R-C Thermal Model Parameters

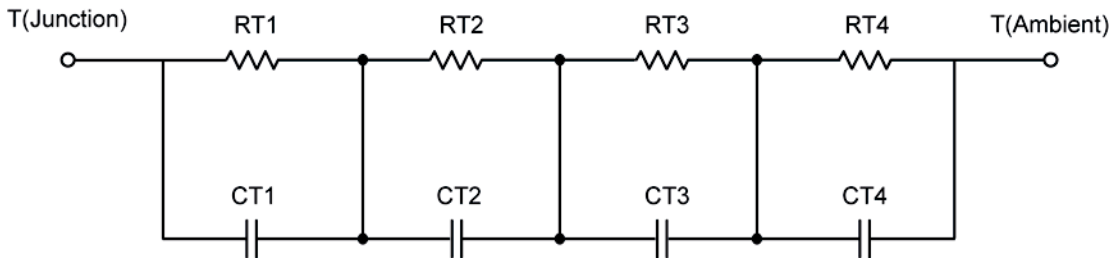
DESCRIPTION

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.

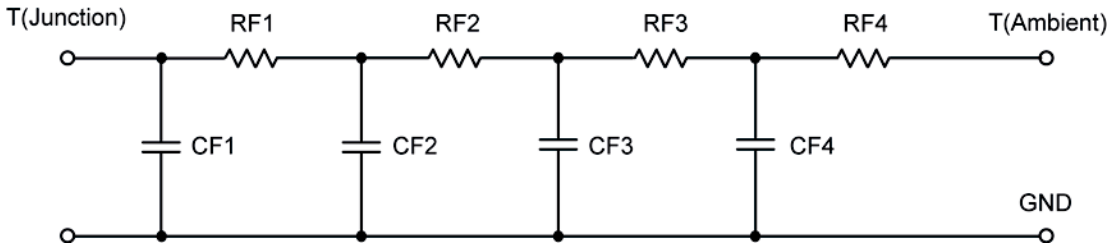
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	33.7046	N/A	16.9593
RT2	10.3815	N/A	5.9322
RT3	27.5960	N/A	7.3344
RT4	57.7521	N/A	17.6505
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3705 m	N/A	1.3690 m
CT2	271.4786 u	N/A	158.7504 u
CT3	36.5264 m	N/A	114.1553 m
CT4	1.2388	N/A	3.3780 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

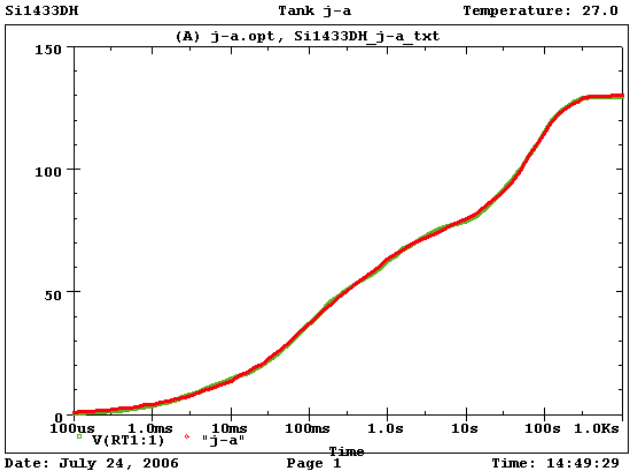


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.7647	N/A	9.5579
RF2	33.4653	N/A	22.3134
RF3	23.8334	N/A	9.0512
RF4	56.4769	N/A	6.9383
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	293.7906 u	N/A	150.0286 u
CF2	2.4376 m	N/A	982.4336 u
CF3	37.6498 m	N/A	1.4734 m
CF4	1.2316	N/A	104.6673 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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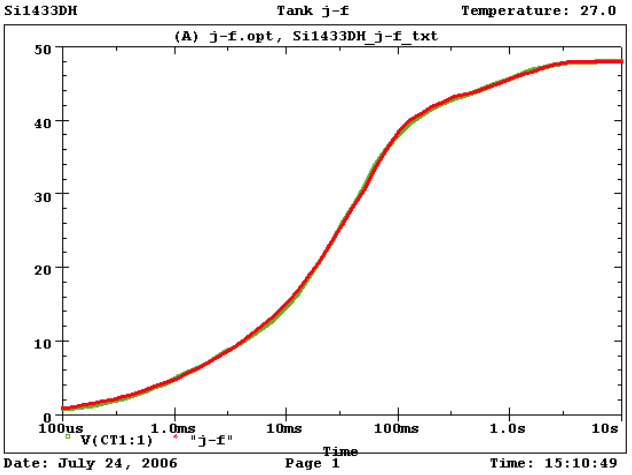
Time
Date: July 24, 2006
Page 1
Time: 14:49:29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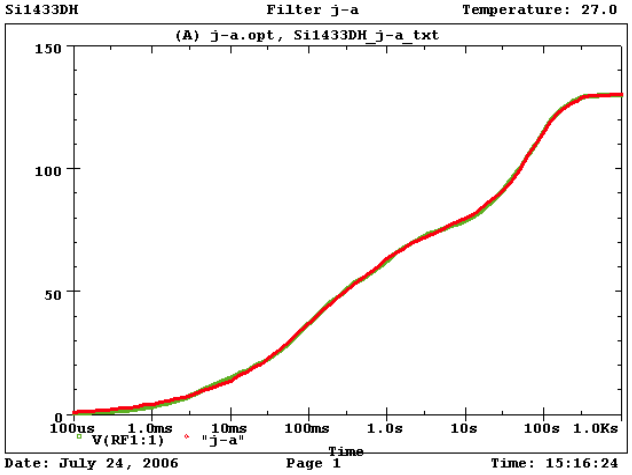
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100
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0
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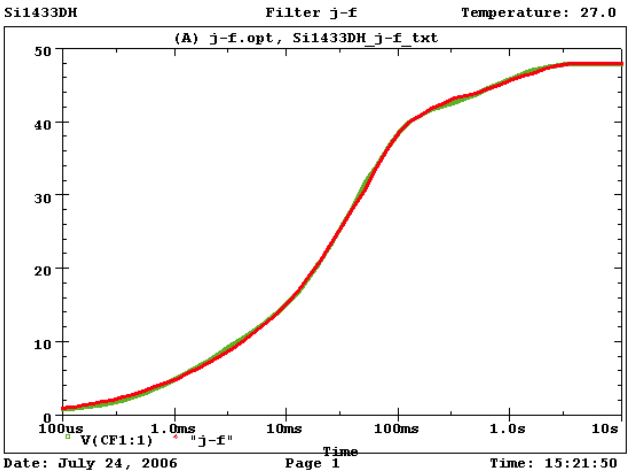
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Filter j-f
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40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
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Time
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Page 1
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