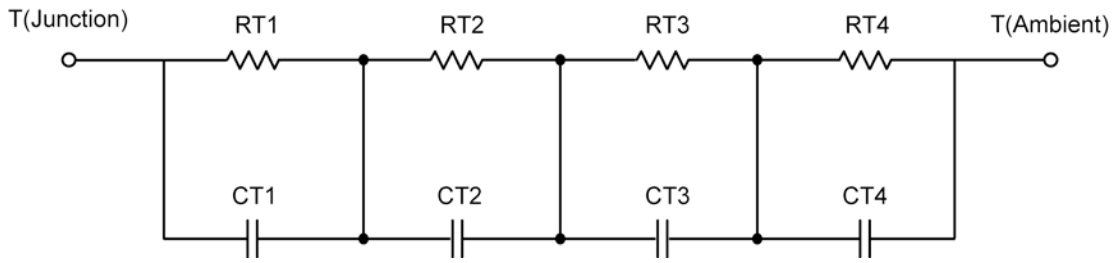
R-C Thermal Model Parameters

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."

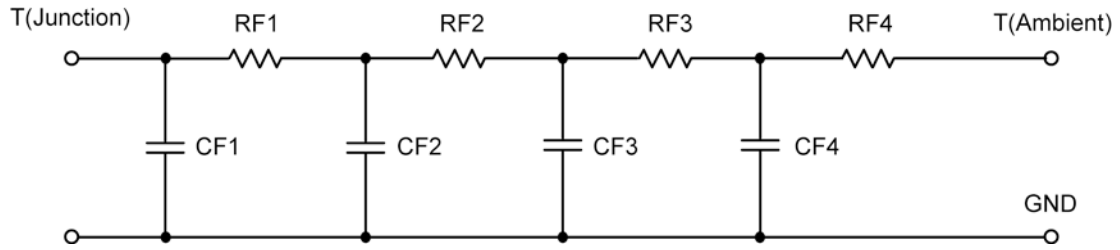
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.9667	213.2987 m	N/A
RT2	10.3196	244.8663 m	N/A
RT3	8.3294	873.9002 m	N/A
RT4	44.3843	967.9348 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.1756 m	1.2460 m	N/A
CT2	862.7791 m	2.4651 m	N/A
CT3	78.2393 m	9.0575 m	N/A
CT4	1.7922	17.9119 m	N/A

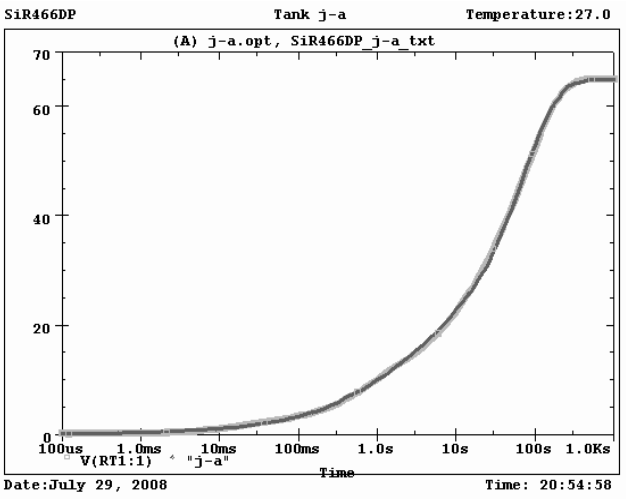
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

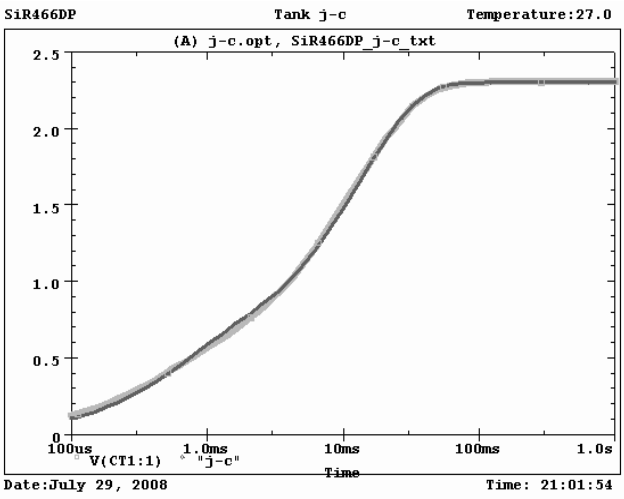
R-C THERMAL MODEL FOR FILTER CONFIGURATION

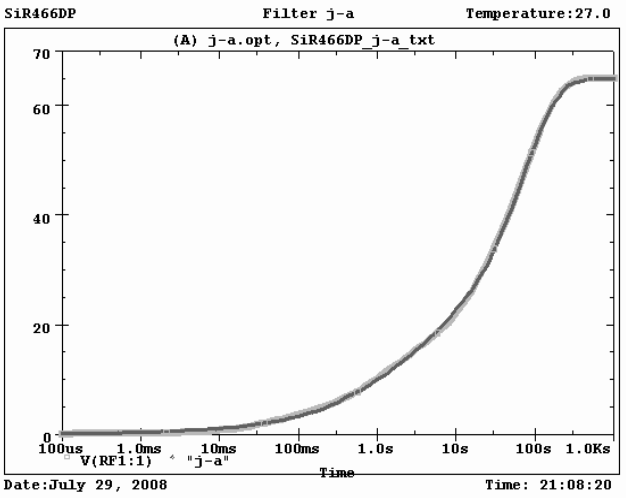


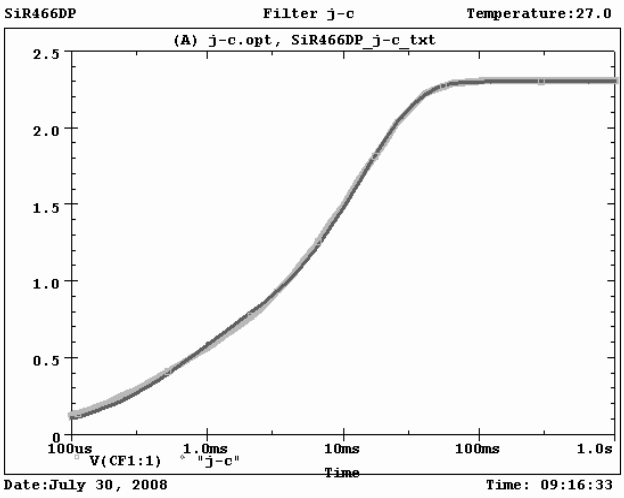
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.8804	528.7994 m	N/A
RF2	10.4091	894.2351 m	N/A
RF3	19.6239	832.3065 m	N/A
RF4	31.0866	44.6590 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	13.0526 m	715.9232 u	N/A
CF2	78.5055 m	4.1535 m	N/A
CF3	718.0263 m	8.4269 m	N/A
CF4	1.3336	3.1320 m	N/A

Note
NA indicates not applicable


SiR466DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR466DP_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:July 29, 2008
Time: 20:54:58


SiR466DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR466DP_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 29, 2008
Time: 21:01:54


SiR466DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR466DP_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:July 29, 2008
Time: 21:08:20


SiR466DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR466DP_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 30, 2008
Time: 09:16:33