R-C Thermal Model Parameters

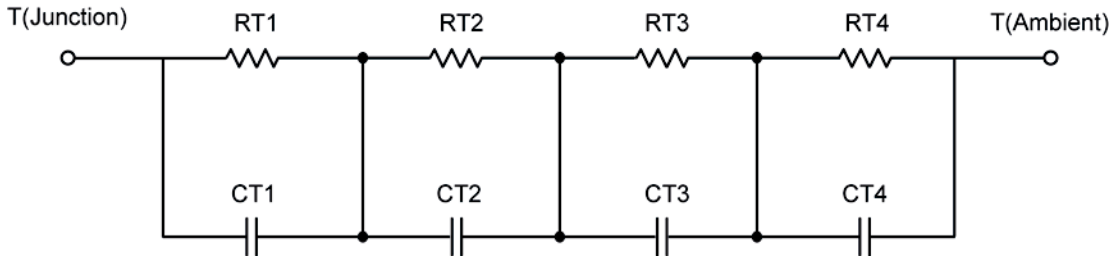
DESCRIPTION

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.

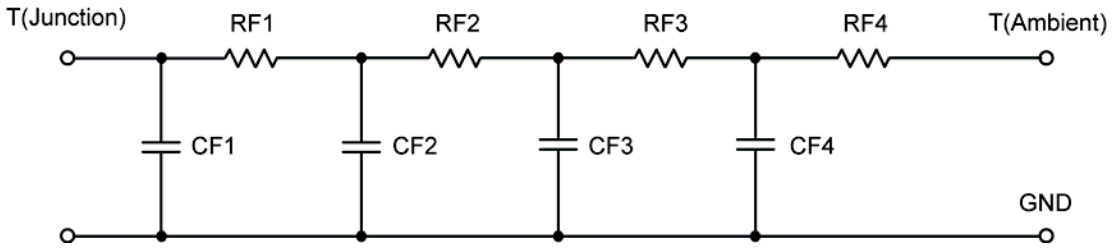
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	32.0215	N/A	16.0816
RT2	9.0988	N/A	5.6874
RT3	25.8035	N/A	6.6903
RT4	57.7384	N/A	16.3317
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.2839 m	N/A	1.3275 m
CT2	274.8858u	N/A	152.2096 u
CT3	46.0105 m	N/A	282.6702 m
CT4	1.5832	N/A	4.5054 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

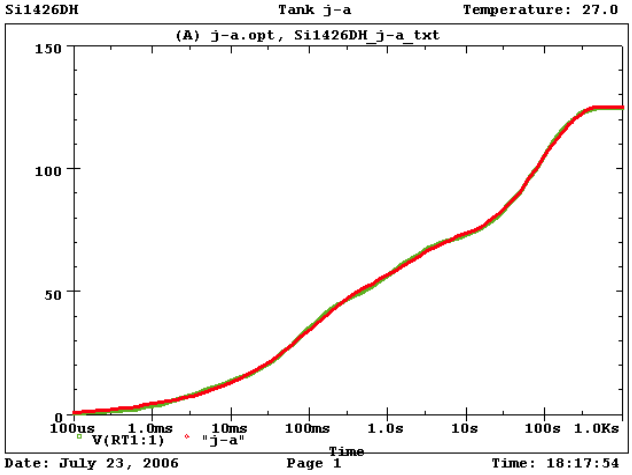


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.3294	N/A	9.2368
RF2	31.7197	N/A	21.5563
RF3	22.1557	N/A	8.3478
RF4	55.6908	N/A	5.7557
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	327.3246 u	N/A	167.0091 u
CF2	2.7912 m	N/A	1.2303 m
CF3	62.8819 m	N/A	2.9671 m
CF4	1.6134	N/A	383.5363 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
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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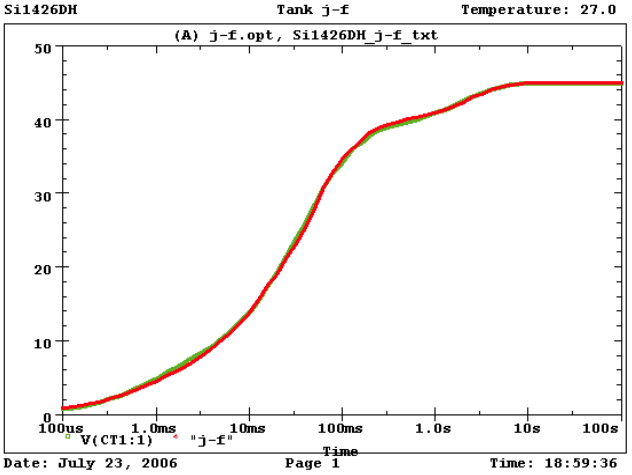
Time
Date: July 23, 2006
Page 1
Time: 18:17:54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30
20
10
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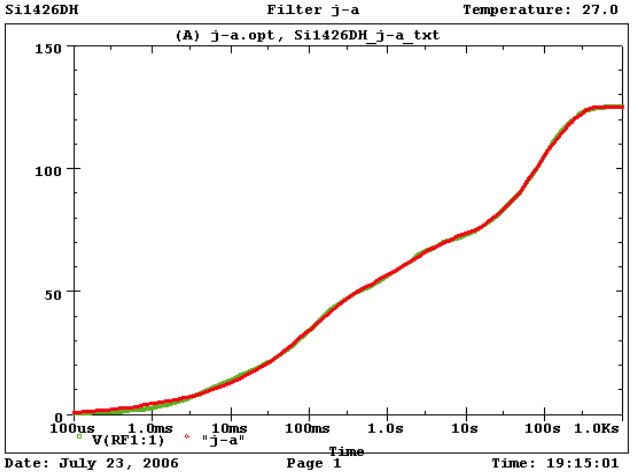
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Filter j-a
Temperature: 27.0
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100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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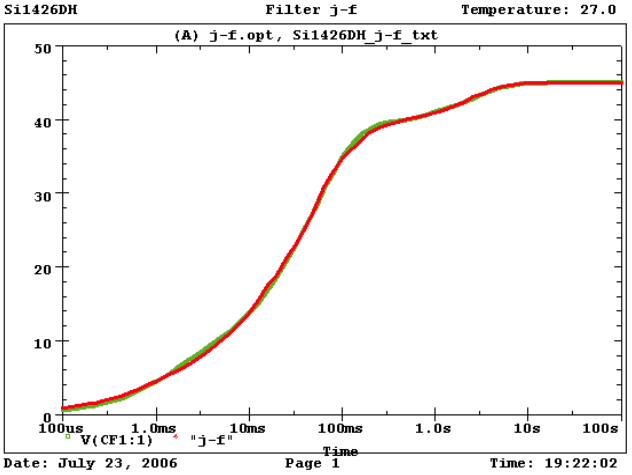
Si1426DH
Filter j-f
Temperature: 27.0
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50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: July 23, 2006
Page 1
Time: 19:22:02