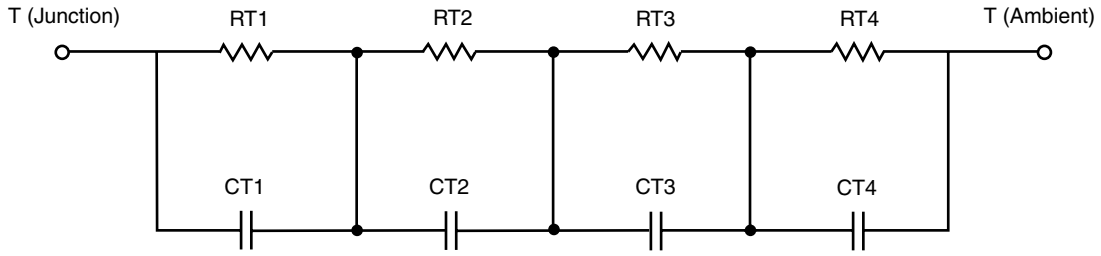
R-C Thermal Model Parameters

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

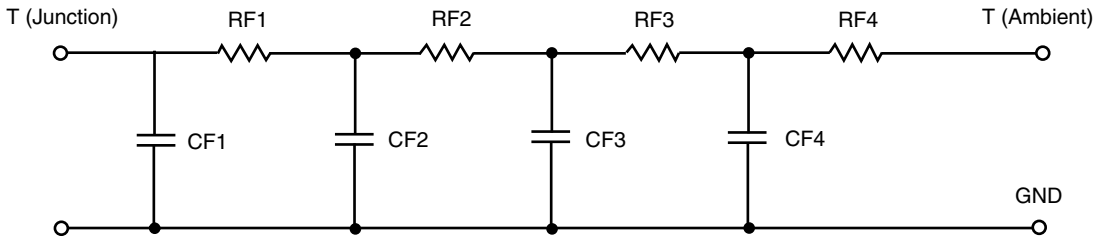


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.9721	462.2339 m	N/A
RT2	22.7617	223.4328 m	N/A
RT3	4.7559	393.5735 m	N/A
RT4	30.5510	1.5228	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	166.1764 m	800.7709 u	N/A
CT2	4.4558	120.6651 m	N/A
CT3	19.0643 m	10.4032 m	N/A
CT4	1.6930	8.6223 m	N/A

Note
N/A indicates not applicable

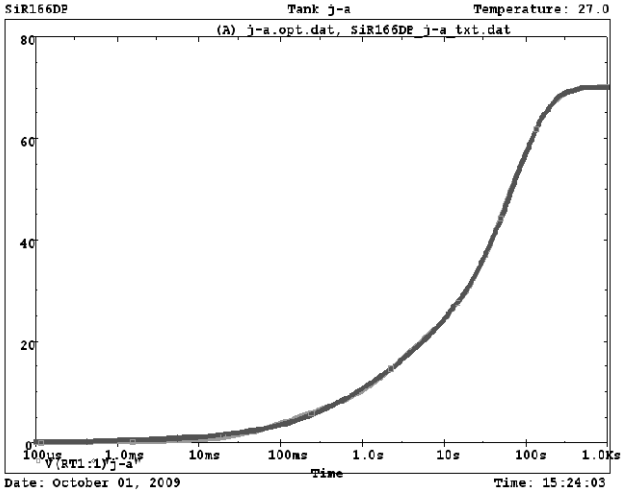
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

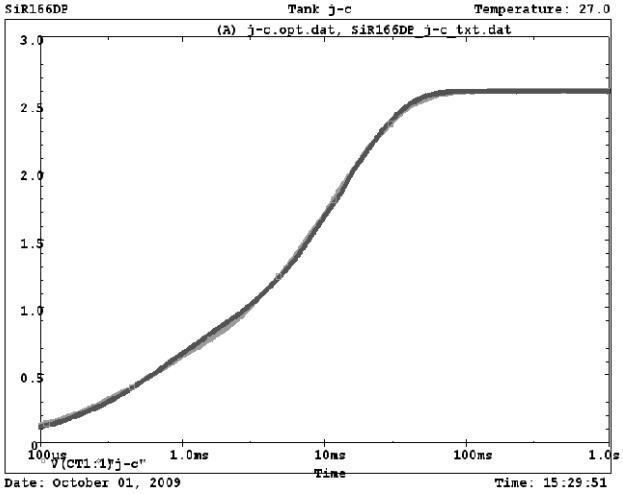
R-C THERMAL MODEL FOR FILTER CONFIGURATION

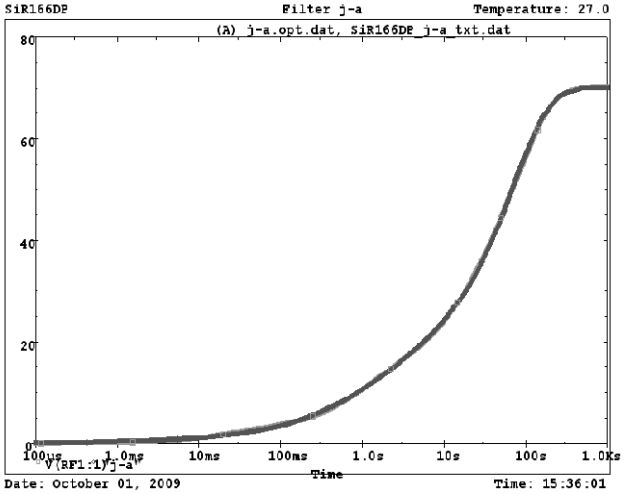


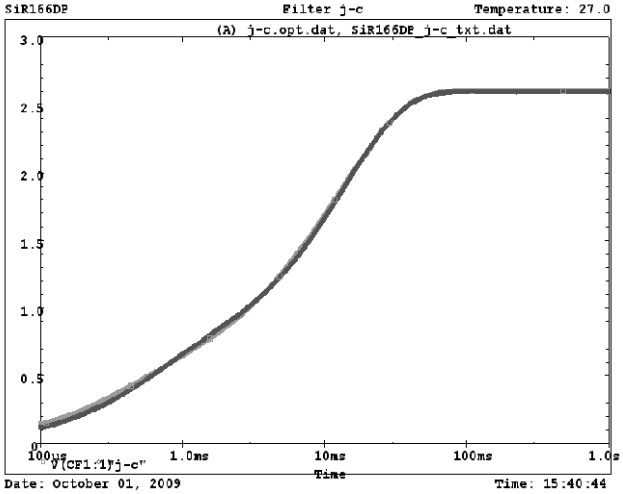
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.0817	611.9982 m	N/A
RF2	12.2141	1.0051	N/A
RF3	23.9666	945.5654 m	N/A
RF4	30.7880	40.8919 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	7.2285 m	619.7036 u	N/A
CF2	73.6831 m	3.9198 m	N/A
CF3	659.4623 m	6.6747 m	N/A
CF4	1.6559	2.6582 m	N/A

Note
N/A indicates not applicable


SiR166DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR166DP_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: October 01, 2009
Time: 15:24:03


SiR166DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR166DP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: October 01, 2009
Time: 15:29:51


SiR166DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR166DP_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: October 01, 2009
Time: 15:36:01


SiR166DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR166DP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: October 01, 2009
Time: 15:40:44