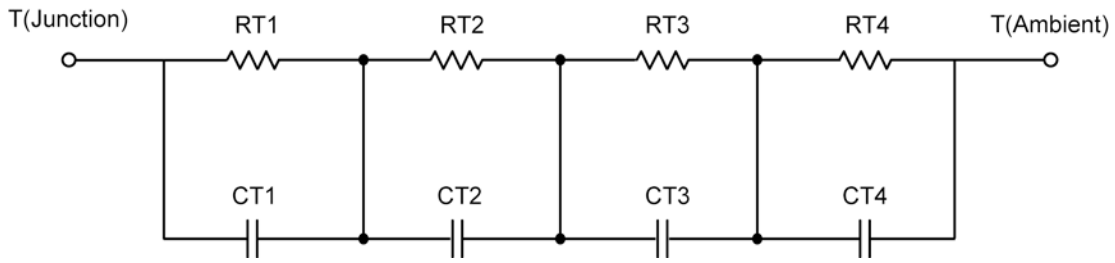
R-C Thermal Model Parameters

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."

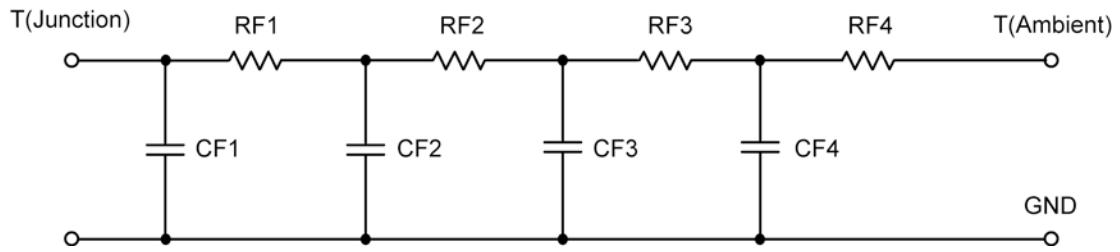
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	36.8796	N/A	38.7699
RT2	74.9180	N/A	21.1452
RT3	6.5691	N/A	3.3528
RT4	47.6333	N/A	9.7321
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	988.0938 u	N/A	18.7339 m
CT2	4.2497 m	N/A	8.2436 m
CT3	30.0325 u	N/A	137.2774 u
CT4	2.7137	N/A	2.5016 m

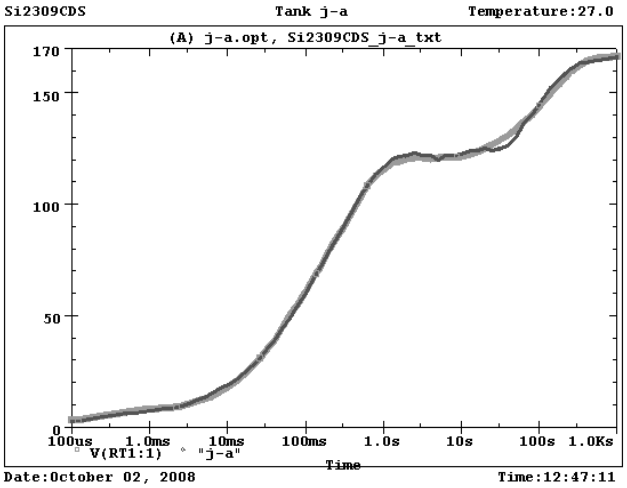
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

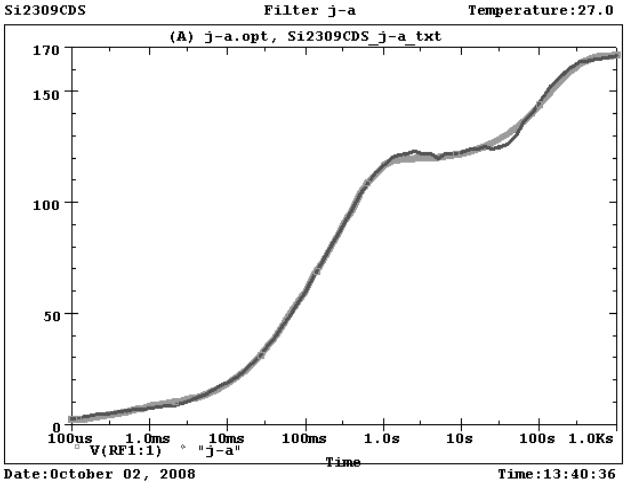
R-C THERMAL MODEL FOR FILTER CONFIGURATION

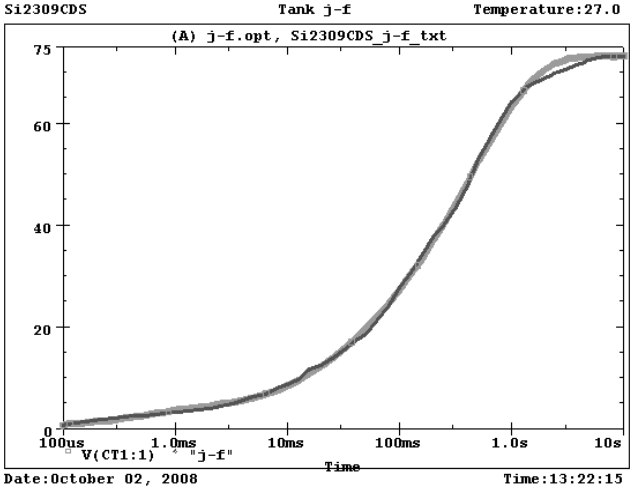


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.6985	N/A	5.4401
RF2	52.0151	N/A	23.9941
RF3	58.1285	N/A	38.1853
RF4	47.1579	N/A	5.3805
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	53.7072 u	N/A	218.0438 u
CF2	807.9346 u	N/A	2.1222 m
CF3	4.1091 m	N/A	8.3141 m
CF4	2.7898	N/A	396.7079 m

Note
NA indicates not applicable


Si2309CDS
Tank j-a
Temperature:27.0
(A) j-a.opt, Si2309CDS_j-a_txt
170
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:October 02, 2008
Time:12:47:11


Si2309CDS
Filter j-a
Temperature:27.0
(A) j-a.opt, Si2309CDS_j-a_txt
170
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:October 02, 2008
Time:13:40:36


Si2309CDS
Tank j-f
Temperature:27.0
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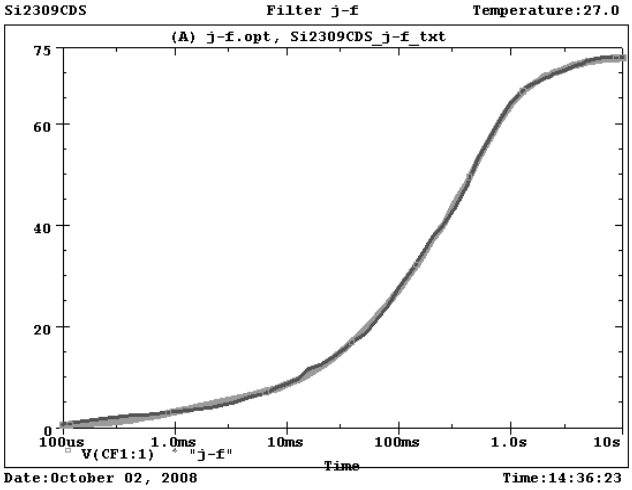
75
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)
"j-f"
Time
Date:October 02, 2008
Time:13:22:15


Si2309CDS
Filter j-f
Temperature:27.0
(A) j-f.opt, Si2309CDS_j-f_txt
75
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:October 02, 2008
Time:14:36:23