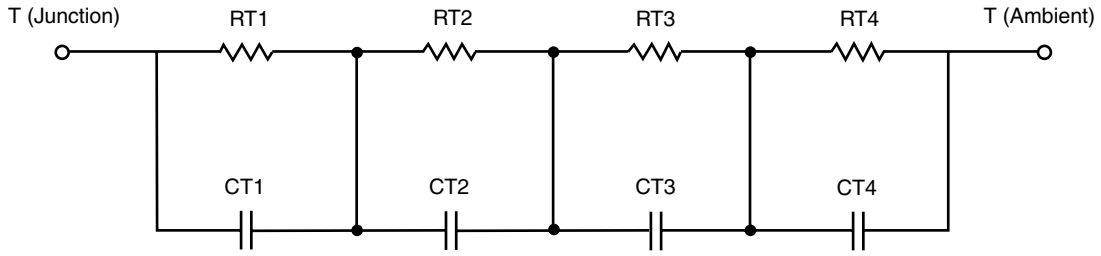
R-C Thermal Model Parameters

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

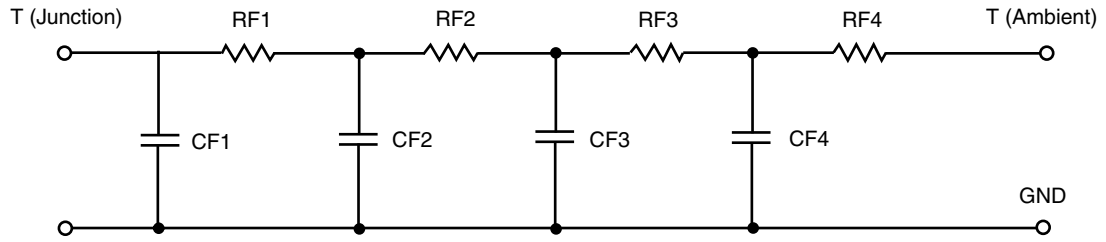


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.4778	446.0400 m	N/A
RT2	30.4845	145.5138 m	N/A
RT3	3.3774	112.8988 m	N/A
RT4	6.6603	493.5761 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3371	132.3083 m	N/A
CT2	3.6020	945.0853 m	N/A
CT3	28.5621 m	176.3257 u	N/A
CT4	160.5314 m	17.2533 m	N/A

Note
N/A indicates not applicable

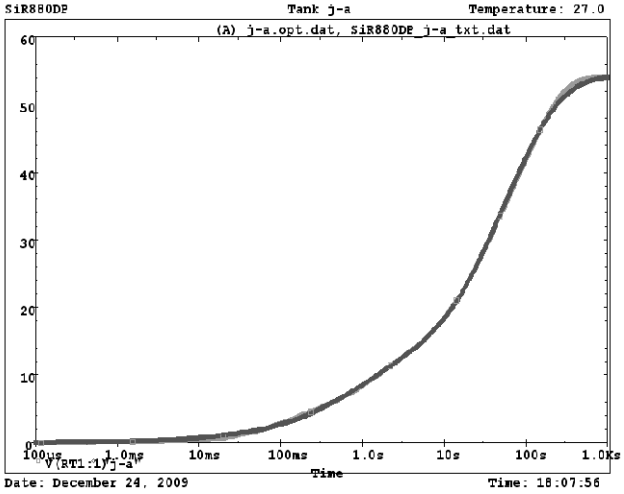
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

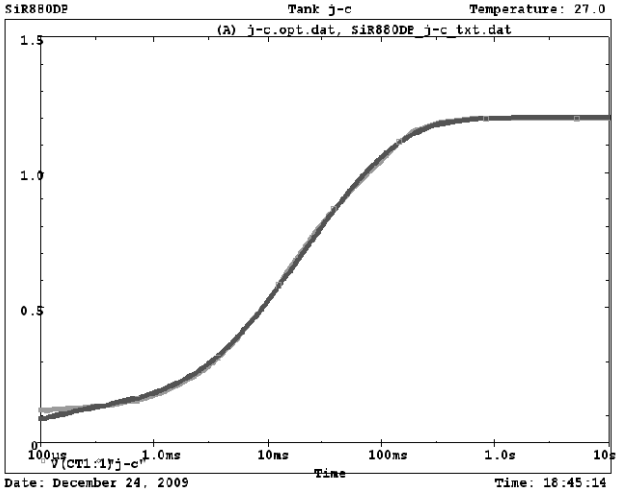
R-C THERMAL MODEL FOR FILTER CONFIGURATION

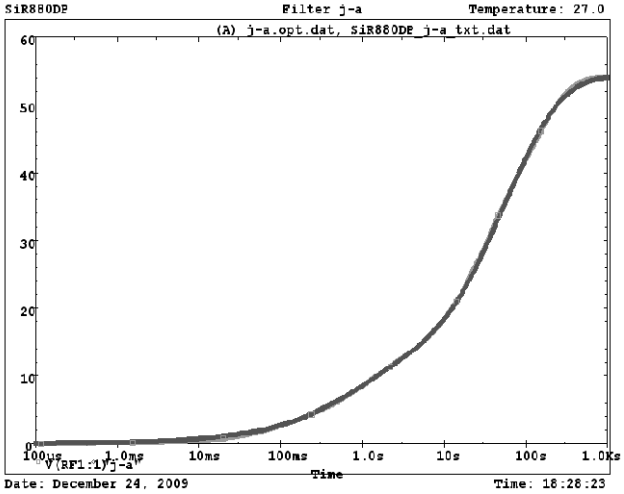


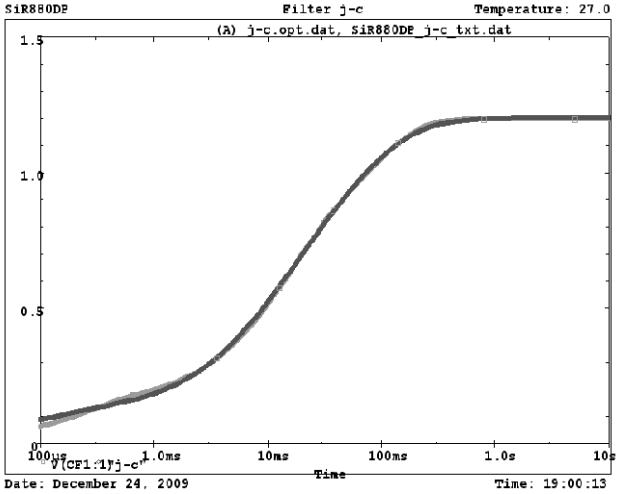
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.0018	172.8038 m	N/A
RF2	7.8355	338.3742 m	N/A
RF3	25.1329	338.5995 m	N/A
RF4	17.0298	346.6580 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	23.9890 m	1.3023 m	N/A
CF2	97.5121 m	17.3617 m	N/A
CF3	922.4918 m	5.0534 m	N/A
CF4	6.2118	201.5394 m	N/A

Note
N/A indicates not applicable


SiR880DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR880DP_j-a_txt.dat
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: December 24, 2009
Time: 18:07:56


SiR880DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR880DP_j-c_txt.dat
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)/j-c
Time
Date: December 24, 2009
Time: 18:45:14


SiR880DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR880DP_j-a_txt.dat
60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a
Time
Date: December 24, 2009
Time: 18:28:23


SiR880DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR880DP_j-c_txt.dat
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)/j-c
Time
Date: December 24, 2009
Time: 19:00:13