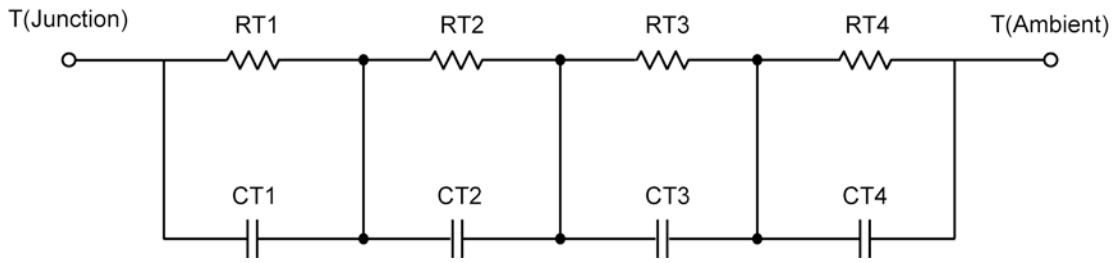
R-C Thermal Model Parameters

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."

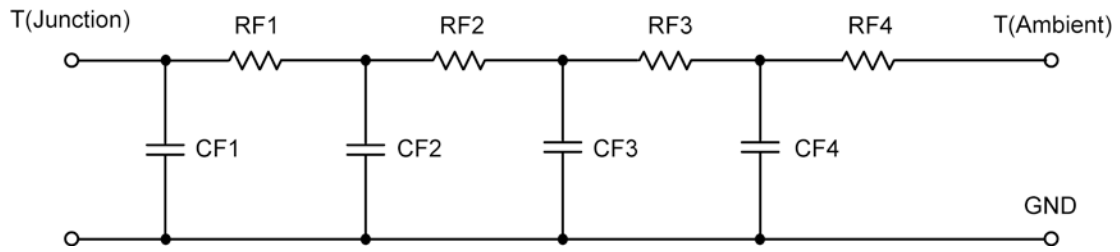
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.4464	77.9273 m	N/A
RT2	5.5426	812.7284 m	N/A
RT3	46.0367	390.6032 m	N/A
RT4	9.9743	518.7411 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	15.0926 m	70.9875 u	N/A
CT2	1.7583	20.3045 m	N/A
CT3	1.5024	10.3928 m	N/A
CT4	128.6042 m	23.8910 m	N/A

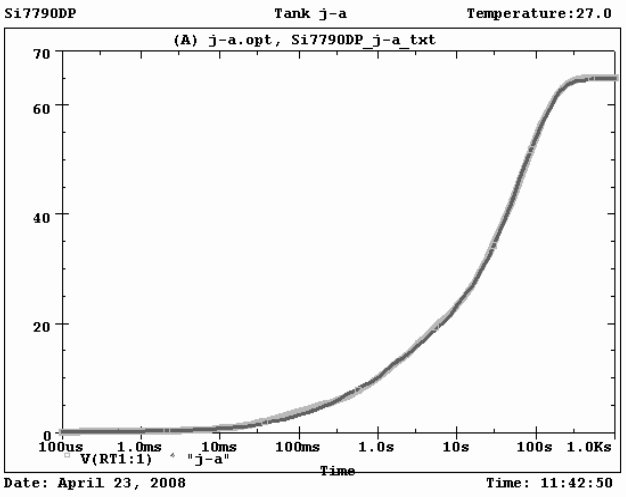
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

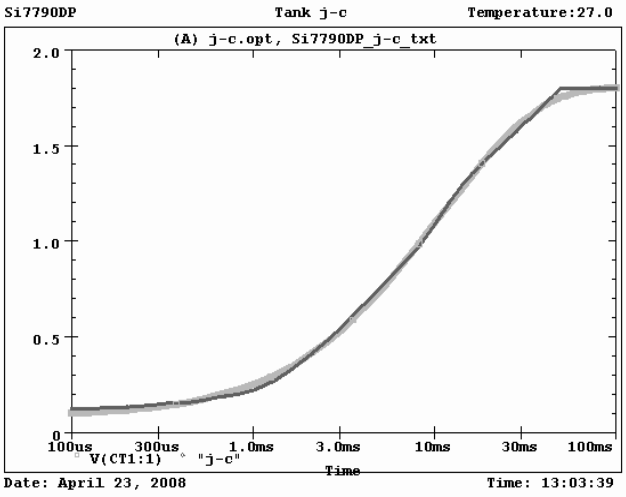
R-C THERMAL MODEL FOR FILTER CONFIGURATION

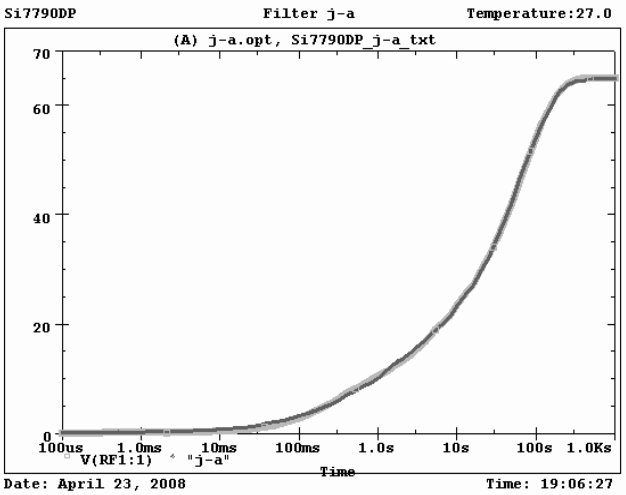


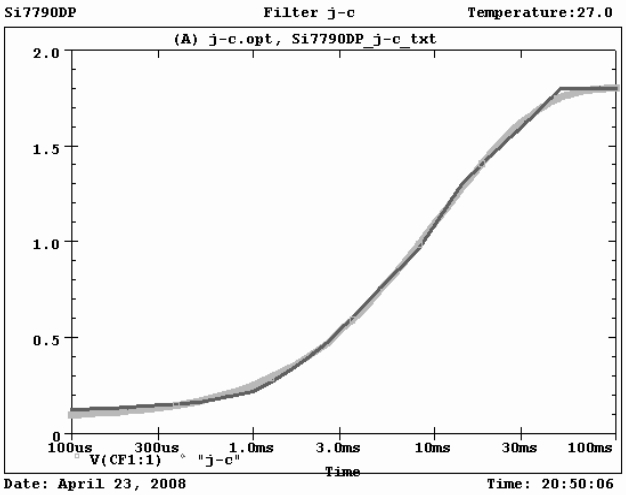
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.0582	86.1712 m	N/A
RF2	12.8680	901.5691 m	N/A
RF3	20.5808	317.2361 m	N/A
RF4	22.4930	495.0236 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	29.3756 m	331.8200 u	N/A
CF2	268.3124 m	4.9280 m	N/A
CF3	992.7173 m	1.6652 m	N/A
CF4	851.7695 m	19.3463 m	N/A

Note
NA indicates not applicable


Si7790DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7790DP_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: April 23, 2008
Time: 11:42:50


Si7790DP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7790DP_j-c_txt
2.0
1.5
1.0
0.5
0
100us
300us
1.0ms
3.0ms
10ms
30ms
100ms
V(CT1:1)
"j-c"
Time
Date: April 23, 2008
Time: 13:03:39


Si7790DP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7790DP_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: April 23, 2008
Time: 19:06:27


Si7790DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7790DP_j-c_txt
2.0
1.5
1.0
0.5
0
100us
300us
1.0ms
3.0ms
10ms
30ms
100ms
V(CF1:1)
"j-c"
Time
Date: April 23, 2008
Time: 20:50:06