R-C Thermal Model Parameters

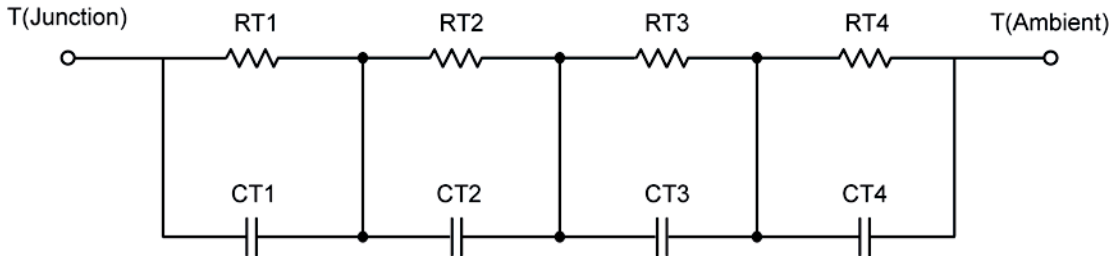
DESCRIPTION

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.

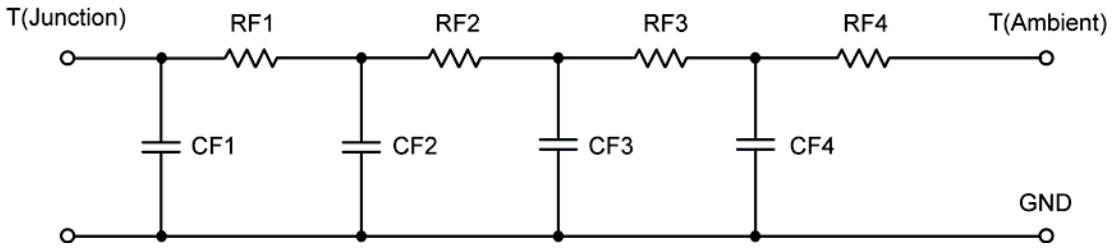
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.8093	N/A	22.8576
RT2	34.9647	N/A	6.8294
RT3	26.3902	N/A	6.2761
RT4	56.8358	N/A	9.0369
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	162.8778 u	N/A	1.4095 m
CT2	2.0906 m	N/A	171.5347 u
CT3	40.2409 m	N/A	262.5130 m
CT4	1.3951	N/A	11.4353 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

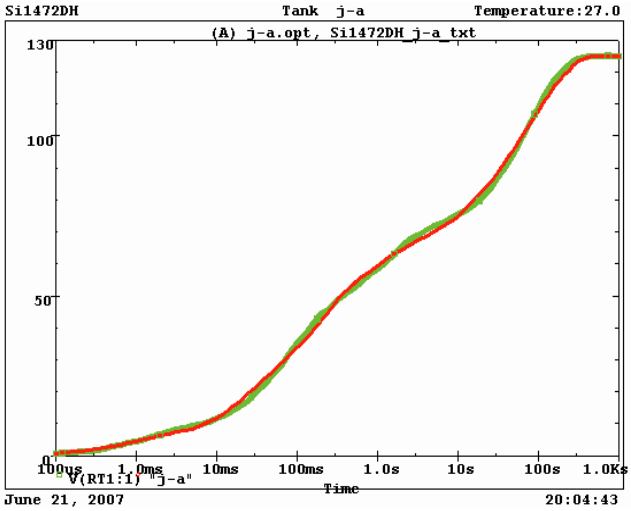


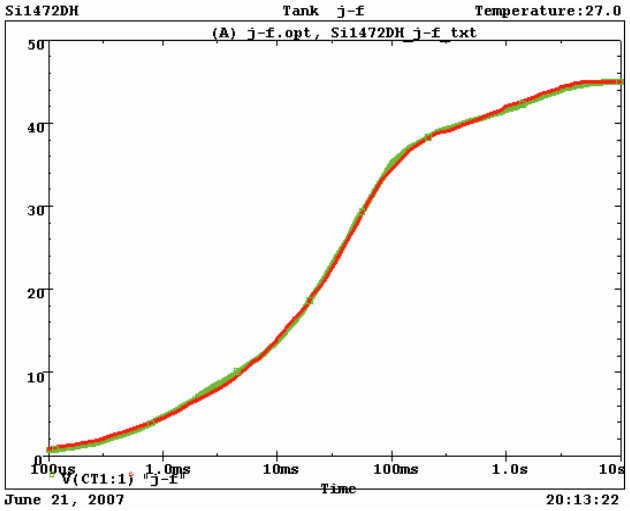
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.3063	N/A	5.3345
RF2	39.1718	N/A	5.7488
RF3	22.7273	N/A	26.8876
RF4	53.7946	N/A	7.0291
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	180.1369 u	N/A	110.7145 u
CF2	2.1877 m	N/A	352.3051 u
CF3	60.8164 m	N/A	1.0915 m
CF4	1.4512	N/A	168.0905 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


Si1472DH
Tank j-a
Temperature:27.0
(A) j-a.opt, Si1472DH_j-a_txt
130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
June 21, 2007
20:04:43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Tank j-f
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40
30
20
10
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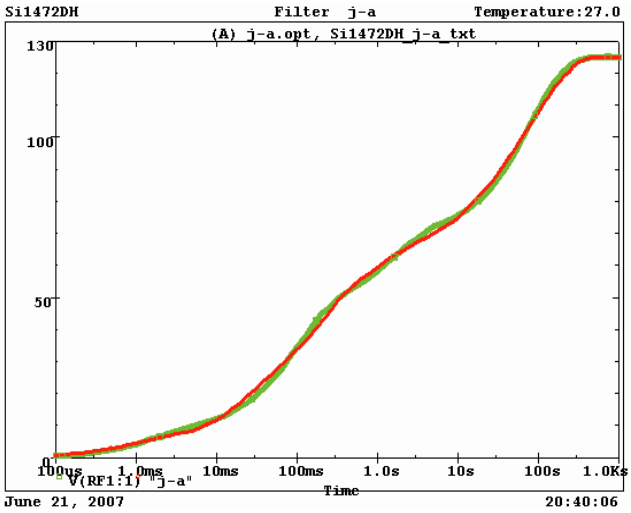
20:13:22


Si1472DH
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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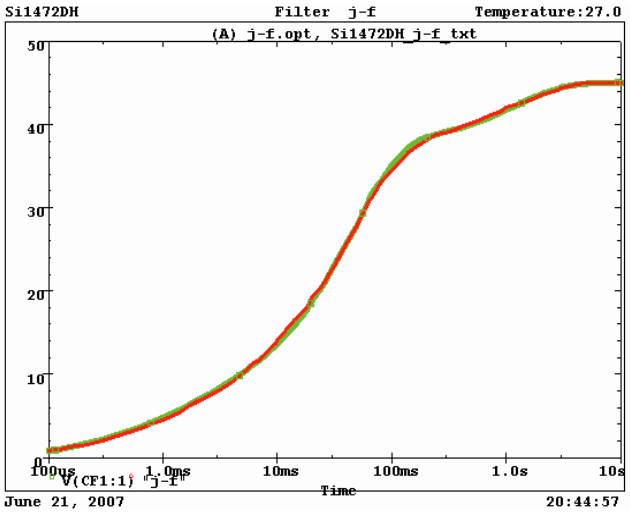
20:40:06


Si1472DH
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
June 21, 2007
20:44:57