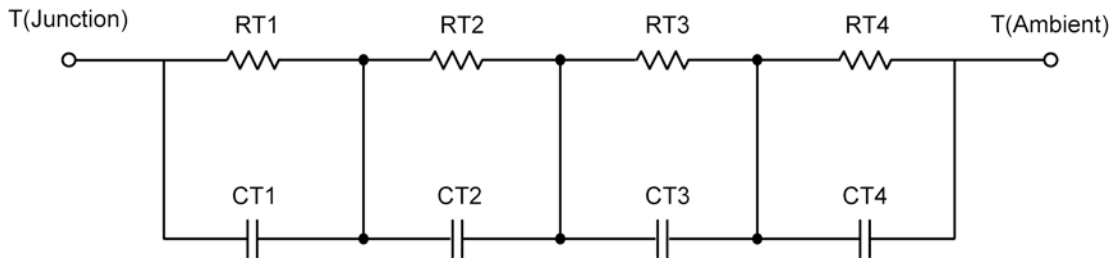
R-C Thermal Model Parameters

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."

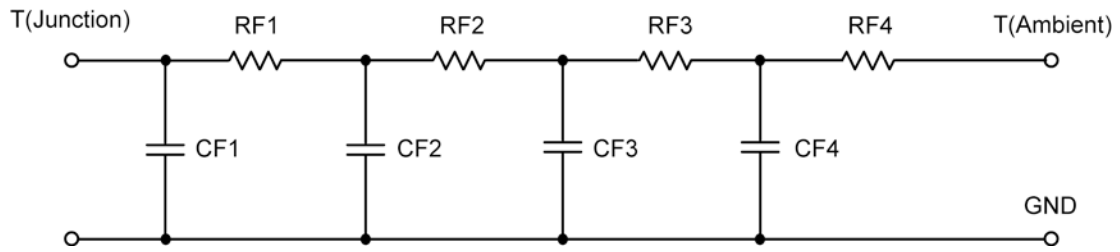
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	187.8000 m	187.3074 m	N/A
RT2	4.2652	278.7399 m	N/A
RT3	12.0824	515.2316 m	N/A
RT4	48.4646	518.7211 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	550.3966 u	29.6519 m	N/A
CT2	28.5670 m	1.8315 m	N/A
CT3	169.0130 m	36.8007 m	N/A
CT4	1.3525	36.1818 m	N/A

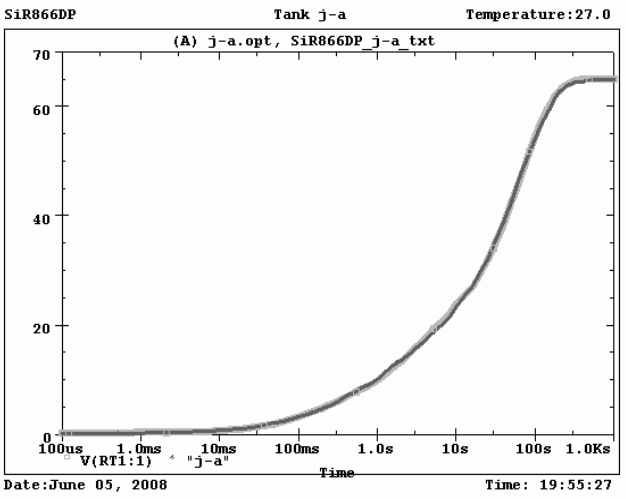
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

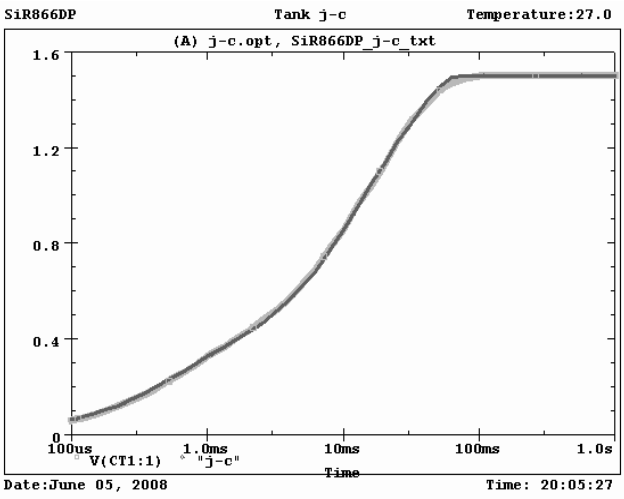
R-C THERMAL MODEL FOR FILTER CONFIGURATION

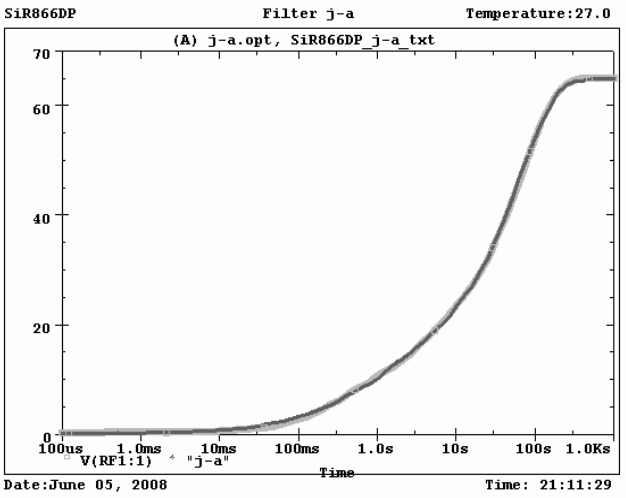


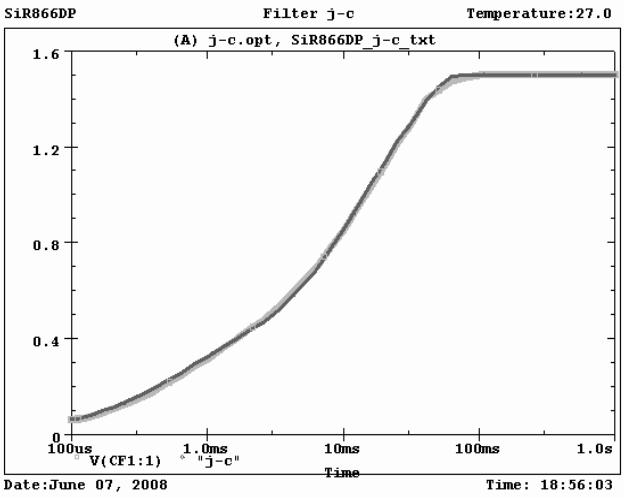
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	219.0000 m	366.7631 m	N/A
RF2	9.3477	424.4648 m	N/A
RF3	13.0204	151.2332 m	N/A
RF4	42.4129	557.5389 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	364.0140 u	1.6457 m	N/A
CF2	34.4002 m	9.2684 m	N/A
CF3	269.8512 m	1.9848 m	N/A
CF4	1.2734	13.4666 m	N/A

Note
NA indicates not applicable


SiR866DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR866DP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:June 05, 2008
Time: 19:55:27


SiR866DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR866DP_j-c_txt
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date:June 05, 2008
Time: 20:05:27


SiR866DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR866DP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:June 05, 2008
Time: 21:11:29


SiR866DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR866DP_j-c_txt
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date:June 07, 2008
Time: 18:56:03