R-C Thermal Model Parameters

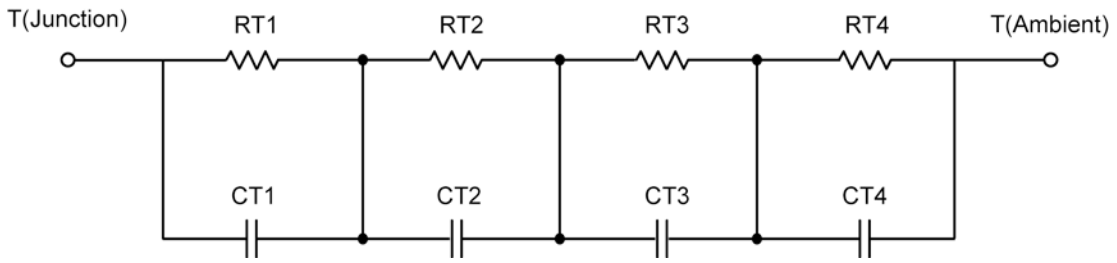
DESCRIPTION

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.

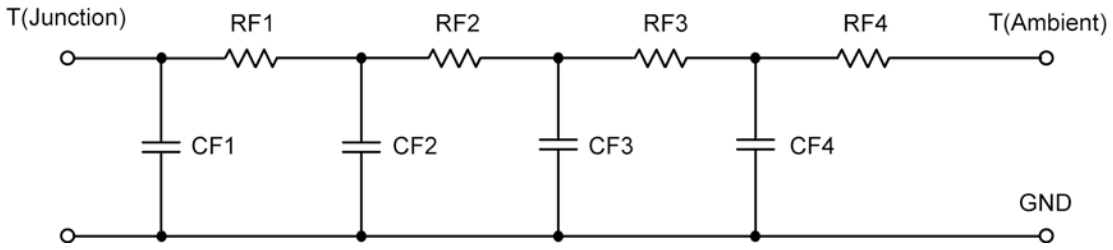
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.0243	N/A	9.2807
RT2	26.4249	N/A	866.9000 m
RT3	9.0631	N/A	8.3064
RT4	51.4877	N/A	3.5460
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.2554 m	N/A	18.3835 m
CT2	58.2479 m	N/A	864.4181 u
CT3	18.2256 m	N/A	124.5286 m
CT4	1.1849	N/A	9.9325 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

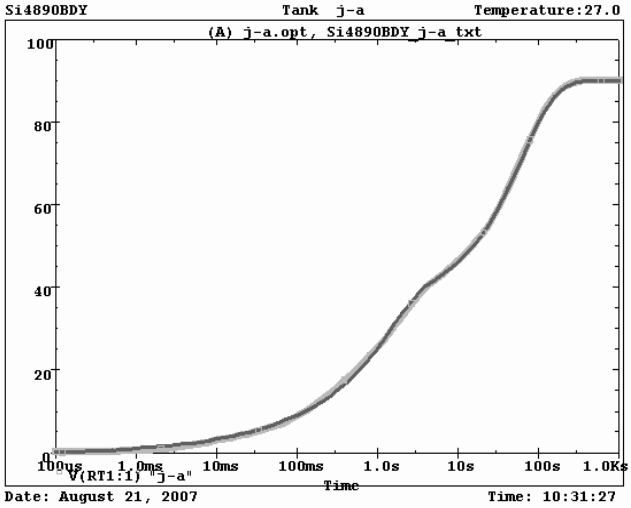


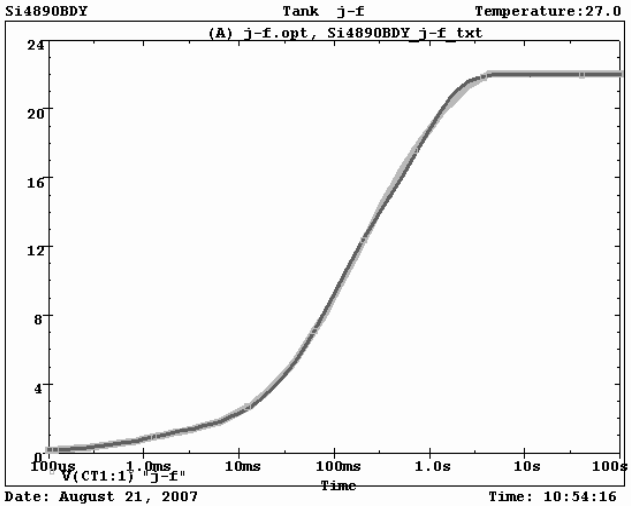
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.5804	N/A	2.1226
RF2	16.0728	N/A	10.7221
RF3	19.5561	N/A	6.9736
RF4	48.7907	N/A	2.1817
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.4630 m	N/A	1.3322 m
CF2	16.7370 m	N/A	7.1994 m
CF3	52.6236 m	N/A	64.3286 m
CF4	1.1788	N/A	101.9103 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


Si4890BDY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4890BDY_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: August 21, 2007
Time: 10:31:27


Si4890BDY
Tank j-f
Temperature:27.0
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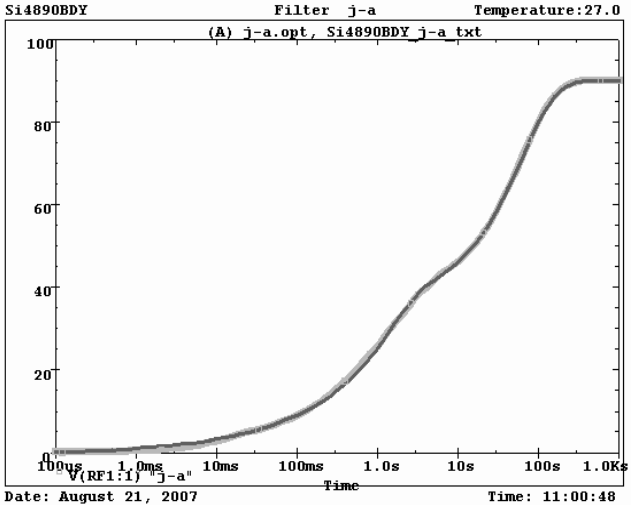
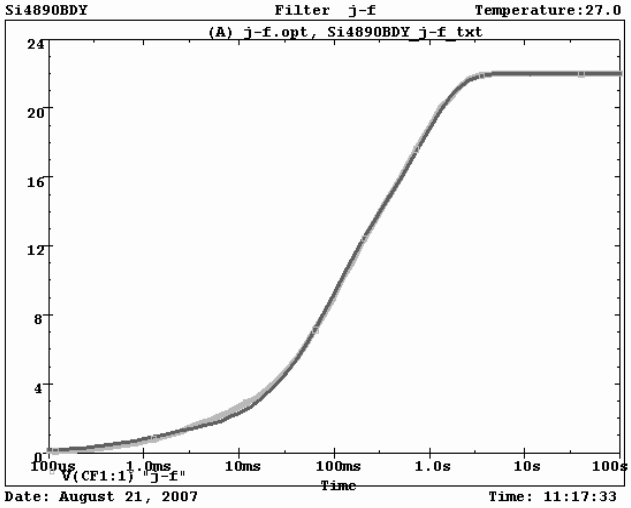
24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1) "j-f"
Time
Date: August 21, 2007
Time: 10:54:16


Si4890BDY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4890BDY_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: August 21, 2007
Time: 11:00:48


Si4890BDY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4890BDY_j-f_txt
24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1) "j-f"
Time
Date: August 21, 2007
Time: 11:17:33