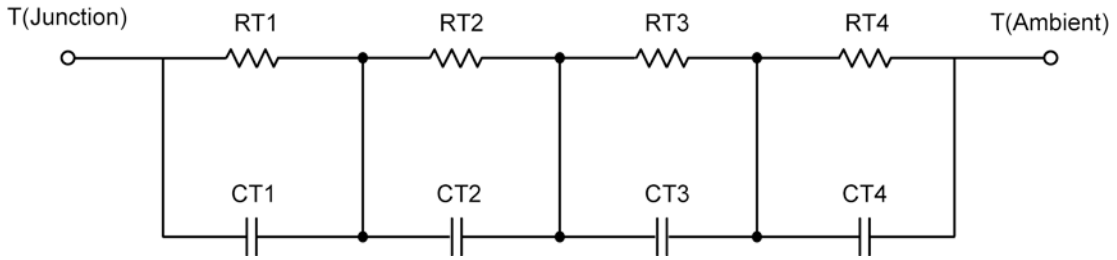
R-C Thermal Model Parameters

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."

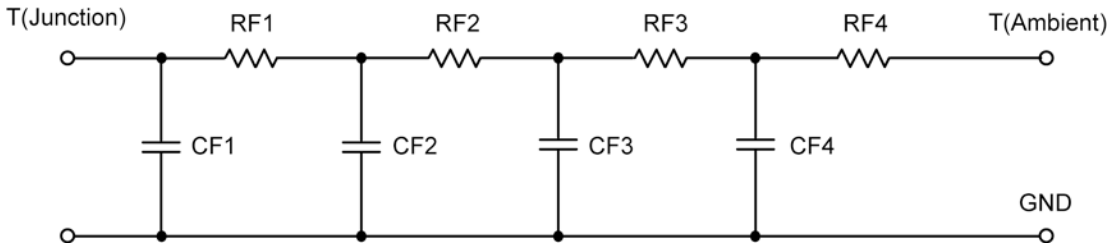
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	5.3601	79.4441 m	N/A
RT2	22.6121	450.1384 m	N/A
RT3	20.0187	104.1961 m	N/A
RT4	6.0091	566.2214 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	35.5340 m	144.7941 u	N/A
CT2	1.5011	200.3436 m	N/A
CT3	7.7177	6.5221 m	N/A
CT4	324.1614 m	25.5083 m	N/A

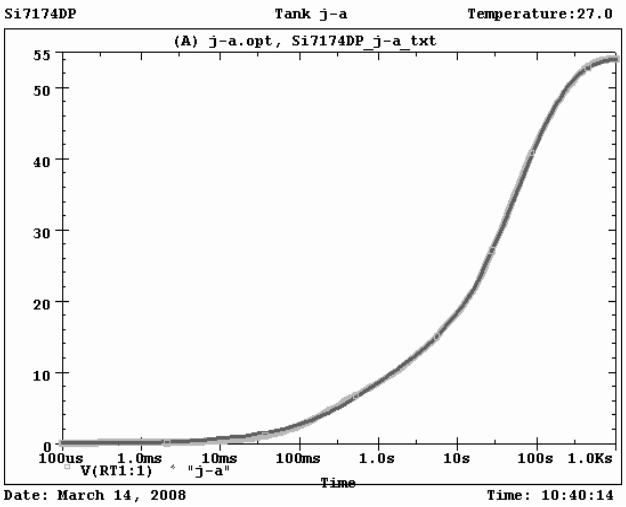
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

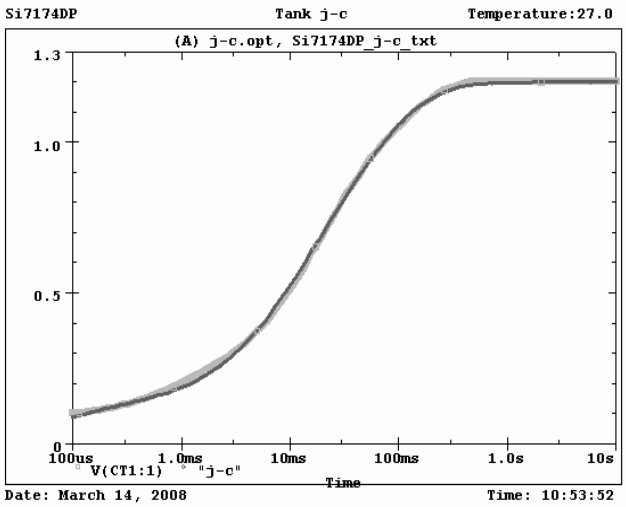
R-C THERMAL MODEL FOR FILTER CONFIGURATION

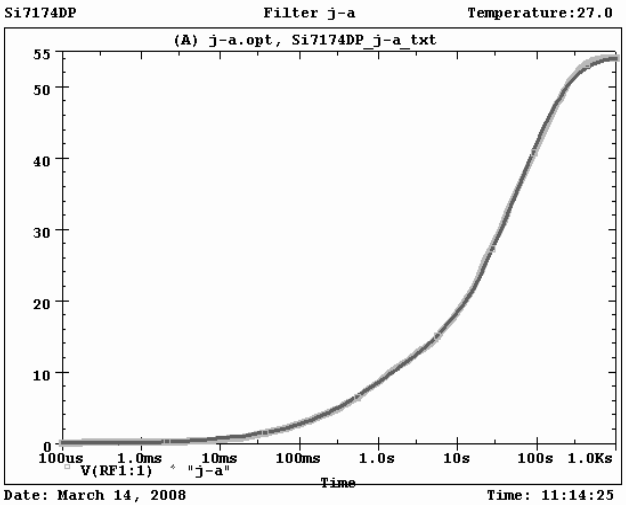


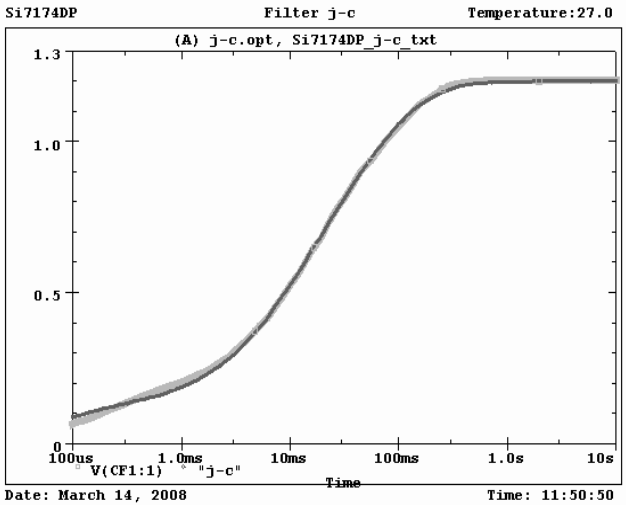
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.2943	167.8347 m	N/A
RF2	8.1467	412.4867 m	N/A
RF3	23.9672	329.2473 m	N/A
RF4	18.5918	290.4313 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	20.2731 m	1.2267 m	N/A
CF2	81.1601 m	14.9583 m	N/A
CF3	898.3513 m	26.1707 m	N/A
CF4	5.3960	240.5443 m	N/A

Note: NA indicates not applicable


Si7174DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7174DP_j-a_txt
55
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 14, 2008
Time: 10:40:14


Si7174DP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7174DP_j-c_txt
1.3
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)
"j-c"
Time
Date: March 14, 2008
Time: 10:53:52


Si7174DP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7174DP_j-a_txt
55
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 14, 2008
Time: 11:14:25


Si7174DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7174DP_j-c_txt
1.3
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-c"
Time
Date: March 14, 2008
Time: 11:50:50