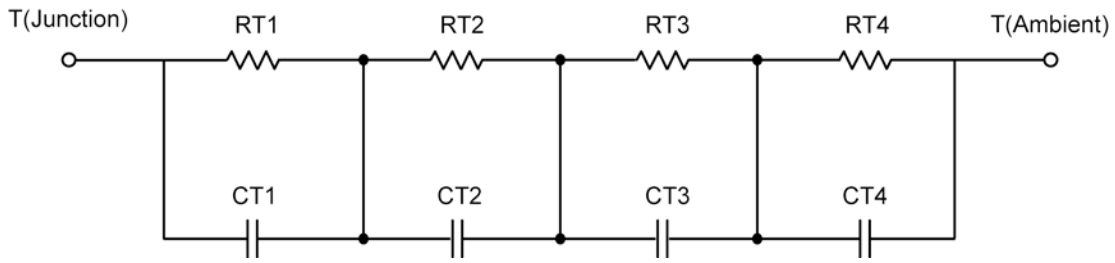
R-C Thermal Model Parameters

DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included. When implemented in P-Spice, these values have matching characteristic curves to the single-pulse transient thermal impedance curves for the MOSFET.

These RC values can be used in the P-SPICE simulation to evaluate the thermal behavior of the MOSFET junction temperature under a defined power profile. These techniques are described in Application Note AN609, "Thermal Simulation of Power MOSFETs on the P-Spice Platform."

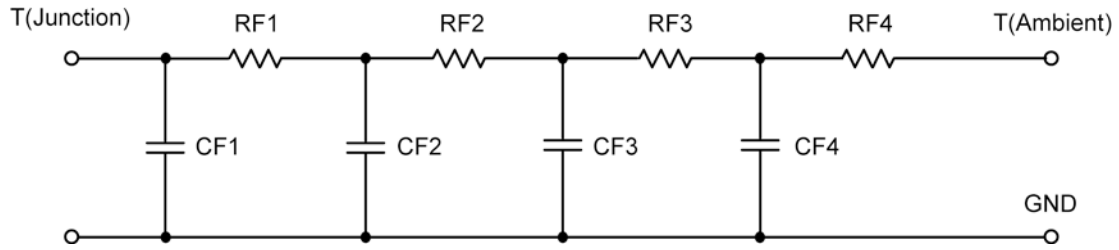
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.9911	N/A	2.1071
RT2	4.8812	N/A	11.3302
RT3	13.2176	N/A	6.4311
RT4	44.9101	N/A	2.1316
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	99.6328 m	N/A	407.0236 m
CT2	1.6908 m	N/A	79.8938 m
CT3	25.2812 m	N/A	10.8470 m
CT4	1.4391	N/A	771.1516 u

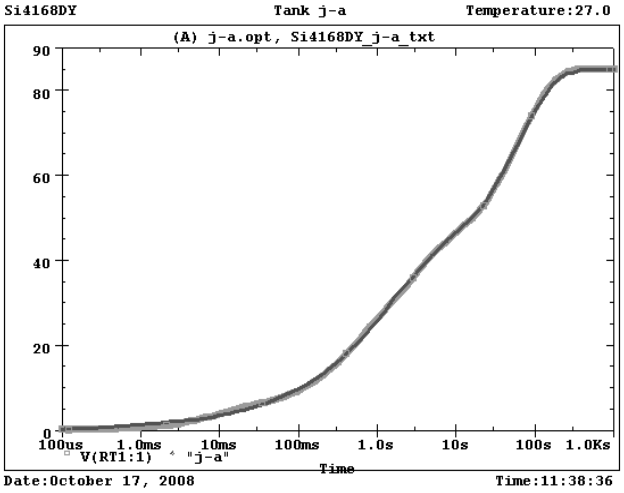
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

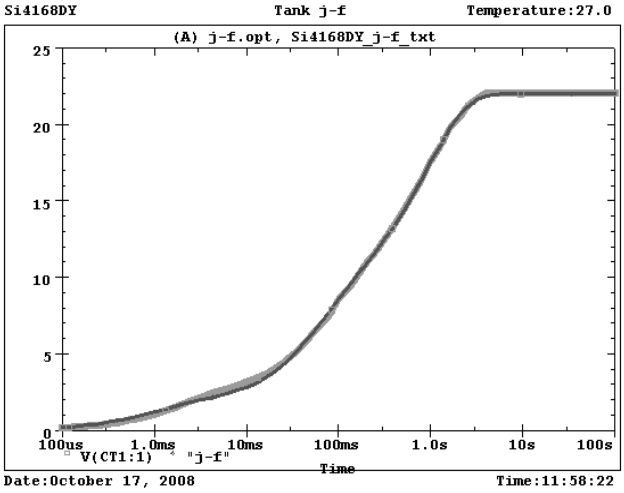
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.8554	N/A	2.4477
RF2	20.5201	N/A	4.5195
RF3	17.5920	N/A	4.3715
RF4	41.0325	N/A	10.6613
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.5987 m	N/A	822.4695 u
CF2	19.4079 m	N/A	8.1293 m
CF3	118.2516 m	N/A	4.2300 m
CF4	1.4594	N/A	70.8548 m

Note
NA indicates not applicable


Si4168DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4168DY_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:October 17, 2008
Time:11:38:36


Si4168DY
Tank j-f
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20
15
10
5
0
100us
1.0ms
10ms
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1.0s
10s
100s
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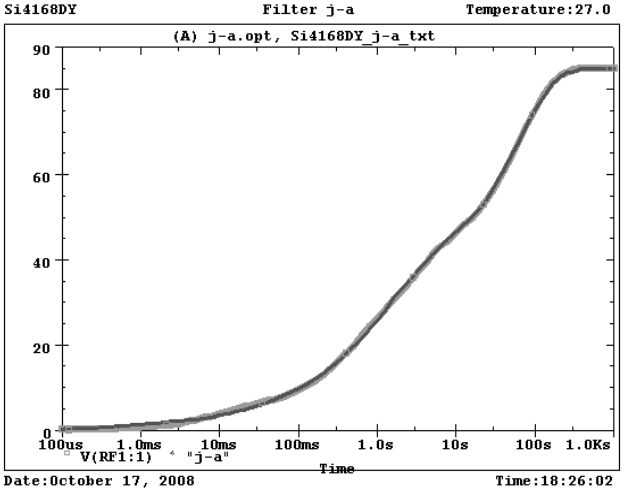
Time
Date:October 17, 2008
Time:11:58:22


Si4168DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4168DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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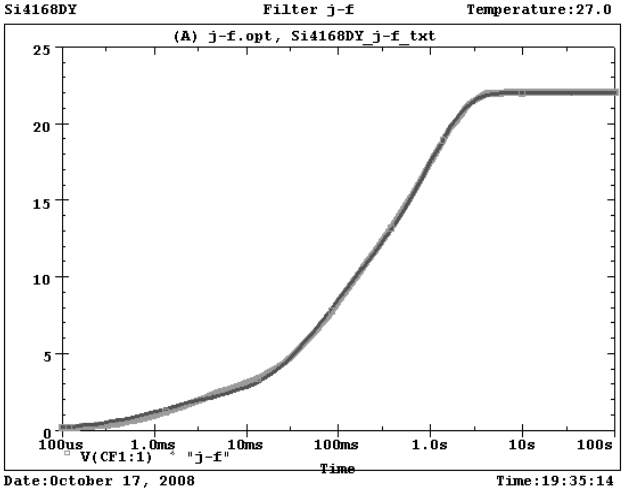
"j-a"
Time
Date:October 17, 2008
Time:18:26:02


Si4168DY
Filter j-f
Temperature:27.0
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25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date:October 17, 2008
Time:19:35:14