R-C Thermal Model Parameters

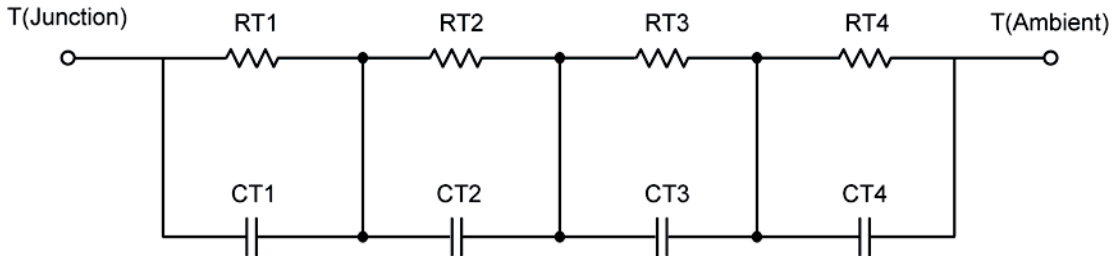
DESCRIPTION

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.

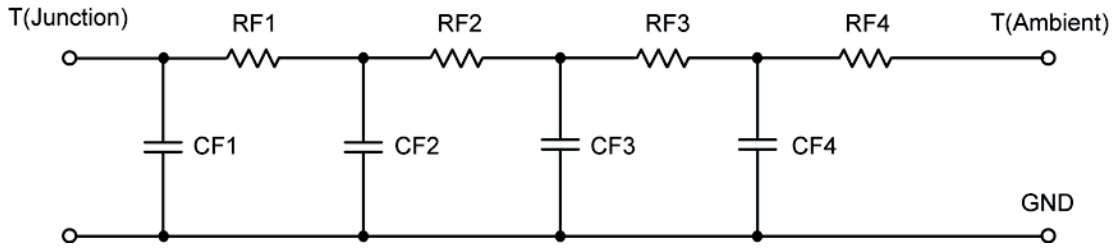
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.6804	N/A	6.4948
RT2	22.4830	N/A	19.9734
RT3	35.0832	N/A	11.0076
RT4	54.7534	N/A	7.5242
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	331.6698 u	N/A	146.2618 m
CT2	65.7997 m	N/A	1.7629 m
CT3	3.2601 m	N/A	6.0938 m
CT4	1.3907	N/A	204.0468 u

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

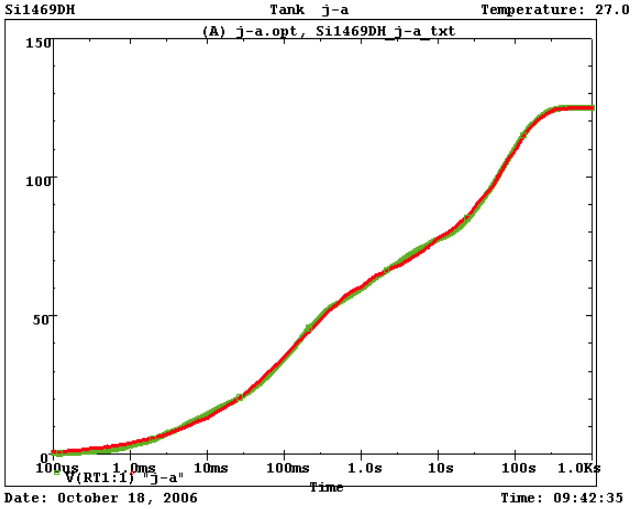


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	16.0369	N/A	8.8277
RF2	36.7018	N/A	29.5212
RF3	20.6292	N/A	2.1524
RF4	51.6321	N/A	4.4987
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	313.7956 u	N/A	154.9639 u
CF2	3.1498 m	N/A	1.2167 m
CF3	83.2244 m	N/A	122.3759 m
CF4	1.4111	N/A	657.6034 u

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


Si1469DH
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si1469DH_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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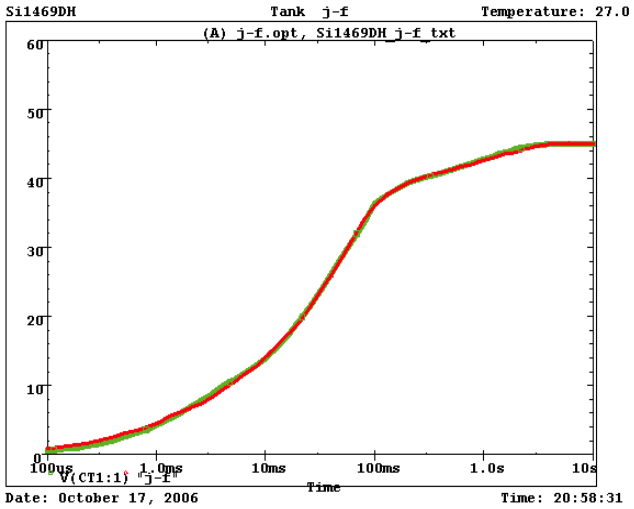
Time
Date: October 18, 2006
Time: 09:42:35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Tank j-f
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50
40
30
20
10
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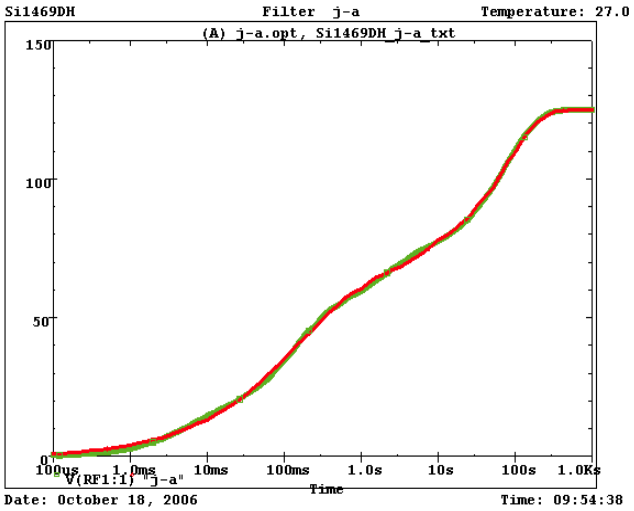
Si1469DH
Filter j-a
Temperature: 27.0
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100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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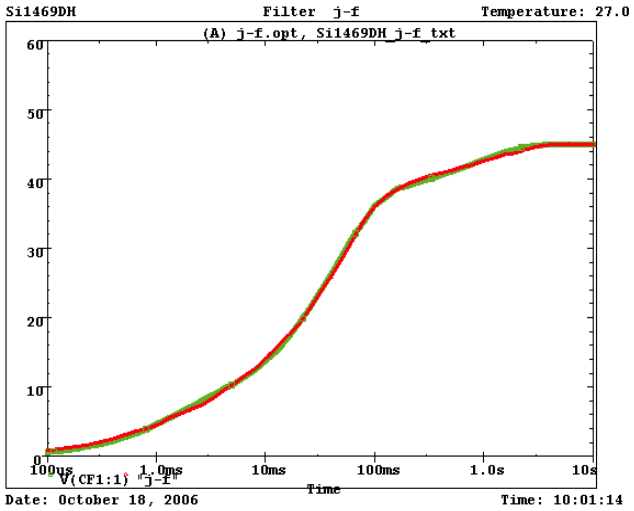
Date: October 18, 2006
Time: 09:54:38


Si1469DH
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si1469DH_j-f_txt
60
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: October 18, 2006
Time: 10:01:14