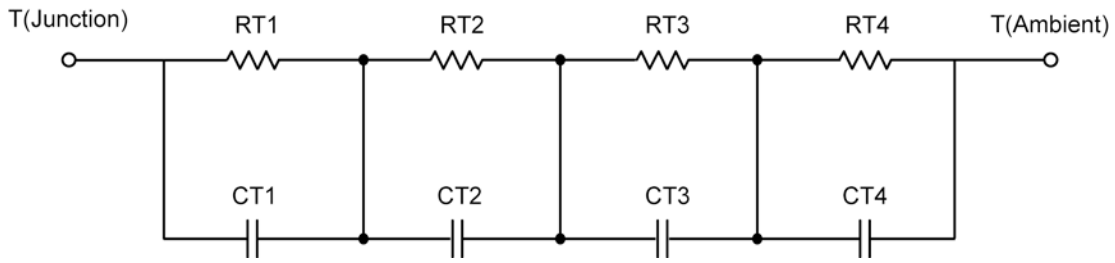
R-C Thermal Model Parameters

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."

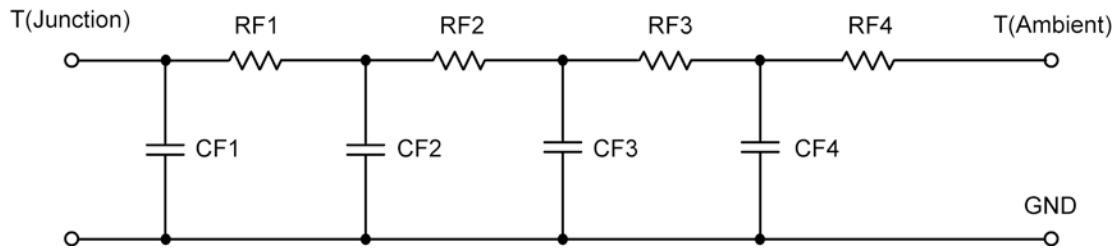
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.8421	4.4900 m	N/A
RT2	12.8017	763.6100 m	N/A
RT3	9.6767	1.5502	N/A
RT4	45.6795	1.1817	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.5639 m	5.8976 m	N/A
CT2	420.8210 m	817.8572 u	N/A
CT3	35.8721 m	13.5077 m	N/A
CT4	1.6040	11.1571 m	N/A

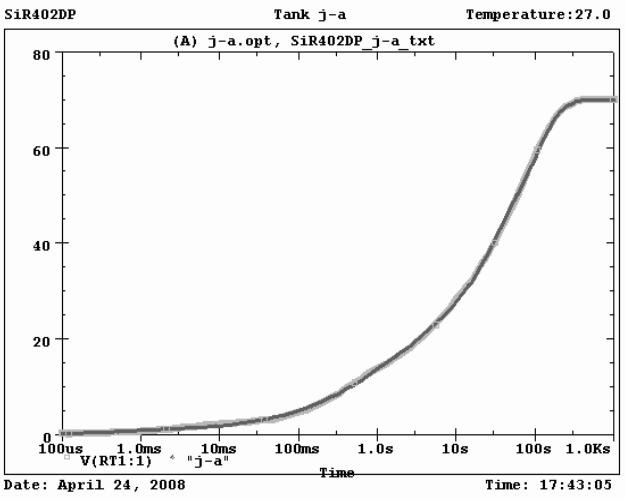
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

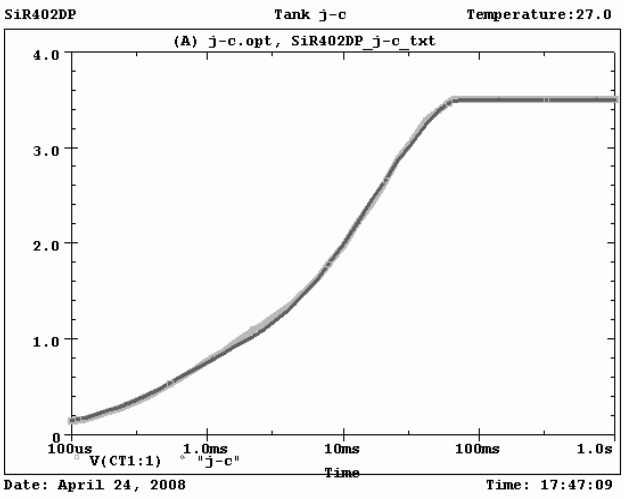
R-C THERMAL MODEL FOR FILTER CONFIGURATION

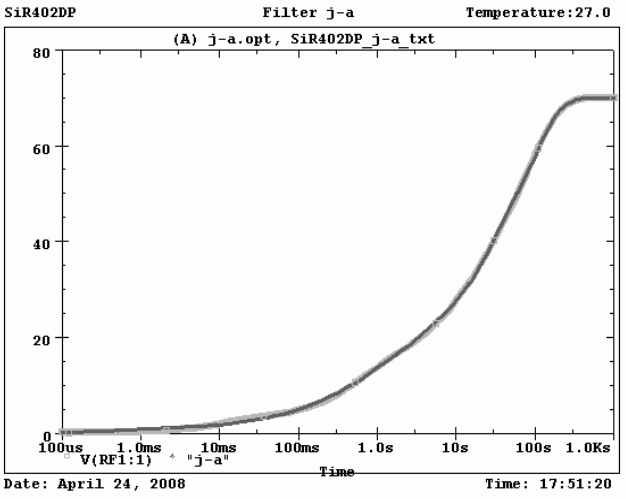


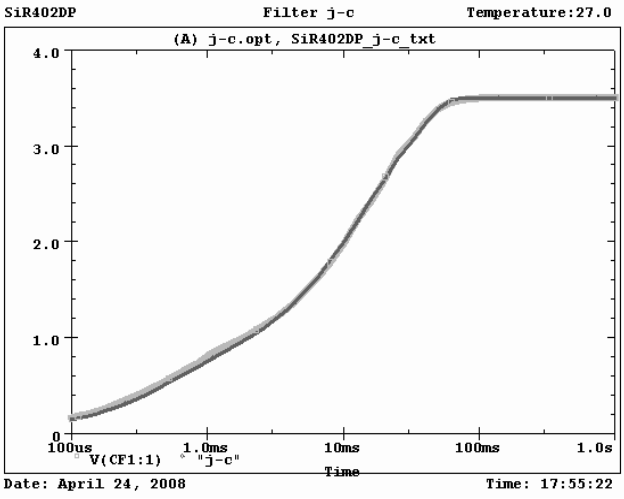
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.1831	12.9831 m	N/A
RF2	12.8594	880.7106 m	N/A
RF3	21.2722	1.6900	N/A
RF4	32.6853	916.3063 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.2541 m	85.5122 u	N/A
CF2	42.8876 m	513.3697 u	N/A
CF3	483.6856 m	5.6650 m	N/A
CF4	1.7209	367.8514 u	N/A

Note
NA indicates not applicable


SiR402DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR402DP_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: April 24, 2008
Time: 17:43:05


SiR402DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR402DP_j-c_txt
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: April 24, 2008
Time: 17:47:09


SiR402DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR402DP_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: April 24, 2008
Time: 17:51:20


SiR402DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR402DP_j-c_txt
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: April 24, 2008
Time: 17:55:22