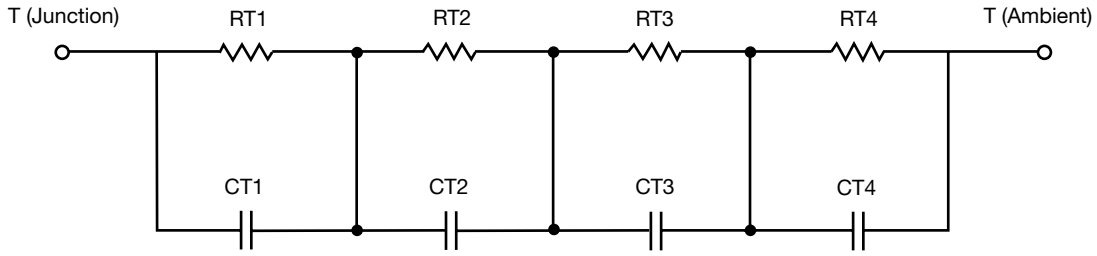
R-C Thermal Model Parameters

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

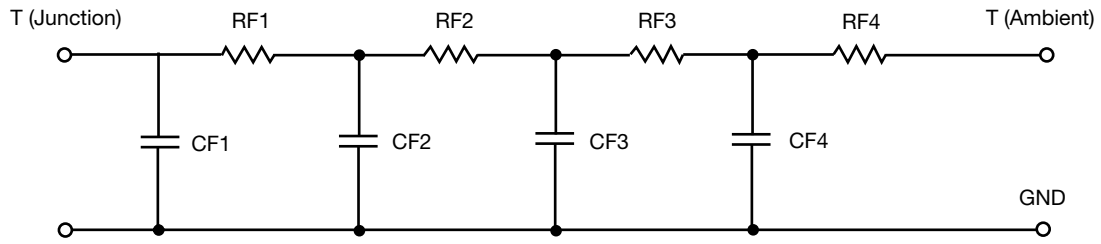


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.1530	434.7239m	N/A
RT2	30.3381	326.6422m	N/A
RT3	2.5685	313.3708m	N/A
RT4	6.9404	119.2806m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2216	188.0847m	N/A
CT2	3.6446	80.0757m	N/A
CT3	24.0109m	19.2764m	N/A
CT4	118.3612m	215.3963u	N/A

Note
N/A indicates not applicable

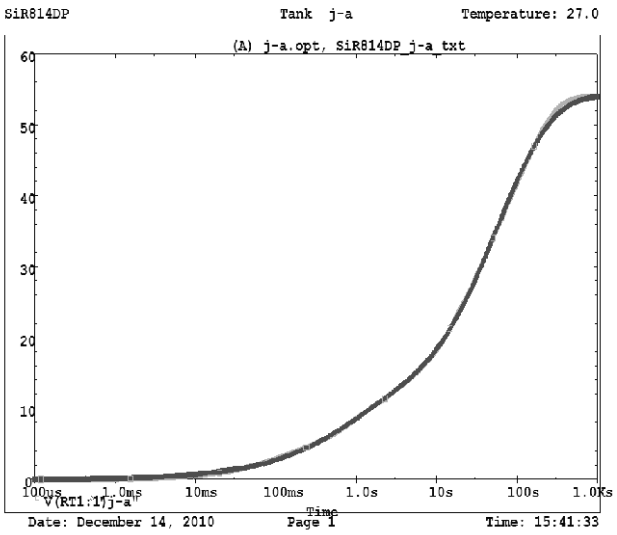
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

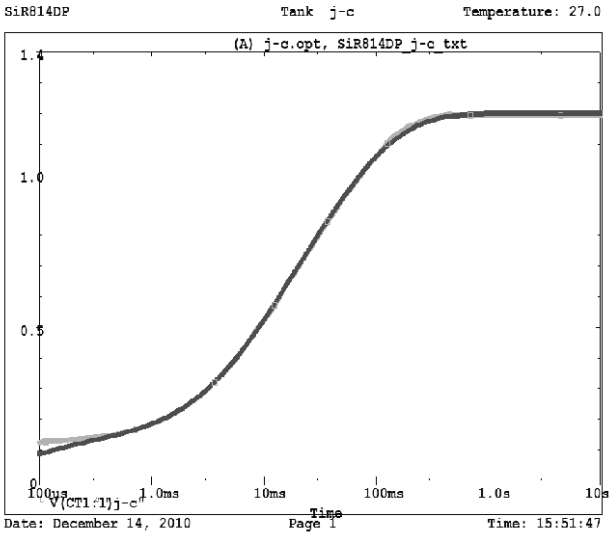
R-C THERMAL MODEL FOR FILTER CONFIGURATION

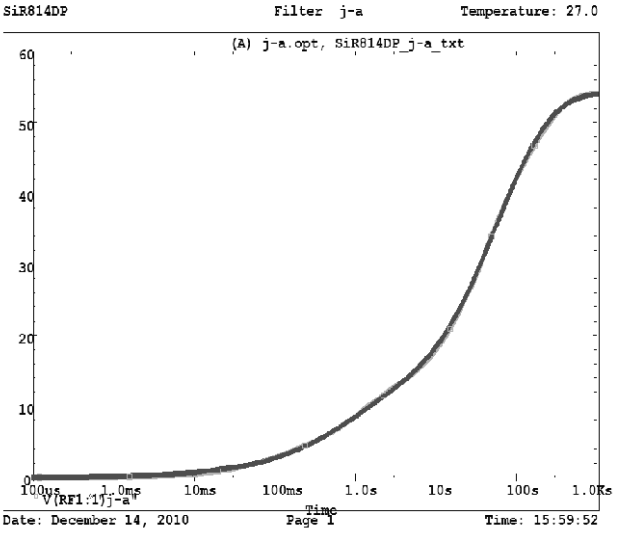


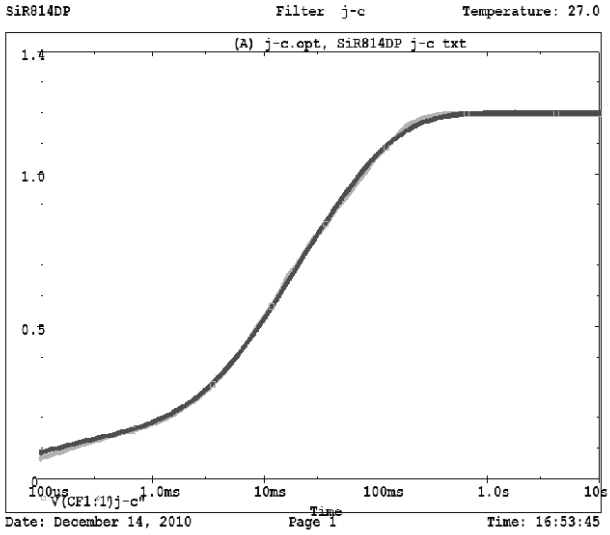
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.8432	136.0333m	N/A
RF2	8.2834	621.1130m	N/A
RF3	29.1817	255.8375m	N/A
RF4	12.8148	182.3971m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	21.0565m	1.0819m	N/A
CF2	95.9188m	14.5277m	N/A
CF3	1.1092	139.2905m	N/A
CF4	11.0065	37.6782m	N/A

Note
N/A indicates not applicable


SiR814DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR814DP_j-a_txt
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 14, 2010
Page 1
Time: 15:41:33


SiR814DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiR814DP_j-c_txt
1.4
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: December 14, 2010
Page 1
Time: 15:51:47


SiR814DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR814DP_j-a_txt
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 14, 2010
Page 1
Time: 15:59:52


SiR814DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR814DP_j-c_txt
1.4
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: December 14, 2010
Page 1
Time: 16:53:45