R-C Thermal Model Parameters

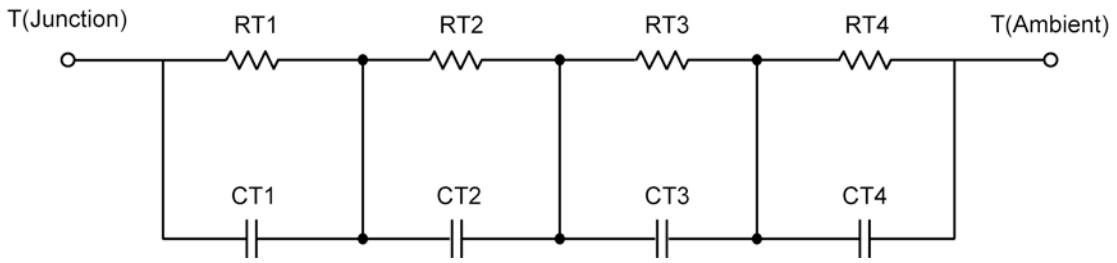
DESCRIPTION

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.

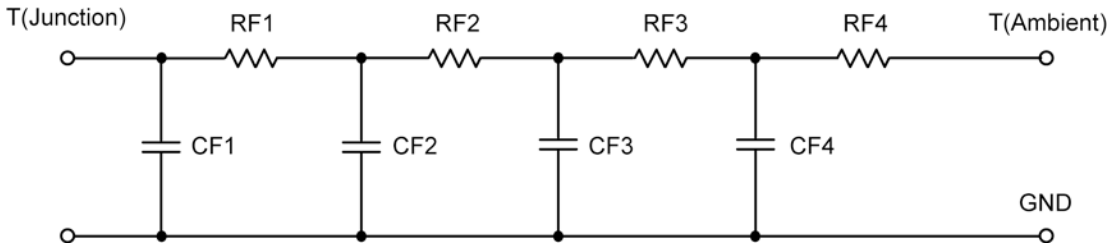
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.3409	N/A	8.3106
RT2	24.9737	N/A	1.7560
RT3	21.5562	N/A	3.6732
RT4	34.1292	N/A	6.2602
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	4.9820 m	N/A	9.8912 m
CT2	534.6732 m	N/A	1.5419 m
CT3	40.1839 m	N/A	663.4727 m
CT4	4.2734	N/A	233.0076 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

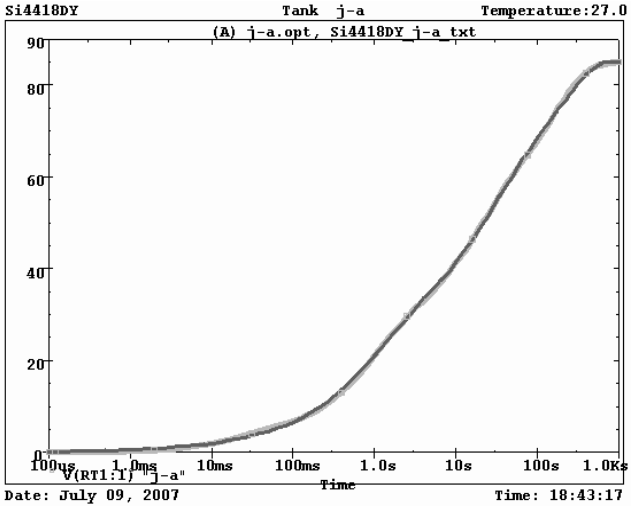


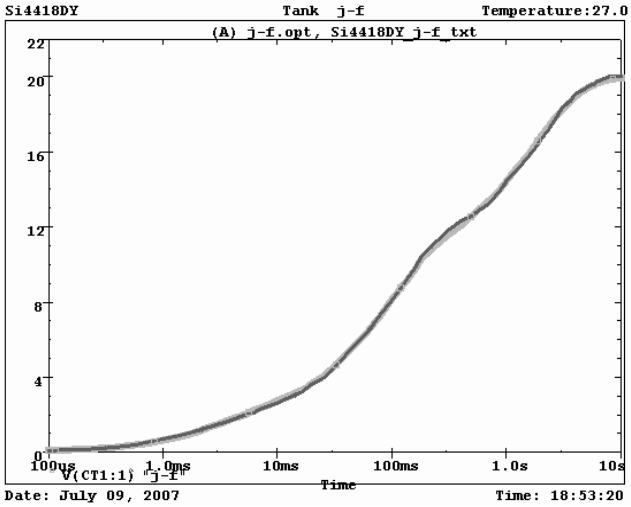
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.9746	N/A	1.7911
RF2	23.5476	N/A	7.0008
RF3	29.3982	N/A	3.0304
RF4	25.0796	N/A	8.1777
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.8029 m	N/A	1.0406 m
CF2	36.6252 m	N/A	7.0542 m
CF3	557.7191 m	N/A	16.9649 m
CF4	5.5742	N/A	208.1899 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


Si4418DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4418DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: July 09, 2007
Time: 18:43:17


Si4418DY
Tank j-f
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20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
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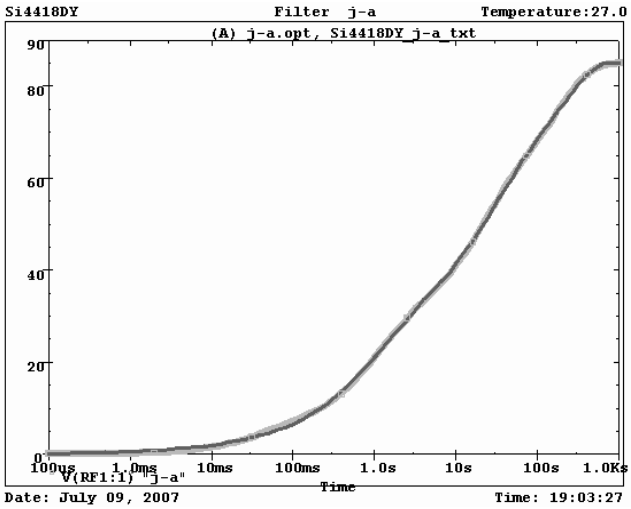
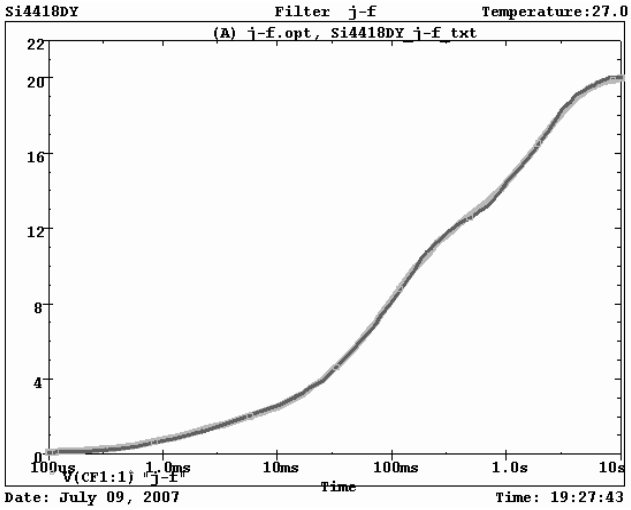
Time
Date: July 09, 2007
Time: 18:53:20


Si4418DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4418DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: July 09, 2007
Time: 19:03:27


Si4418DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4418DY_j-f_txt
22
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: July 09, 2007
Time: 19:27:43