R-C Thermal Model Parameters

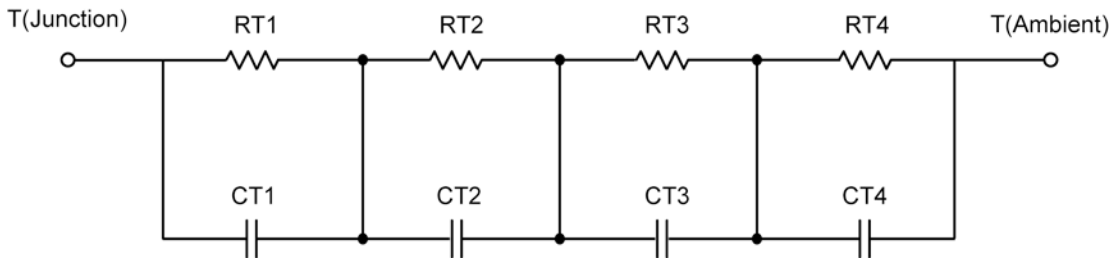
DESCRIPTION

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.

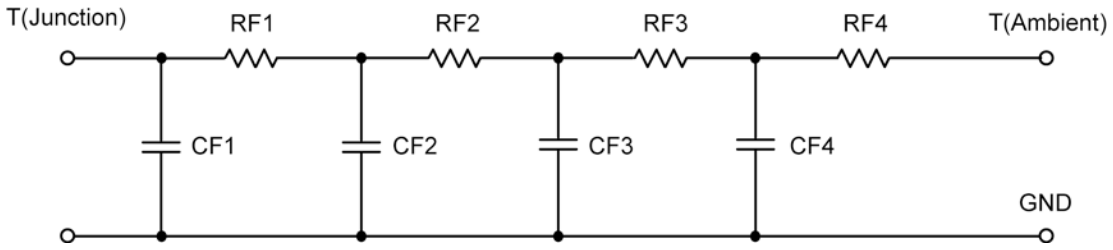
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	19.9646	N/A	186.7000 m
RT2	6.1436	N/A	2.8279
RT3	25.4726	N/A	9.7214
RT4	28.4192	N/A	3.2640
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	83.2736 m	N/A	537.4334 u
CT2	20.4655 m	N/A	56.0989 m
CT3	3.9815	N/A	187.3686 m
CT4	2.2390	N/A	20.3531 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

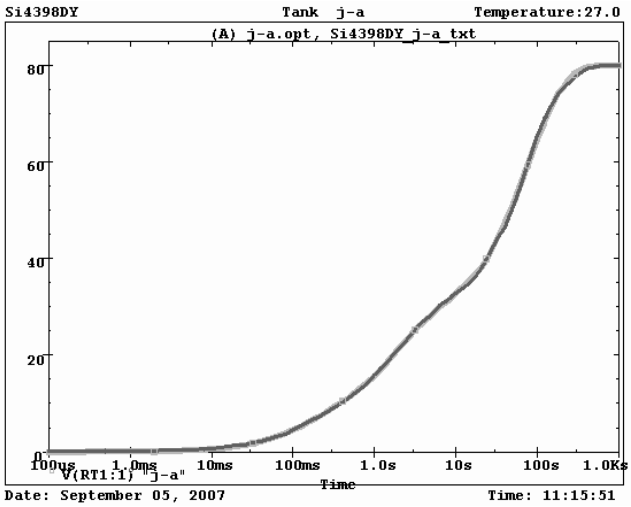


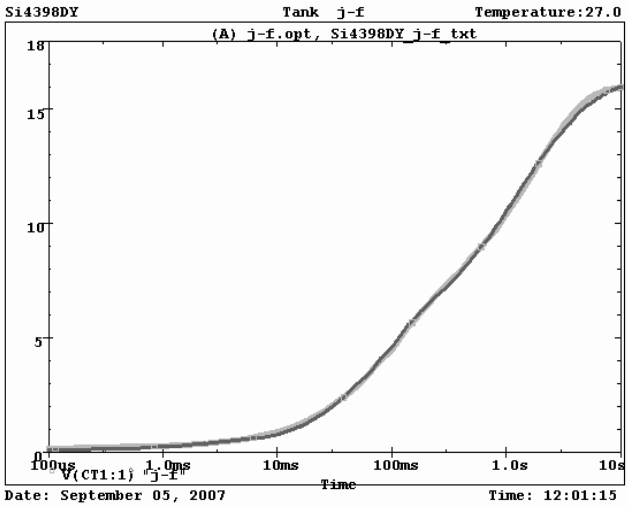
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.7734	N/A	1.1592
RF2	17.2091	N/A	5.7213
RF3	10.6643	N/A	5.5635
RF4	44.3532	N/A	3.5560
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	15.0893 m	N/A	8.4977 m
CF2	51.4696 m	N/A	7.2734 m
CF3	573.3665 m	N/A	133.3399 m
CF4	1.1613	N/A	346.7364 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


Si4398DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4398DY_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: September 05, 2007
Time: 11:15:51


Si4398DY
Tank j-f
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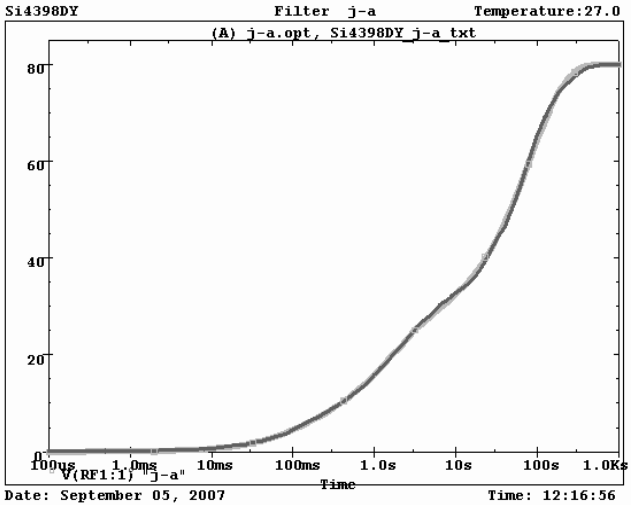
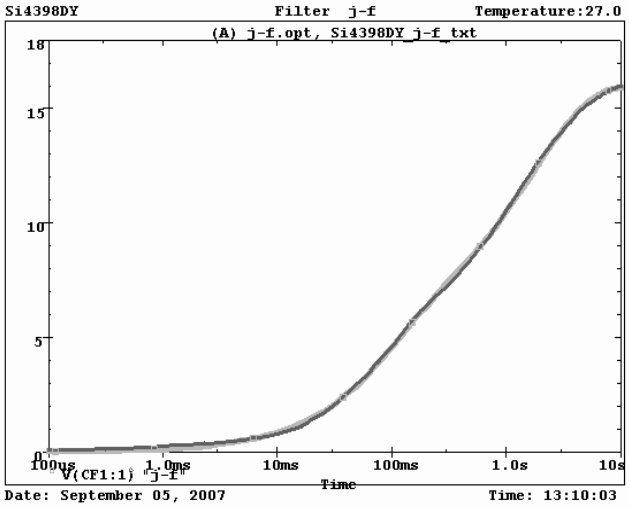
18
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-f"
Time
Date: September 05, 2007
Time: 12:01:15


Si4398DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4398DY_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: September 05, 2007
Time: 12:16:56


Si4398DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4398DY_j-f_txt
18
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: September 05, 2007
Time: 13:10:03