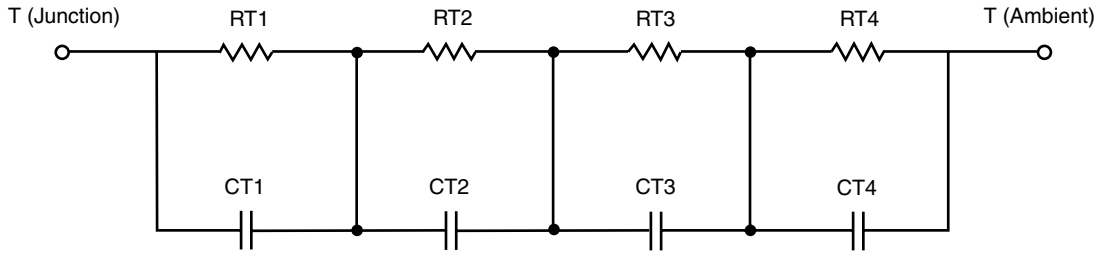
R-C Thermal Model Parameters

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

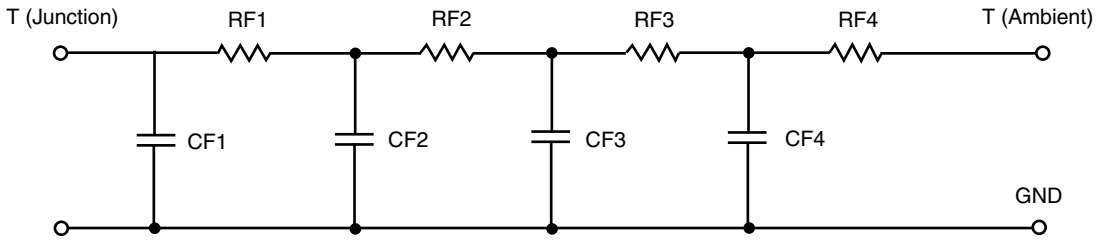


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.2124	593.9216 m	N/A
RT2	48.2543	78.2574 m	N/A
RT3	5.1614	832.3738 m	N/A
RT4	10.3719	295.4472 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.2562 m	16.9837 m	N/A
CT2	1.3700	442.3997 u	N/A
CT3	61.9733 m	20.8255 m	N/A
CT4	227.0269 m	12.6873 m	N/A

Note
N/A indicates not applicable

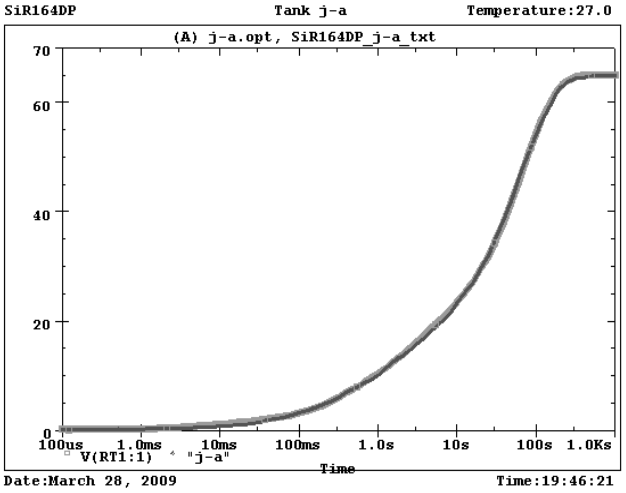
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

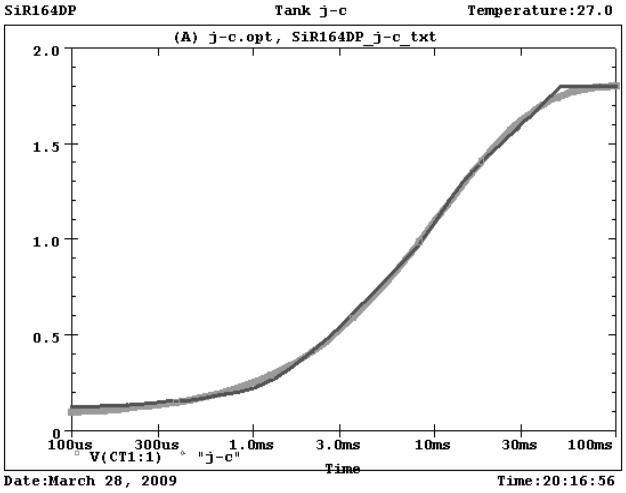
R-C THERMAL MODEL FOR FILTER CONFIGURATION

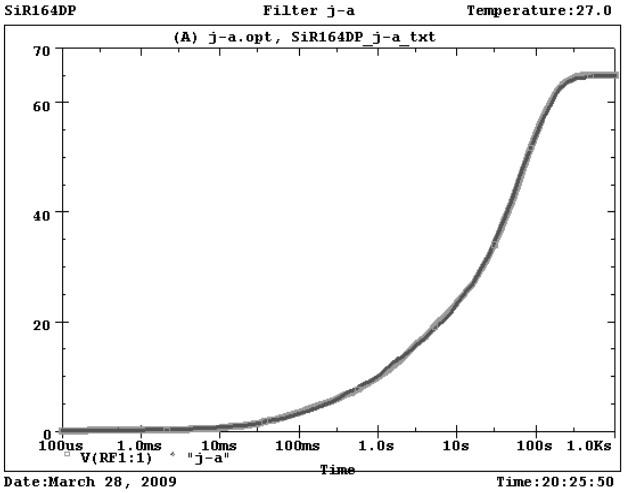


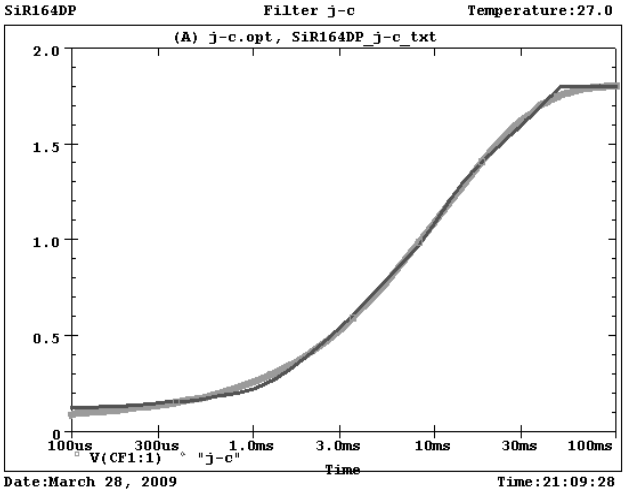
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.9027	94.8036 m	N/A
RF2	8.3683	555.5405 m	N/A
RF3	8.1311	686.5101 m	N/A
RF4	43.5979	463.1458 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	17.3488 m	533.2179 u	N/A
CF2	105.9253 m	4.4159 m	N/A
CF3	174.5293 m	1.8762 m	N/A
CF4	1.2166	20.2832 m	N/A

Note
N/A indicates not applicable


SiR164DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR164DP_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:March 28, 2009
Time:19:46:21


SiR164DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR164DP_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:March 28, 2009
Time:20:16:56


SiR164DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR164DP_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:March 28, 2009
Time:20:25:50


SiR164DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR164DP_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:March 28, 2009
Time:21:09:28