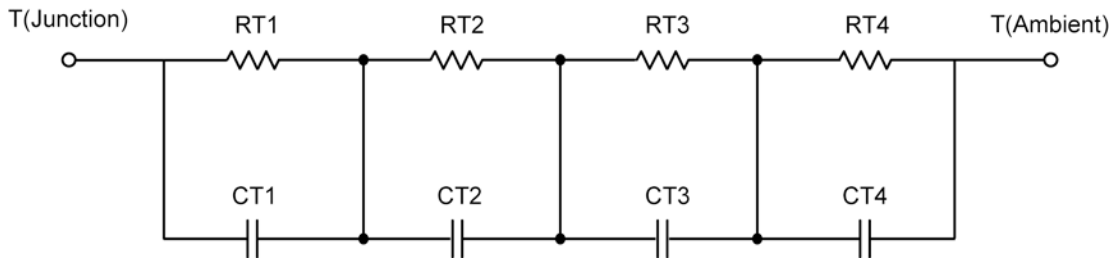
R-C Thermal Model Parameters

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."

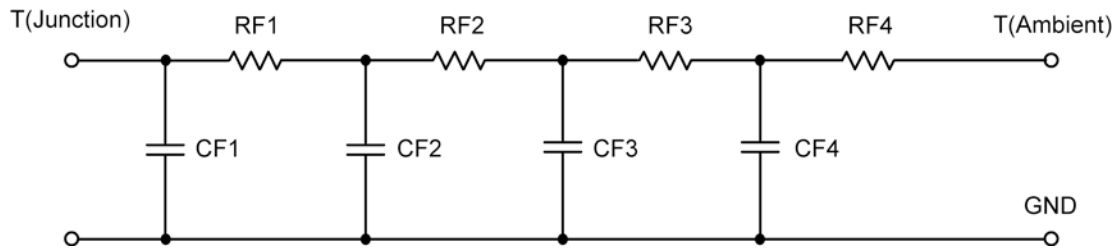
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	64.0163	N/A	12.7602
RT2	5.1154	N/A	3.1537
RT3	46.1720	N/A	16.7148
RT4	50.6963	N/A	37.3713
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3888	N/A	2.5036 m
CT2	137.7504 u	N/A	125.7713 u
CT3	24.3796 m	N/A	75.8127 m
CT4	2.2490 m	N/A	8.9659 m

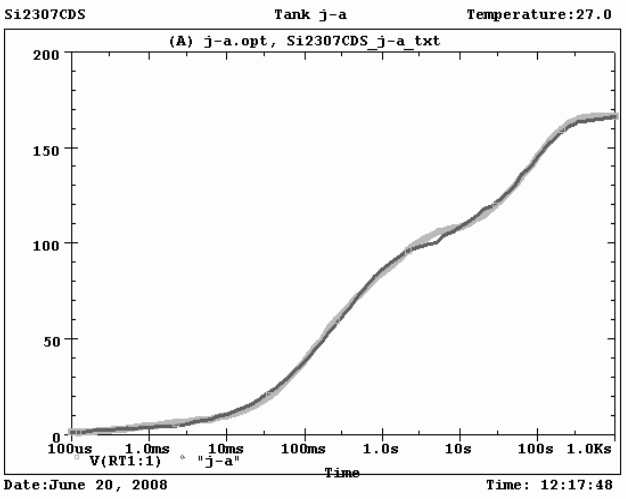
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

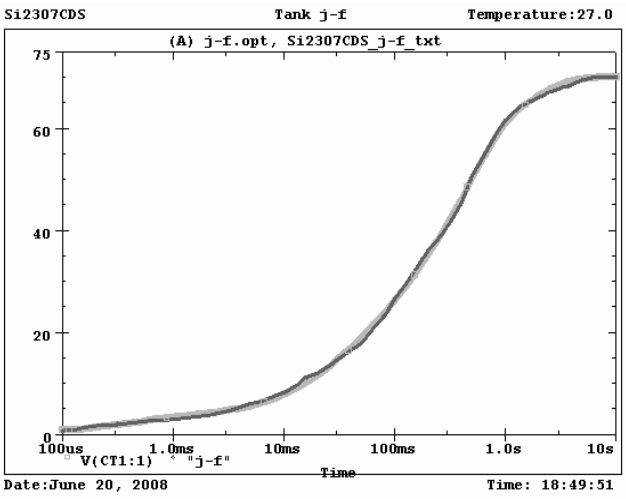
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.2005	N/A	3.7905
RF2	53.7662	N/A	20.0274
RF3	37.4273	N/A	30.1322
RF4	66.6060	N/A	16.0499
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	152.5807 u	N/A	137.0612 u
CF2	2.0909 m	N/A	1.8875 m
CF3	16.8484 m	N/A	5.9845 m
CF4	1.1689	N/A	38.8486 m

Note
NA indicates not applicable


Si2307CDS
Tank j-a
Temperature:27.0
(A) j-a.opt, Si2307CDS_j-a_txt
200
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date:June 20, 2008
Time: 12:17:48


Si2307CDS
Tank j-f
Temperature:27.0
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75
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s
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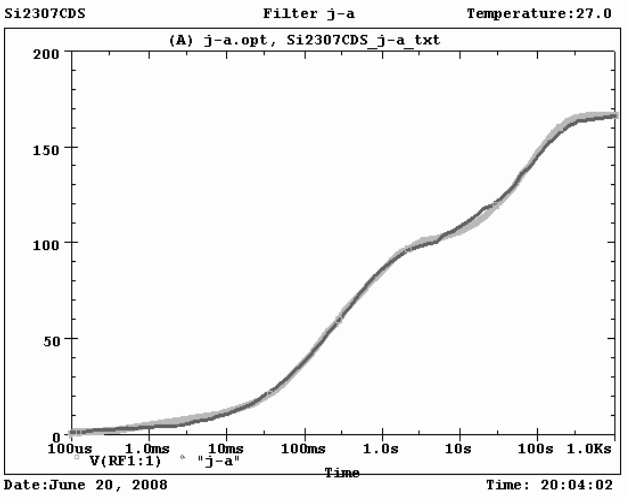
Time
Date:June 20, 2008
Time: 18:49:51


Si2307CDS
Filter j-a
Temperature:27.0
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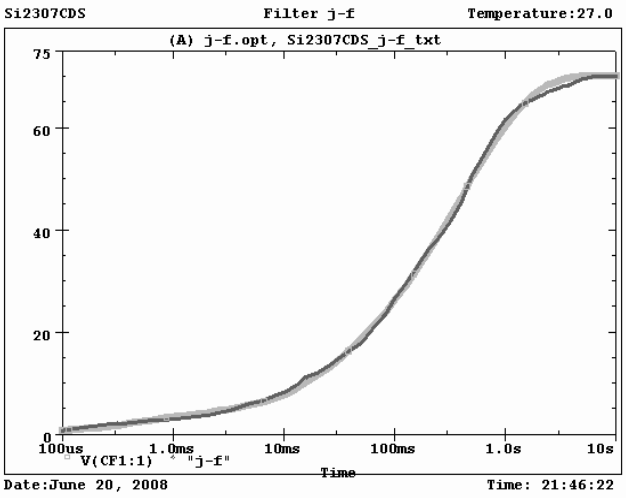
200
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RF1:1) "j-a"
Time
Date:June 20, 2008
Time: 20:04:02


Si2307CDS
Filter j-f
Temperature:27.0
(A) j-f.opt, Si2307CDS_j-f_txt
75
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date:June 20, 2008
Time: 21:46:22