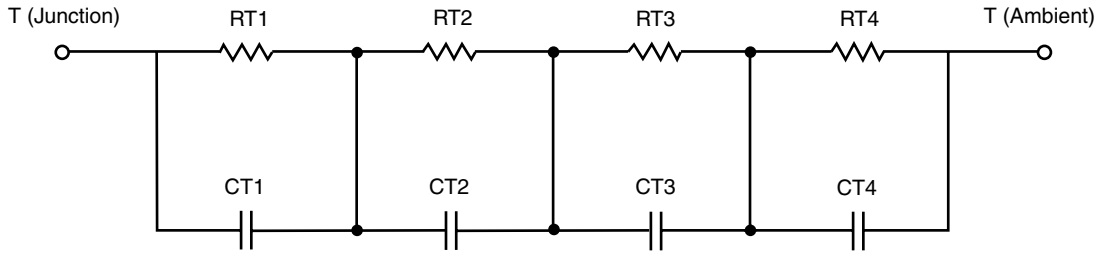
R-C Thermal Model Parameters

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

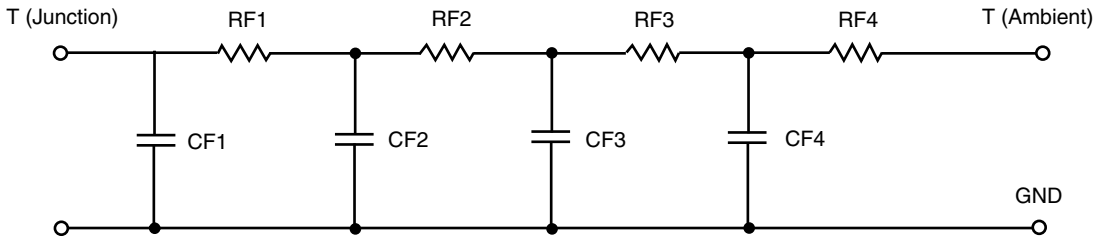


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.3585	12.7597 m	N/A
RT2	9.8253	961.4694 m	N/A
RT3	7.7878	1.9827	N/A
RT4	49.8970	1.5430	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.6321 m	57.7701 m	N/A
CT2	348.3272 m	635.4832 u	N/A
CT3	29.7100 m	5.5230 m	N/A
CT4	1.3861	3.7586 m	N/A

Note
N/A indicates not applicable

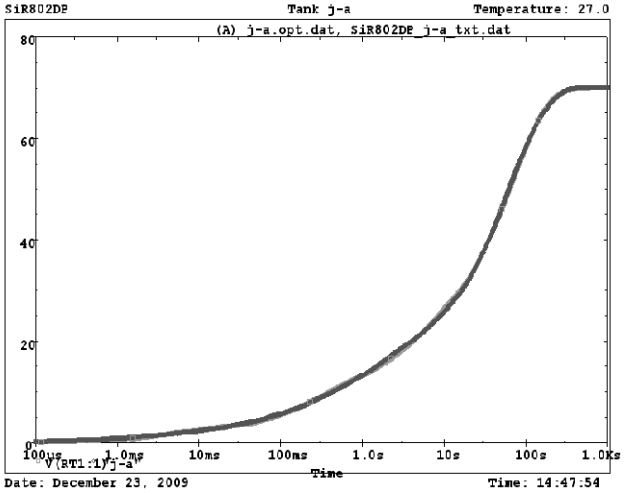
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

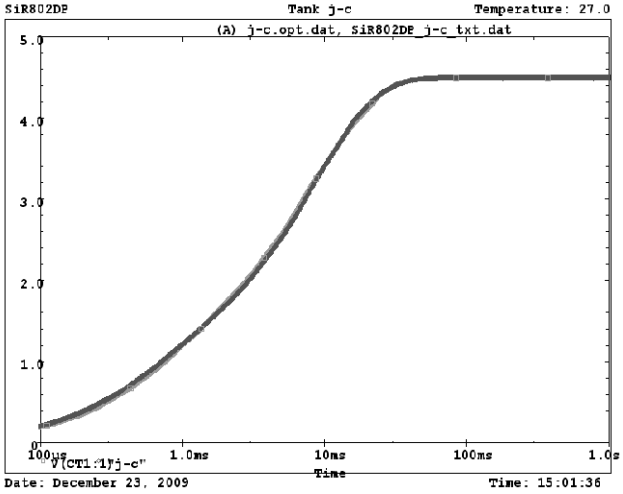
R-C THERMAL MODEL FOR FILTER CONFIGURATION

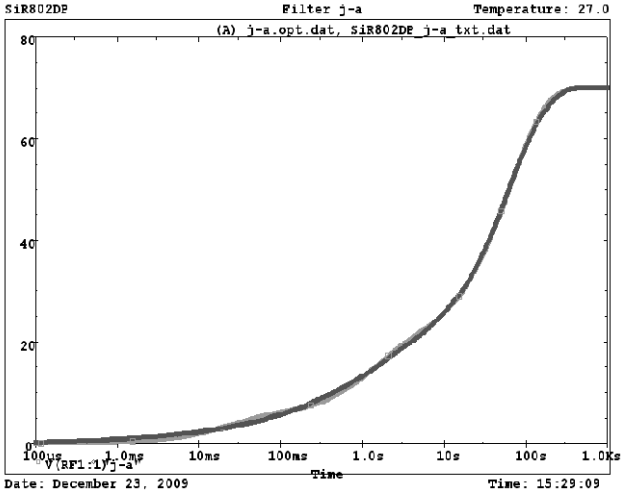


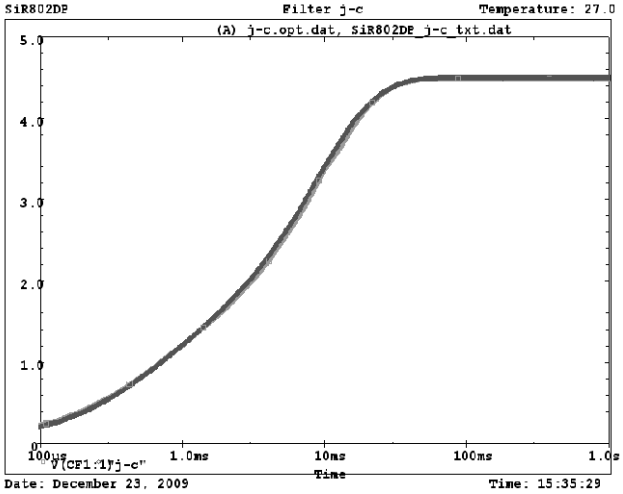
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.5746	9.5990 m	N/A
RF2	4.9275	1.3287	N/A
RF3	9.9581	1.7923	N/A
RF4	49.5398	1.3586	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.0813 m	264.8638 u	N/A
CF2	88.1824 m	146.4623 u	N/A
CF3	185.3169 u	2.2268 m	N/A
CF4	1.2406	537.0081 u	N/A

Note
N/A indicates not applicable


SiR802DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR802DP_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: December 23, 2009
Time: 14:47:54


SiR802DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR802DP_j-c_txt.dat
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: December 23, 2009
Time: 15:01:36


SiR802DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR802DP_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: December 23, 2009
Time: 15:29:09


SiR802DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR802DP_j-c_txt.dat
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: December 23, 2009
Time: 15:35:29