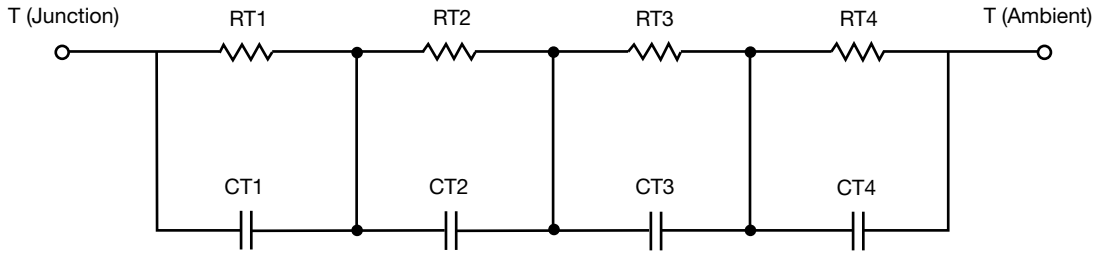
R-C Thermal Model Parameters

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

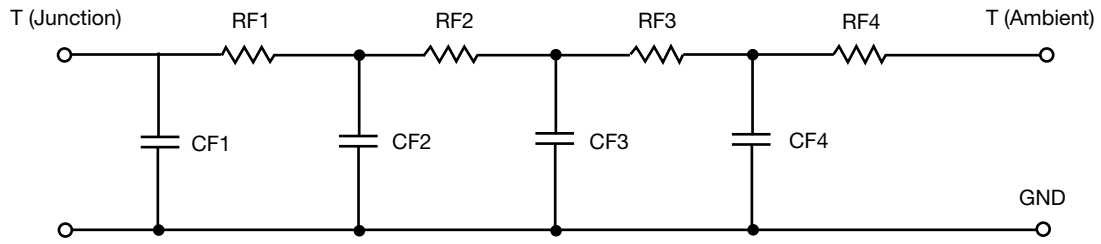


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.2521	1.2565	N/A
RT2	5.6353	1.4156	N/A
RT3	15.7560	819.9724m	N/A
RT4	34.6140	995.4286m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3561	133.2586m	N/A
CT2	6.0190m	41.8505m	N/A
CT3	89.9191m	1.3076m	N/A
CT4	2.3342	40.1696m	N/A

Note
N/A indicates not applicable

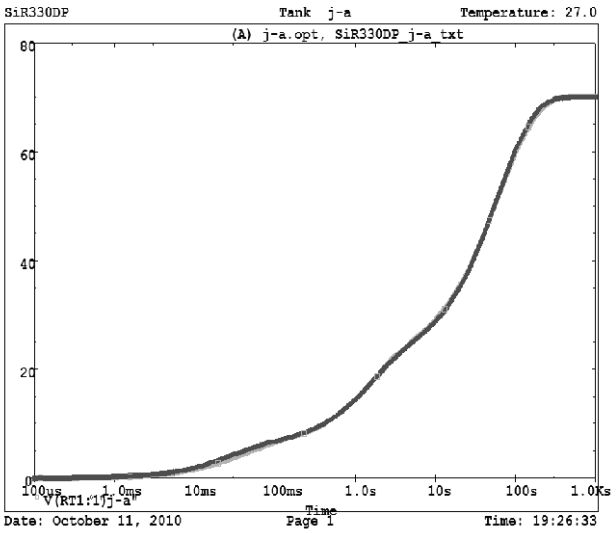
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

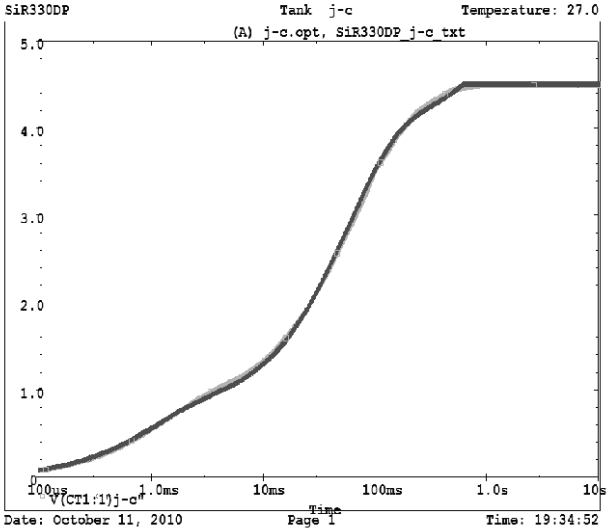
R-C THERMAL MODEL FOR FILTER CONFIGURATION

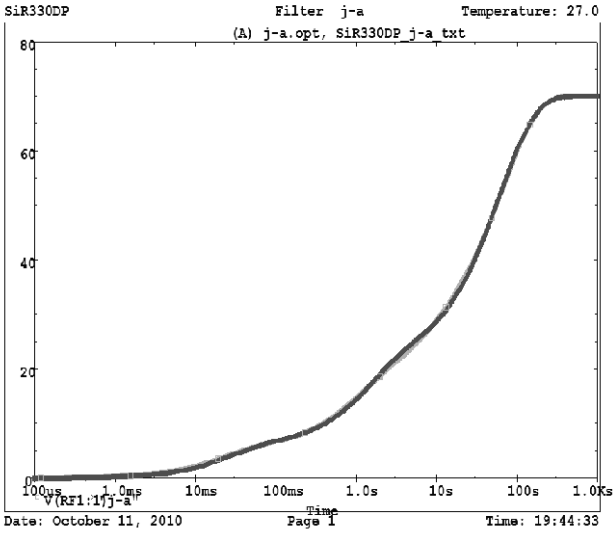


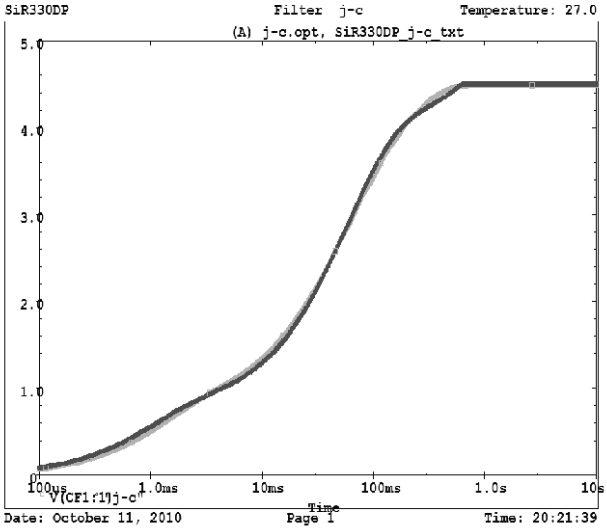
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.8500	943.1107m	N/A
RF2	13.8173	2.5009	N/A
RF3	15.7394	887.8703m	N/A
RF4	34.6671	155.5256m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.5653m	1.4179m	N/A
CF2	64.4656m	15.2645m	N/A
CF3	538.4560m	88.9175m	N/A
CF4	1.2218	203.4743m	N/A

Note
N/A indicates not applicable


SiR330DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR330DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: October 11, 2010
Page 1
Time: 19:26:33


SiR330DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiR330DP_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: October 11, 2010
Page 1
Time: 19:34:52


SiR330DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR330DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 11, 2010
Page 1
Time: 19:44:33


SiR330DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR330DP_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: October 11, 2010
Page 1
Time: 20:21:39