R-C Thermal Model Parameters

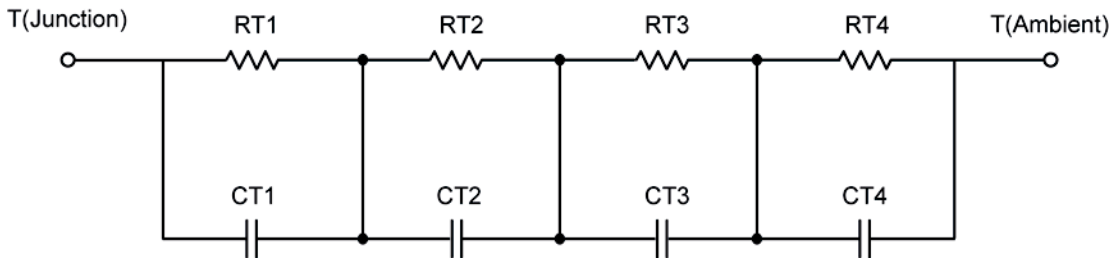
DESCRIPTION

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.

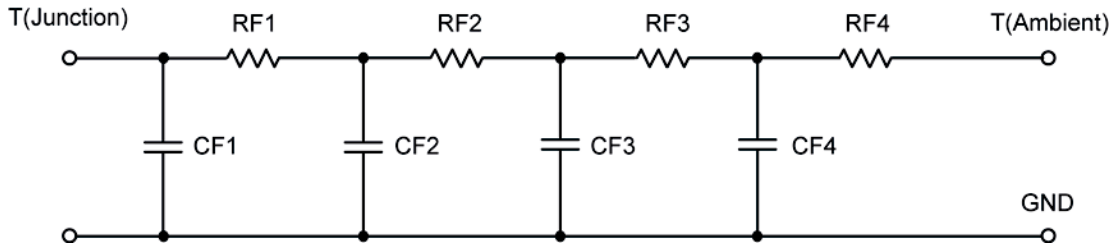
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.1726	N/A	6.5039
RT2	22.4447	N/A	19.9984
RT3	34.3423	N/A	10.9885
RT4	55.0404	N/A	7.5092
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	342.8128 u	N/A	150.1013 m
CT2	61.3646 m	N/A	1.7193 m
CT3	3.4091 m	N/A	6.1462 m
CT4	1.3732	N/A	196.8209 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

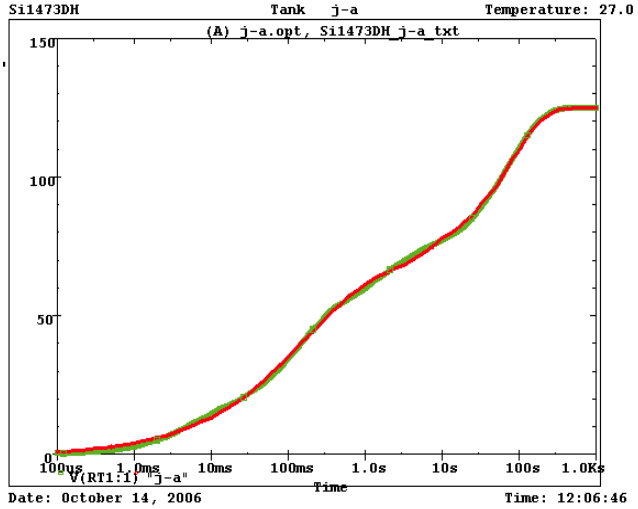


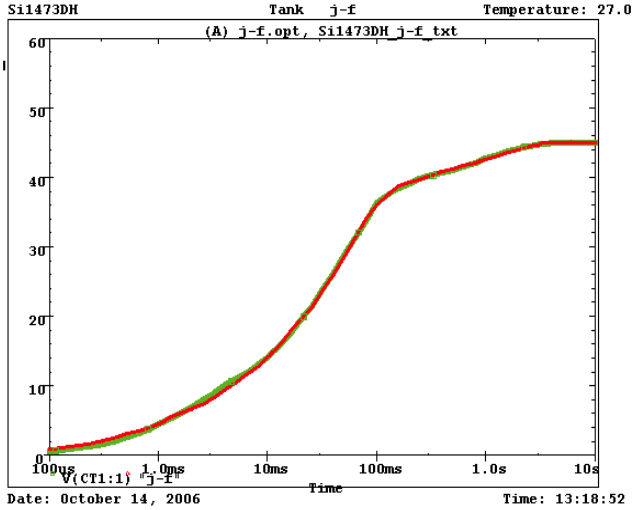
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	16.0347	N/A	8.7965
RF2	36.7512	N/A	29.5268
RF3	20.6145	N/A	2.1542
RF4	51.5996	N/A	4.5225
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	312.5484 u	N/A	154.7457 u
CF2	3.1565 m	N/A	1.2134 m
CF3	83.1170 m	N/A	120.3345 m
CF4	1.4144	N/A	665.7070 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


Si1473DH
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si1473DH_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: October 14, 2006
Time: 12:06:46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Tank j-f
Temperature: 27.0
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50
40
30
20
10
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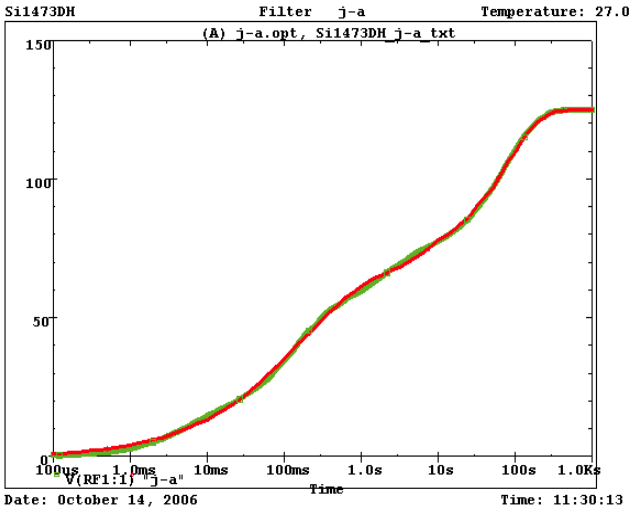
Si1473DH
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si1473DH_j-a_txt
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100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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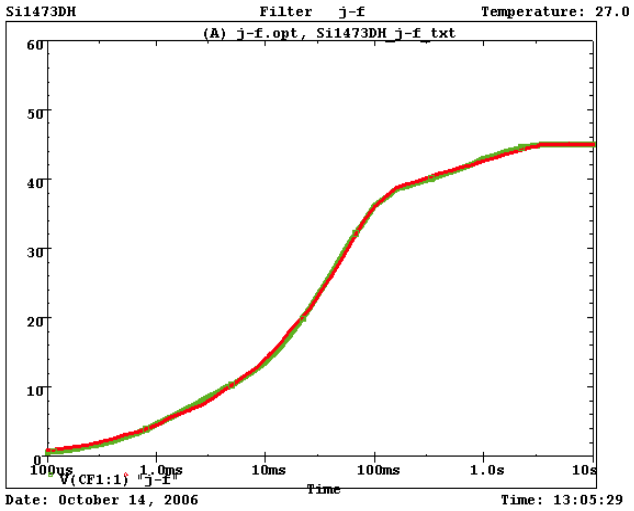
Time
Date: October 14, 2006
Time: 11:30:13


Si1473DH
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si1473DH_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 14, 2006
Time: 13:05:29