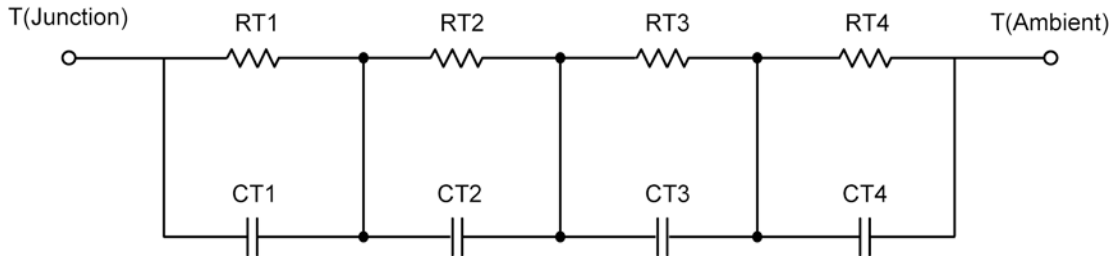
R-C Thermal Model Parameters

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."

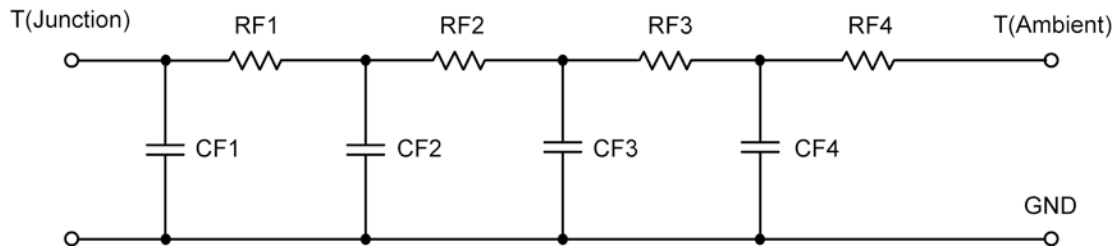
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	44.1392	503.4000 m	N/A
RT2	10.6947	1.4502	N/A
RT3	11.5949	50.3000 m	N/A
RT4	3.5712	496.1000 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.8399	903.2755 u	N/A
CT2	2.2986	11.1911 m	N/A
CT3	120.8597 m	635.5341 m	N/A
CT4	14.3351 m	9.9311 m	N/A

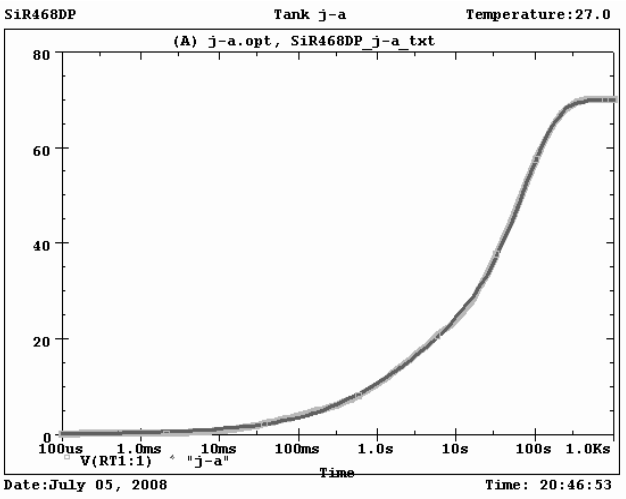
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

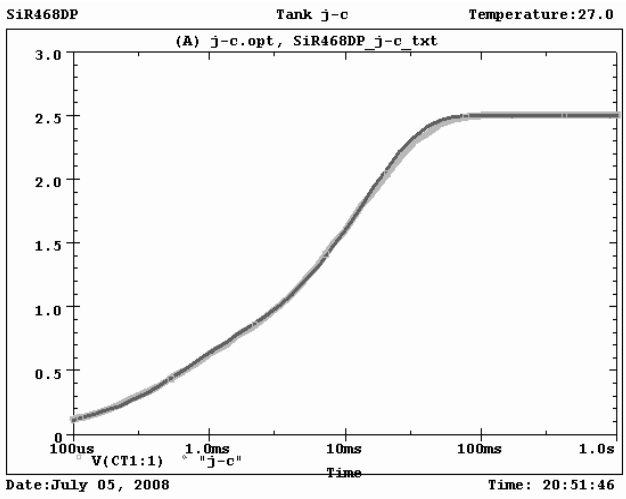
R-C THERMAL MODEL FOR FILTER CONFIGURATION

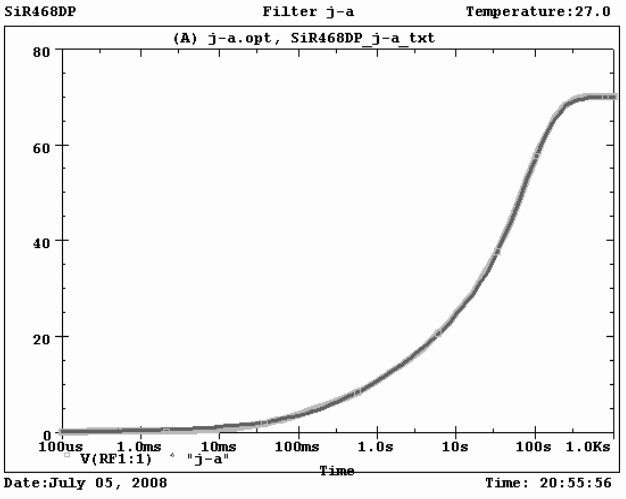


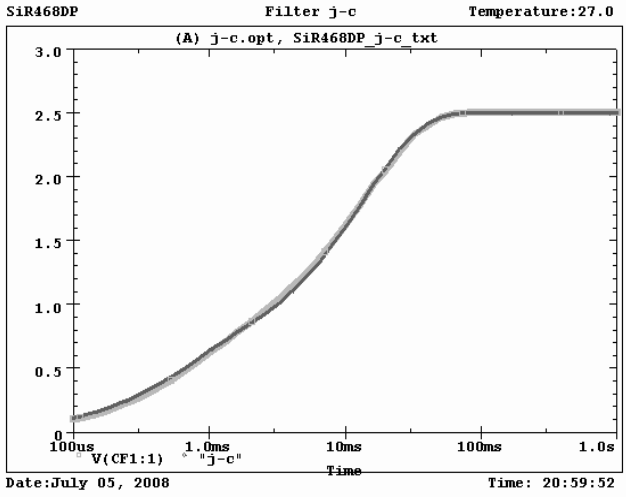
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.0575	830.9496 m	N/A
RF2	8.9427	1.0946	N/A
RF3	14.6554	570.4218 m	N/A
RF4	41.3444	4.0286 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	15.7525 m	935.8087 u	N/A
CF2	82.3123 m	6.3024 m	N/A
CF3	379.8746 m	5.7626 m	N/A
CF4	1.2559	29.1935 m	N/A

Note
NA indicates not applicable


SiR468DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR468DP_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 05, 2008
Time: 20:46:53


SiR468DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR468DP_j-c_txt
3.0
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 05, 2008
Time: 20:51:46


SiR468DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR468DP_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 05, 2008
Time: 20:55:56


SiR468DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR468DP_j-c_txt
3.0
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 05, 2008
Time: 20:59:52