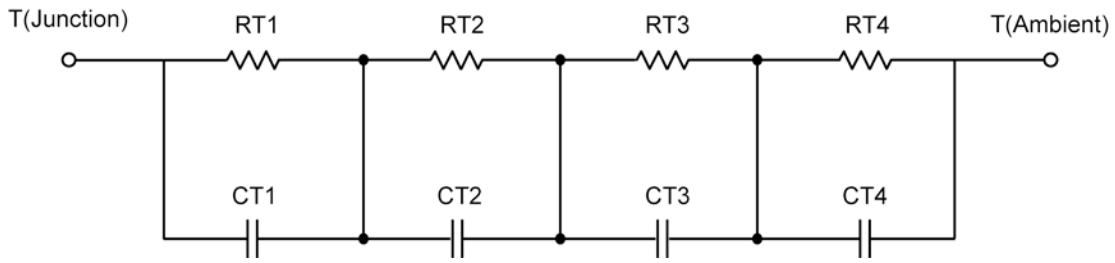
R-C Thermal Model Parameters

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."

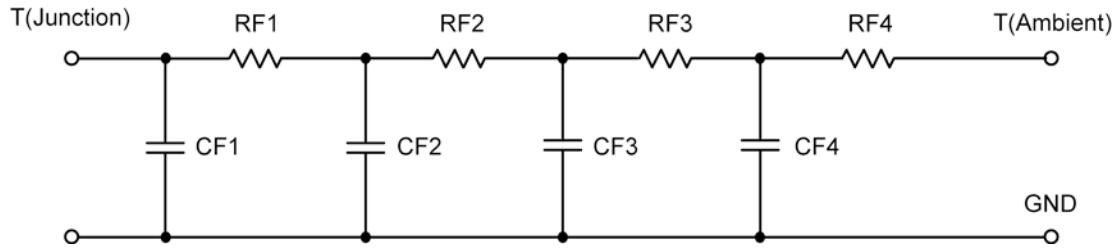
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.6691	313.7497 m	N/A
RT2	9.6873	989.3708 m	N/A
RT3	1.2814	305.3409 m	N/A
RT4	49.3622	591.5386 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	61.3086 m	987.7539 u	N/A
CT2	463.2876 m	14.0212 m	N/A
CT3	3.1110 m	4.8203 m	N/A
CT4	1.4462	24.5851 m	N/A

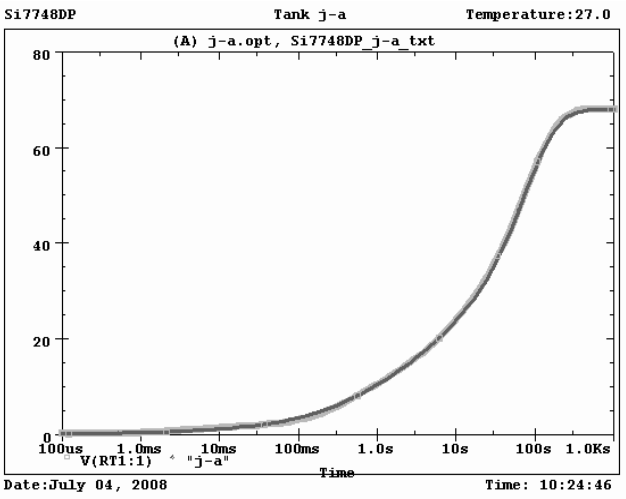
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

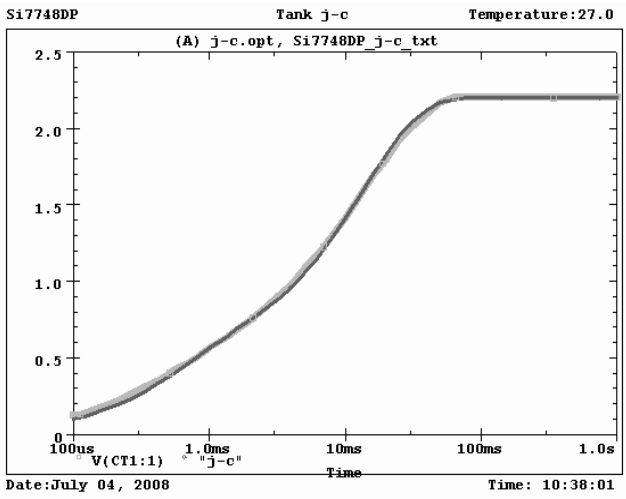
R-C THERMAL MODEL FOR FILTER CONFIGURATION

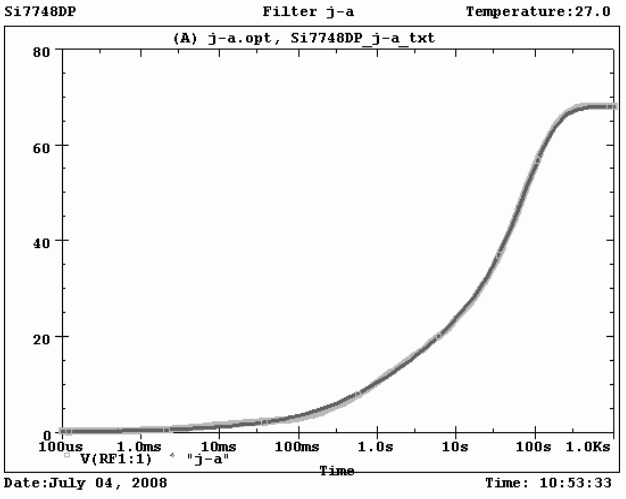


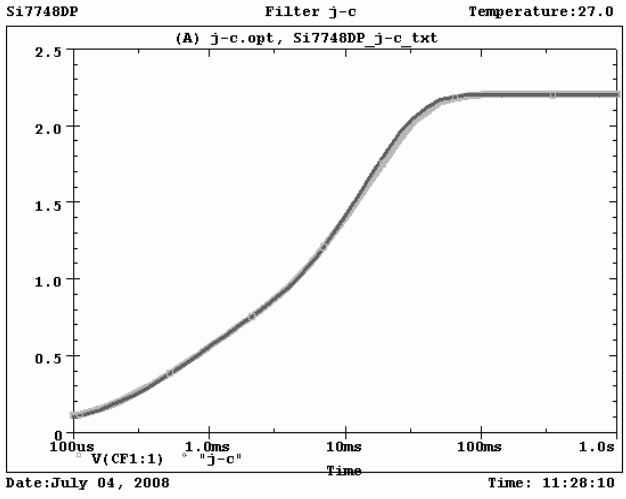
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	1.7079	634.3858 m	N/A
RF2	11.7345	660.8575 m	N/A
RF3	10.9997	304.5506 m	N/A
RF4	43.5579	600.2061 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.3514 m	890.4959 u	N/A
CF2	62.6881 m	6.0595 m	N/A
CF3	403.7794 m	1.0483 m	N/A
CF4	1.1413	11.0543 m	N/A

Note
NA indicates not applicable


Si7748DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7748DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:July 04, 2008
Time: 10:24:46


Si7748DP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7748DP_j-c_txt
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:July 04, 2008
Time: 10:38:01


Si7748DP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7748DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:July 04, 2008
Time: 10:53:33


Si7748DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7748DP_j-c_txt
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:July 04, 2008
Time: 11:28:10