R-C Thermal Model Parameters

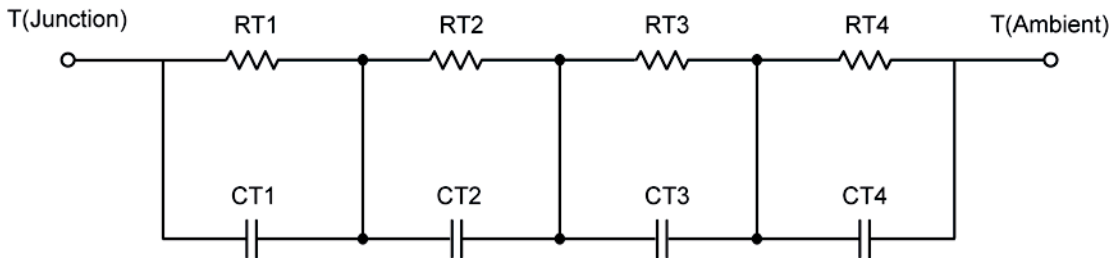
DESCRIPTION

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.

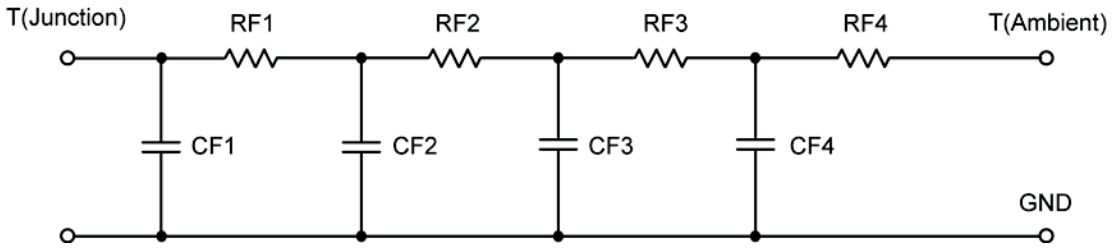
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.8558	N/A	7.1164
RT2	5.5330	N/A	686.8858 m
RT3	14.4998	N/A	4.0471
RT4	51.5942	N/A	9.1031
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	46.4471 m	N/A	9.8824 m
CT2	9.6323 m	N/A	1.0122 m
CT3	175.2058 m	N/A	1.4854
CT4	1.1057	N/A	103.5798 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

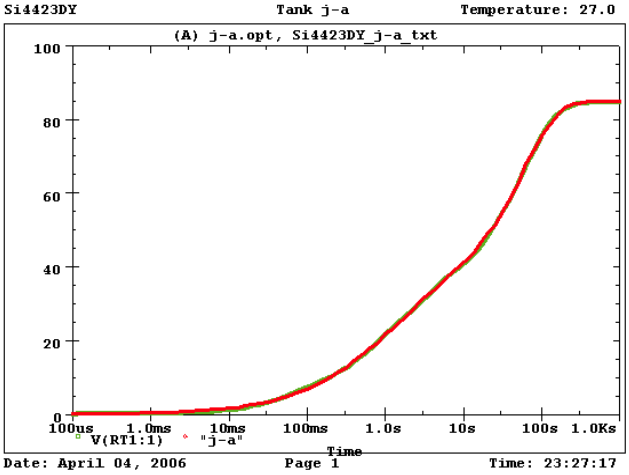


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.8571	N/A	1.4742
RF2	19.1774	N/A	9.0483
RF3	15.0203	N/A	8.2299
RF4	44.3669	N/A	2.0735
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	6.0118 m	N/A	1.9613 m
CF2	28.4945 m	N/A	9.7679 m
CF3	204.8711 m	N/A	143.6799 m
CF4	1.1248	N/A	1.9446

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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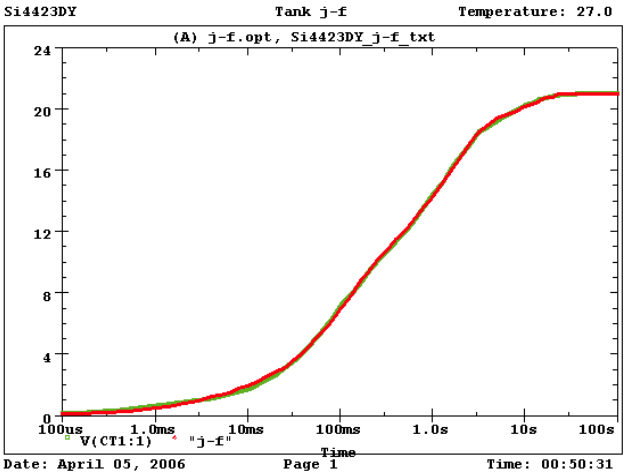
Page 1
Time: 23:27:17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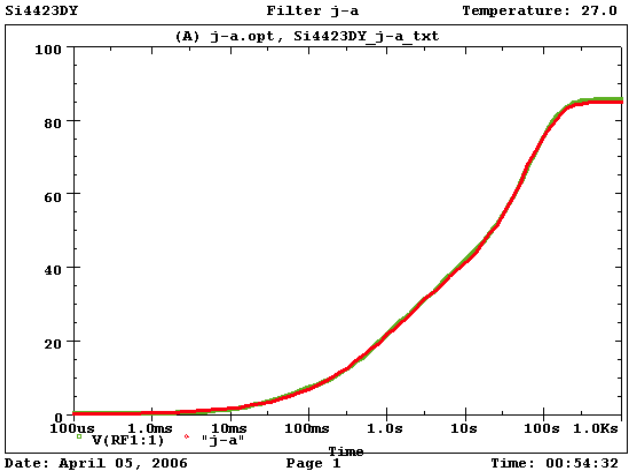
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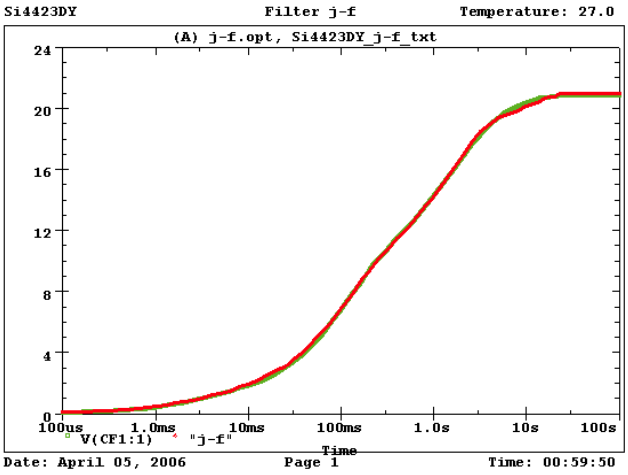
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Filter j-f
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20
16
12
8
4
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Page 1
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