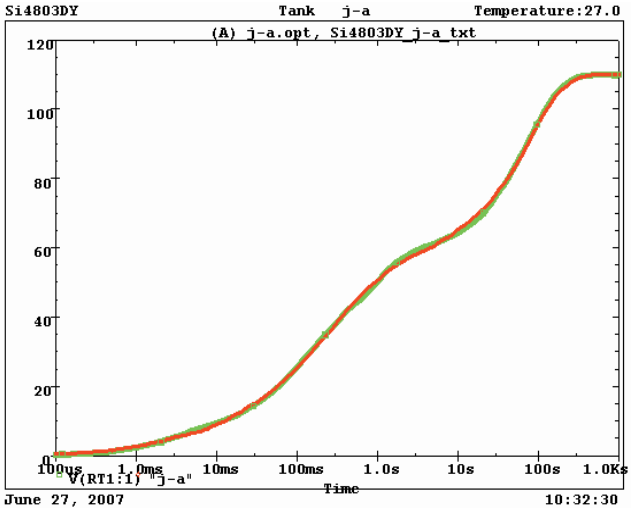


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	11.9908	N/A	5.1753
RF2	28.6596	N/A	17.1279
RF3	19.1148	N/A	16.9544
RF4	50.2348	N/A	2.7424
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	531.6831 u	N/A	1.4158 m
CF2	4.3284 m	N/A	4.9707 m
CF3	47.2016 m	N/A	32.8048 m
CF4	1.4617	N/A	1.0946

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


Si4803DY
Tank j-a
Temperature:27.0
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100
80
60
40
20
0
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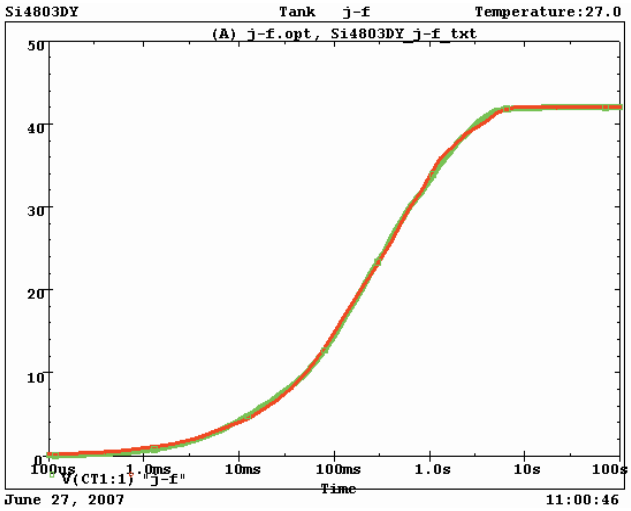
Time
June 27, 2007
10:32:30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Tank j-f
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40
30
20
10
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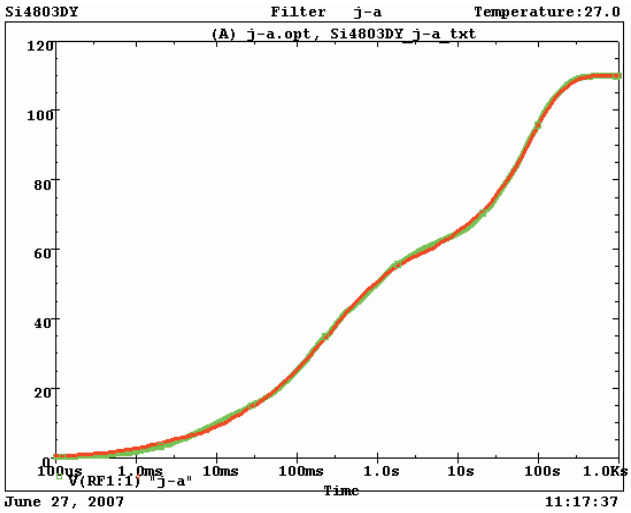
Si4803DY
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
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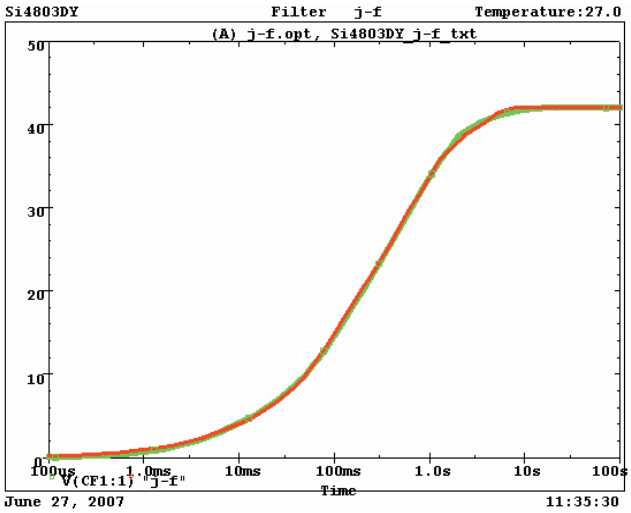
Si4803DY
Filter j-f
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40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
June 27, 2007
11:35:30