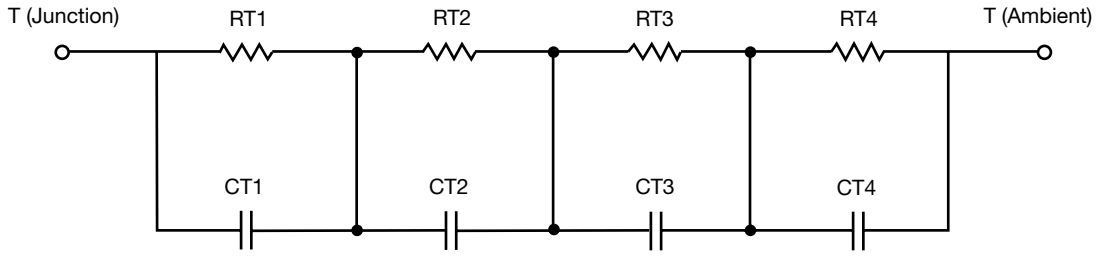
R-C Thermal Model Parameters

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

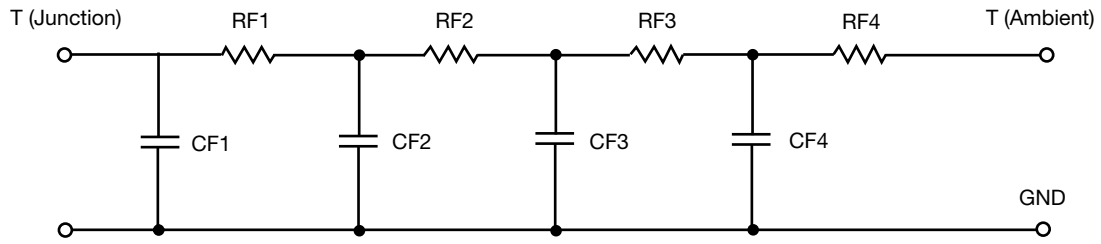


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	24.9370	470.0433 m	N/A
RT2	24.2258	472.2472 m	N/A
RT3	11.5298	346.3356 m	N/A
RT4	4.5429	712.0011 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.6923	39.0745 m	N/A
CT2	3.9272	2.0466 m	N/A
CT3	125.4475 m	50.5709 m	N/A
CT4	20.3854 m	16.3882 m	N/A

Note
N/A indicates not applicable

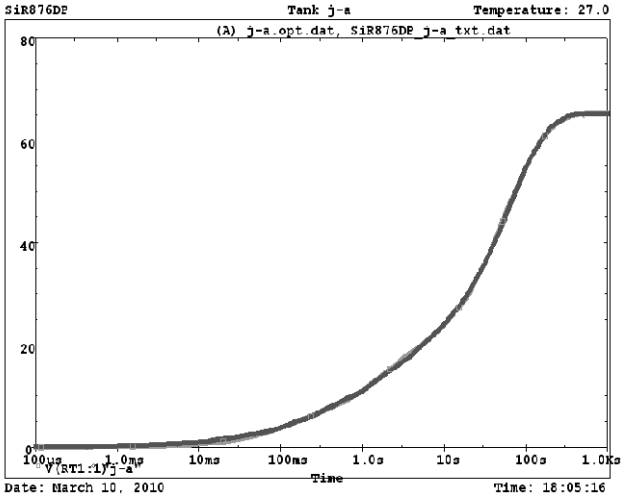
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

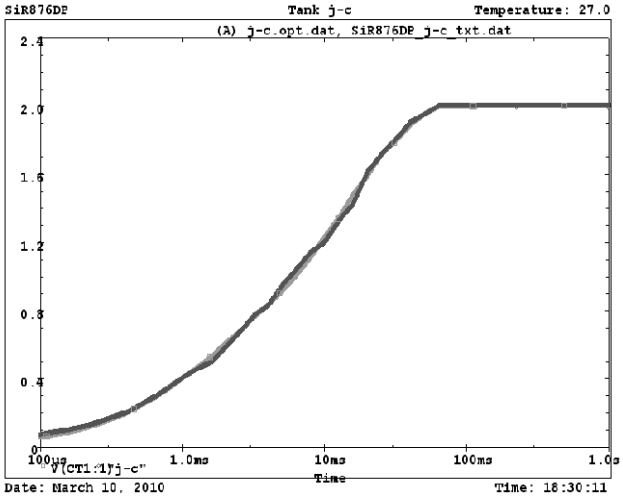
R-C THERMAL MODEL FOR FILTER CONFIGURATION

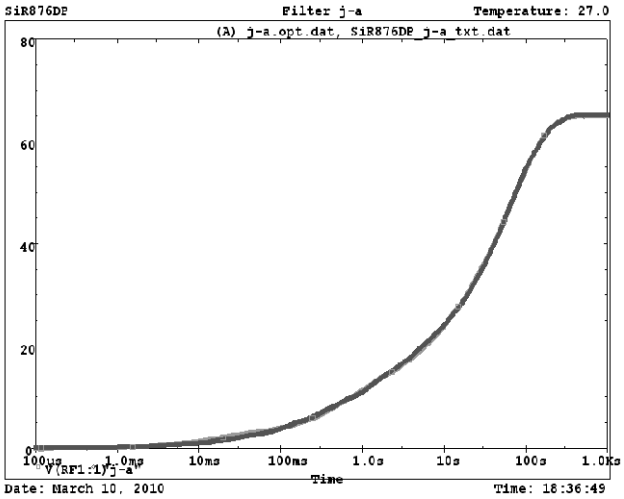


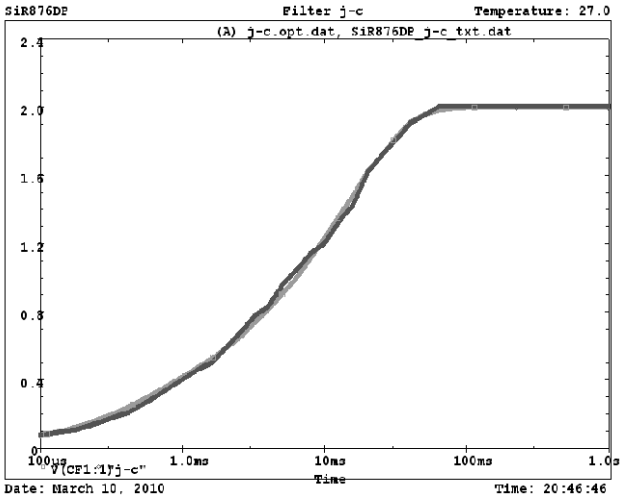
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.8691	444.7032 m	N/A
RF2	10.6779	548.4266 m	N/A
RF3	18.4489	676.7910 m	N/A
RF4	32.9376	326.5207 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.3557 m	1.2253 m	N/A
CF2	54.5326 m	4.4601 m	N/A
CF3	541.4038 m	6.0542 m	N/A
CF4	1.3938	5.4308 m	N/A

Note
N/A indicates not applicable


SiR876DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR876DP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: March 10, 2010
Time: 18:05:16


SiR876DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR876DP_j-c_txt.dat
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: March 10, 2010
Time: 18:30:11


SiR876DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR876DP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: March 10, 2010
Time: 18:36:49


SiR876DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR876DP_j-c_txt.dat
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: March 10, 2010
Time: 20:46:46