R-C Thermal Model Parameters

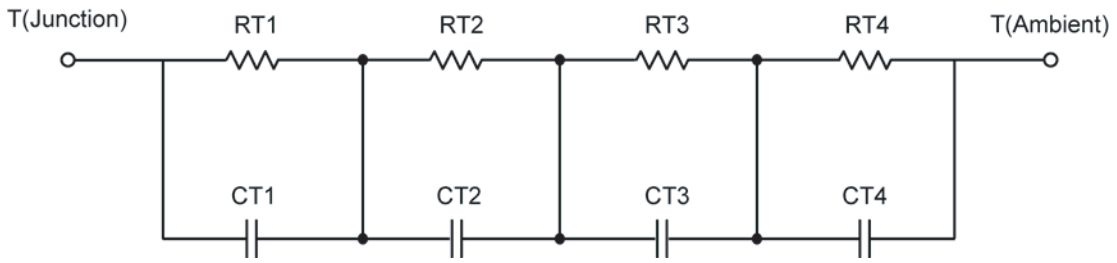
DESCRIPTION

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.

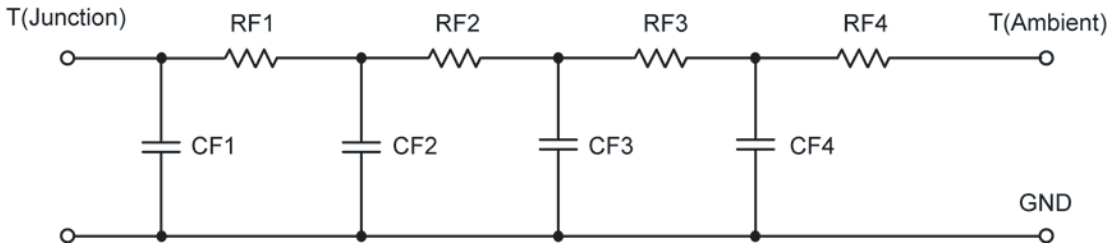
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.4416	N/A	18.8138
RT2	18.6004	N/A	3.6041
RT3	35.8250	N/A	4.1935
RT4	59.1597	N/A	18.4883
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	716.9061 u	N/A	3.4647 m
CT2	10.3032 m	N/A	184.3513 u
CT3	45.9017 m	N/A	734.8021 m
CT4	1.3185	N/A	41.5016 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

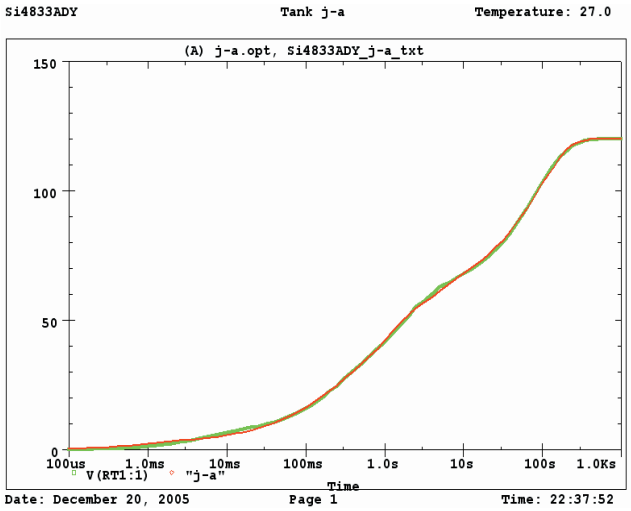


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.6669	N/A	5.9532
RF2	28.9384	N/A	20.2620
RF3	27.8091	N/A	7.5854
RF4	55.5893	N/A	11.2831
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	746.8655 u	N/A	303.2746 u
CF2	8.1962 m	N/A	4.0194 m
CF3	59.4462 m	N/A	24.7919 m
CF4	1.3572	N/A	70.7509 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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100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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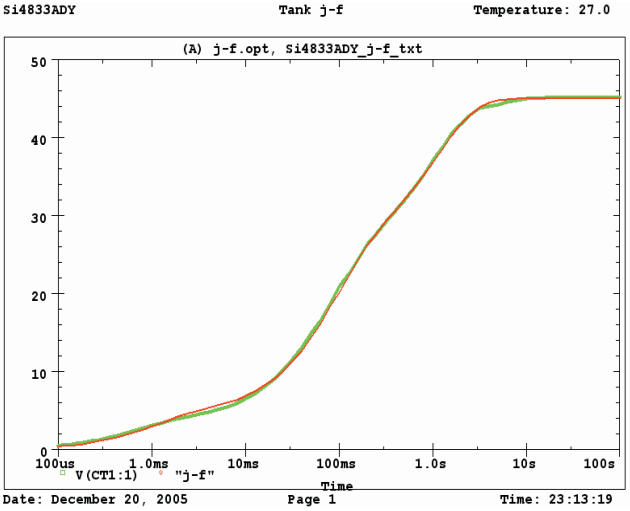
Time
Date: December 20, 2005
Page 1
Time: 22:37:52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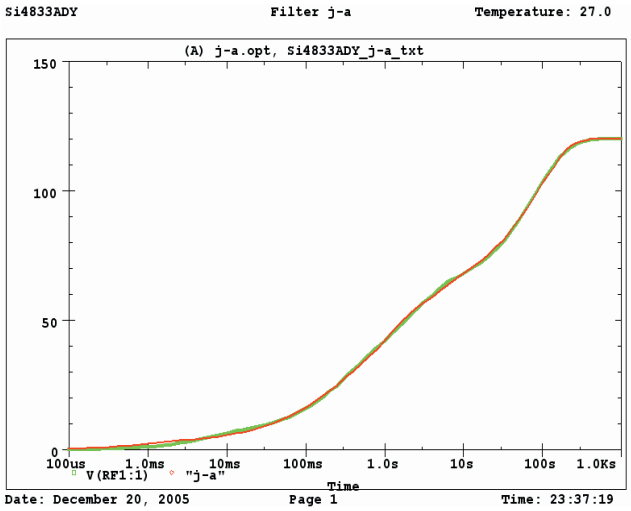
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Filter j-a
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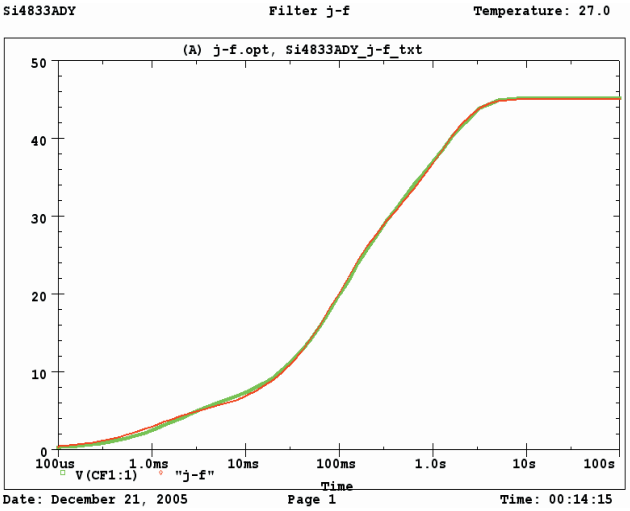
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: December 20, 2005
Page 1
Time: 23:37:19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Filter j-f
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30
20
10
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100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: December 21, 2005
Page 1
Time: 00:14:15