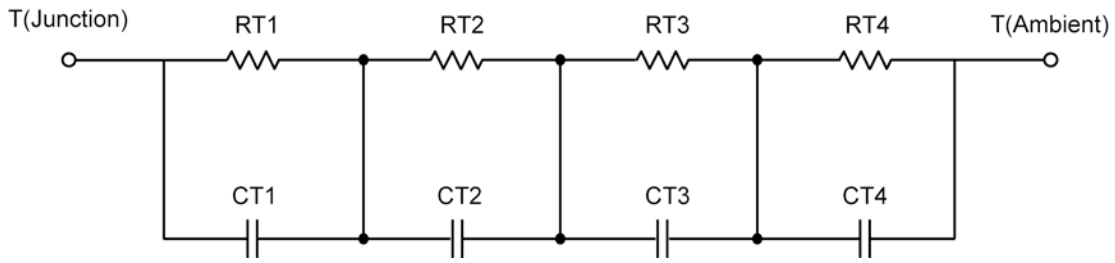
R-C Thermal Model Parameters

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."

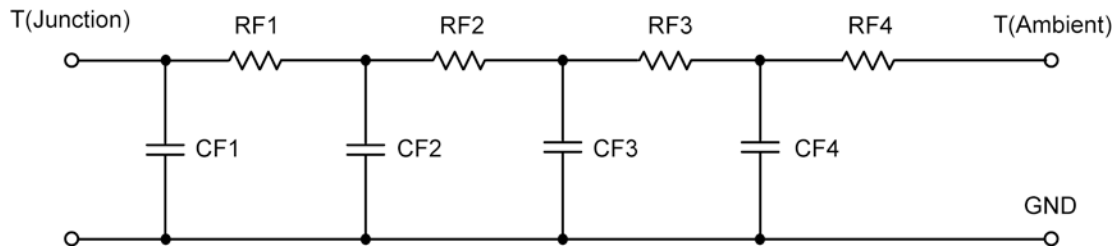
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.2619	68.9152 m	N/A
RT2	26.8483	445.9590 m	N/A
RT3	15.5119	109.9461 m	N/A
RT4	4.3779	575.1797 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	234.3346 m	12.8020 m	N/A
CT2	1.5117	210.4738 m	N/A
CT3	12.1339	960.5962 u	N/A
CT4	30.1774 m	24.7020 m	N/A

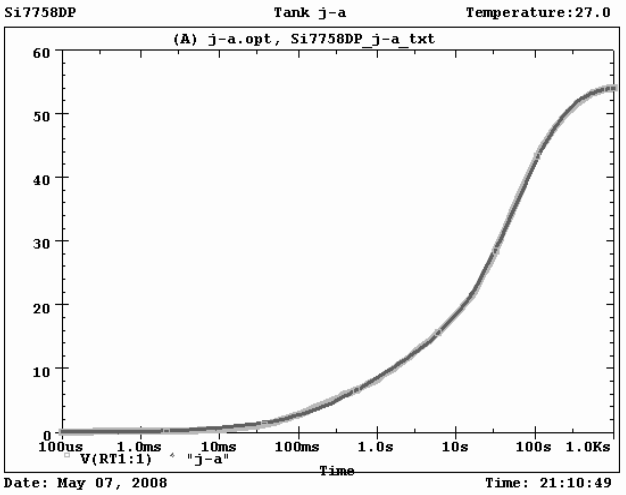
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

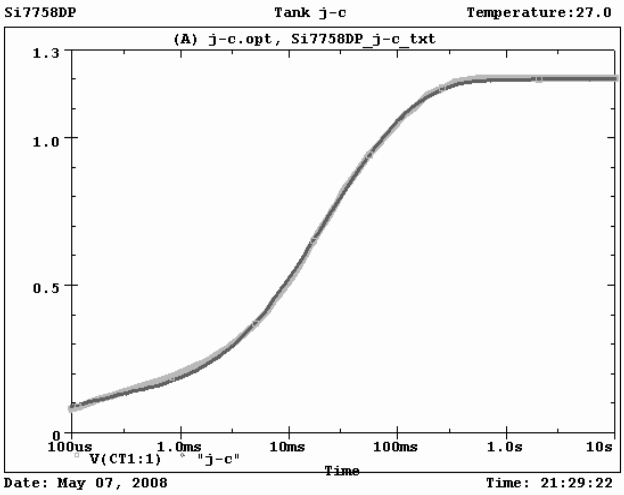
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.0018	154.3155 m	N/A
RF2	8.0355	74.0544 m	N/A
RF3	24.1888	569.5565 m	N/A
RF4	17.7739	402.0736 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	21.1788 m	1.0319 m	N/A
CF2	106.2154 m	14.8457 m	N/A
CF3	924.4148 m	2.8425 m	N/A
CF4	5.9084	175.4168 m	N/A

Note
NA indicates not applicable


Si7758DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7758DP_j-a_txt
60
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: May 07, 2008
Time: 21:10:49


Si7758DP
Tank j-c
Temperature:27.0
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1.0
0.5
0
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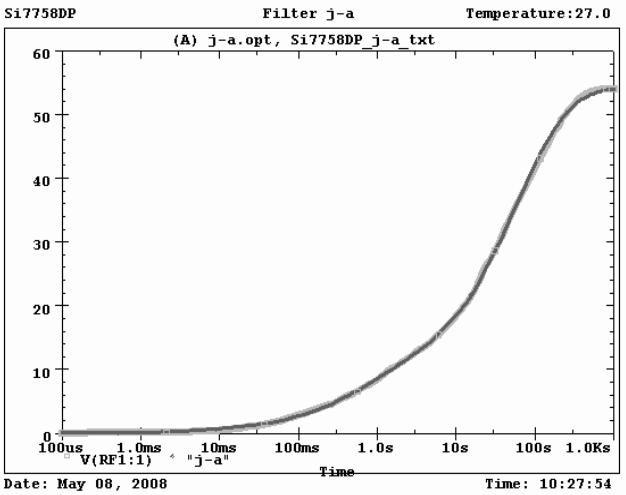
Time: 21:29:22


Si7758DP
Filter j-a
Temperature:27.0
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60
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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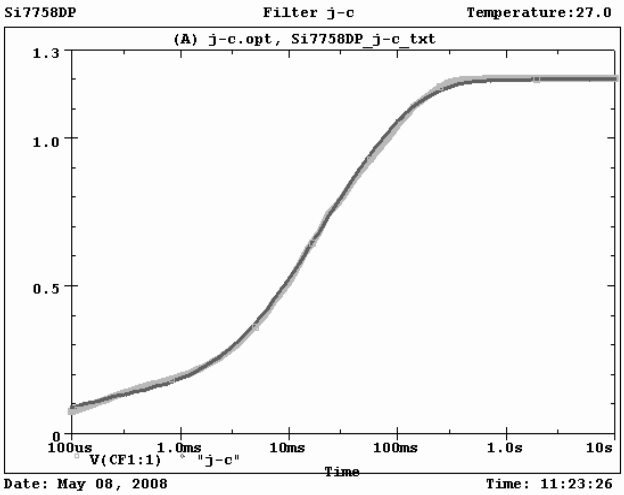
Time
Date: May 08, 2008
Time: 10:27:54


Si7758DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7758DP_j-c_txt
1.3
1.0
0.5
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-c"
Time
Date: May 08, 2008
Time: 11:23:26