R-C Thermal Model Parameters

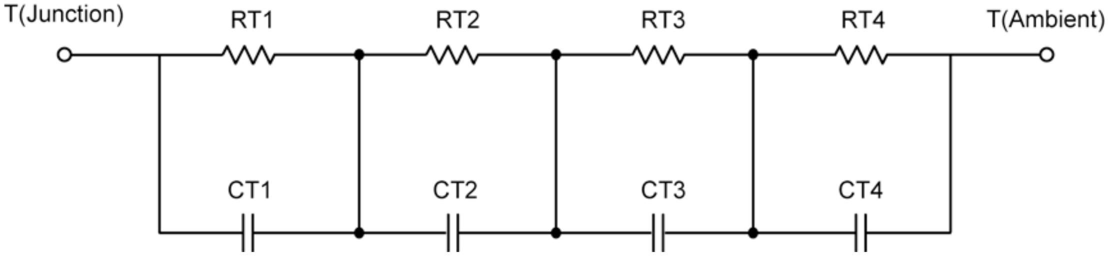
DESCRIPTION

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.

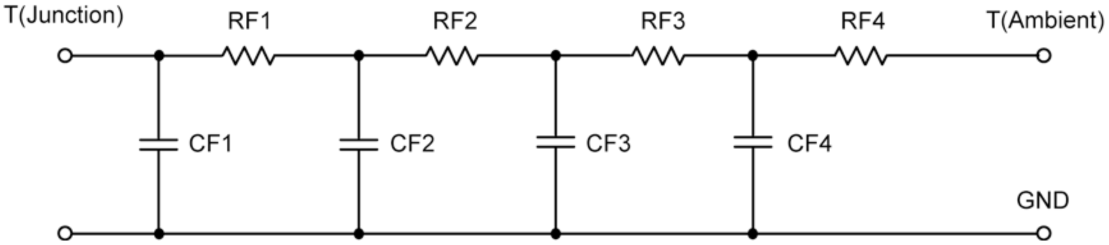
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	15.6155	N/A	2.0508
RT2	17.9066	N/A	8.7476
RT3	11.0643	N/A	7.0539
RT4	50.4136	N/A	4.1477
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	10.8342 m	N/A	696.1390 m
CT2	88.7911 m	N/A	6.3089 m
CT3	861.8672 u	N/A	3.6352 m
CT4	1.5780	N/A	787.0157 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



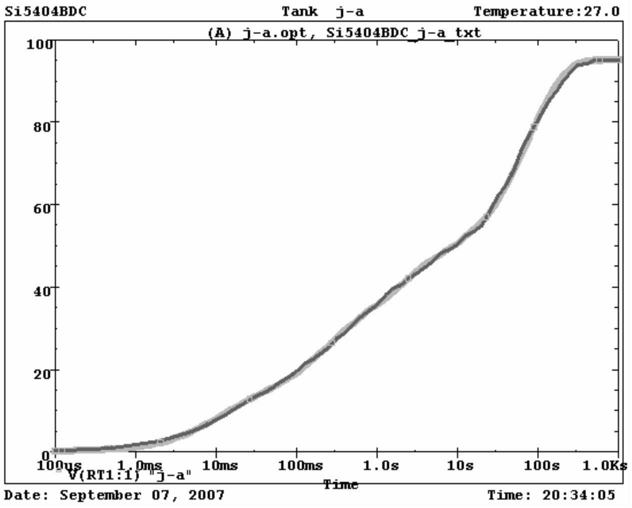
R-C VALUES FOR FILTER CONFIGURATION

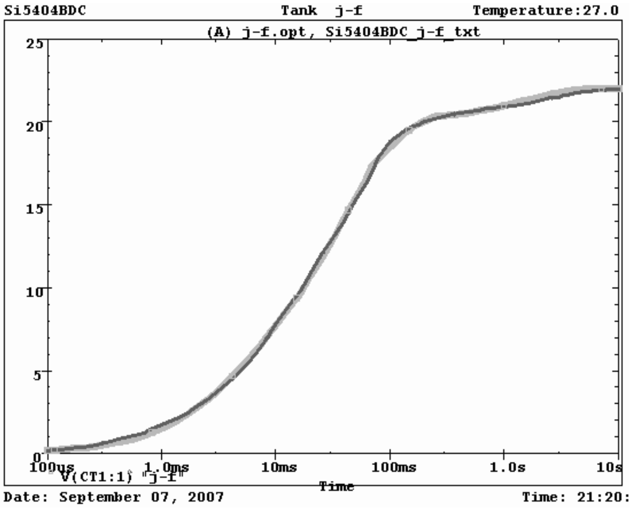
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.7395	N/A	8.8081
RF2	18.9540	N/A	10.9681
RF3	14.5858	N/A	1.2783
RF4	47.7207	N/A	945.5000 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	845.4623 u	N/A	656.2077 u
CF2	11.1567 m	N/A	3.1542 m
CF3	120.0128 m	N/A	349.9774 m
CF4	1.5364	N/A	1.9902

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


Si5404BDC
Tank j-a
Temperature:27.0
(A) j-a.opt, Si5404BDC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: September 07, 2007
Time: 20:34:05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Tank j-f
Temperature:27.0
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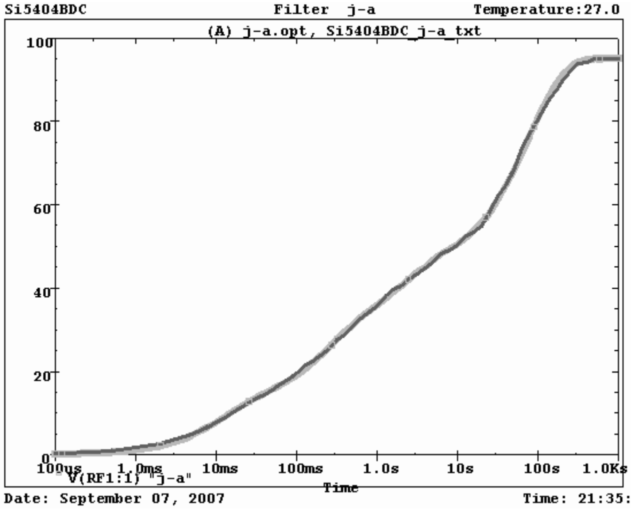
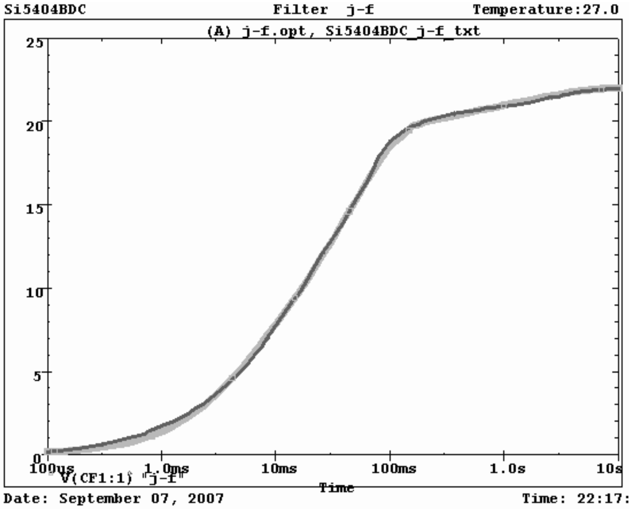
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-f"
Time
Date: September 07, 2007
Time: 21:20:


Si5404BDC
Filter j-a
Temperature:27.0
(A) j-a.opt, Si5404BDC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: September 07, 2007
Time: 21:35:


Si5404BDC
Filter j-f
Temperature:27.0
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20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: September 07, 2007
Time: 22:17: