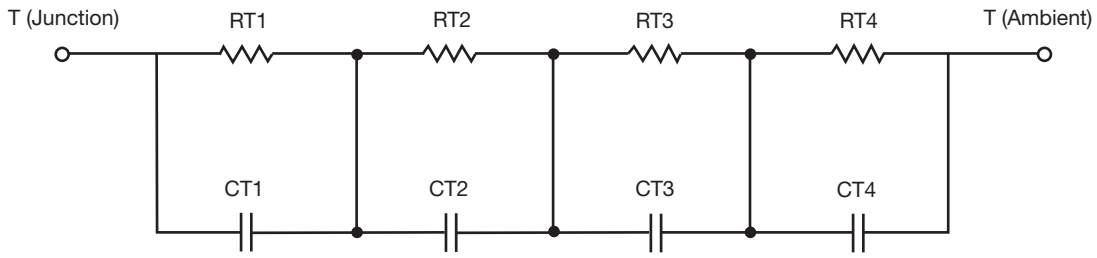
R-C Thermal Model Parameters

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

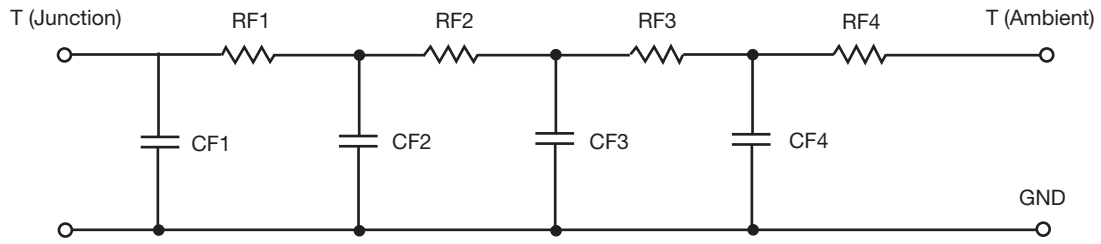


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	25.1644	764.7855m	N/A
RT2	24.4156	434.4741m	N/A
RT3	11.0218	714.7296m	N/A
RT4	4.3811	390.6925m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.9576	8.7311m	N/A
CT2	3.9347	891.3890u	N/A
CT3	175.2650m	25.5097m	N/A
CT4	20.6556m	41.7023m	N/A

Note
N/A indicates not applicable

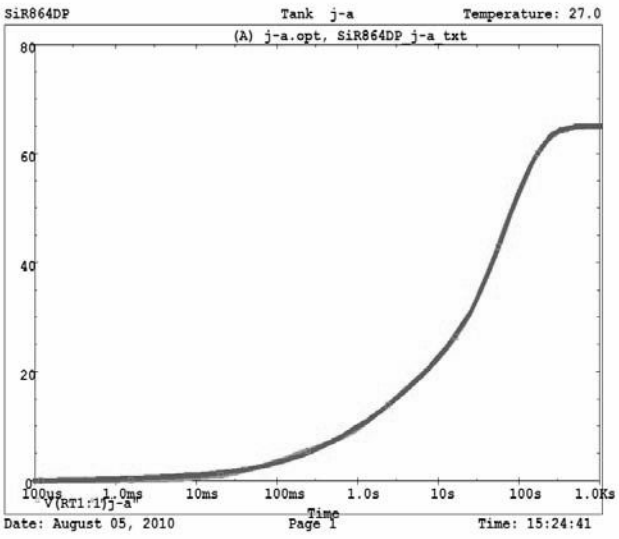
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

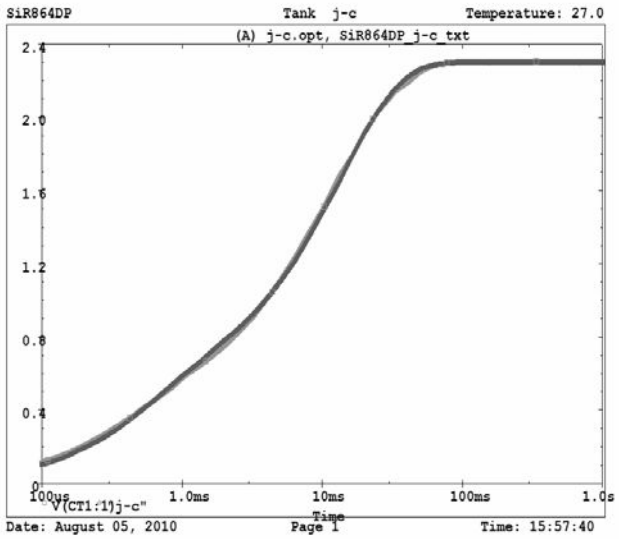
R-C THERMAL MODEL FOR FILTER CONFIGURATION

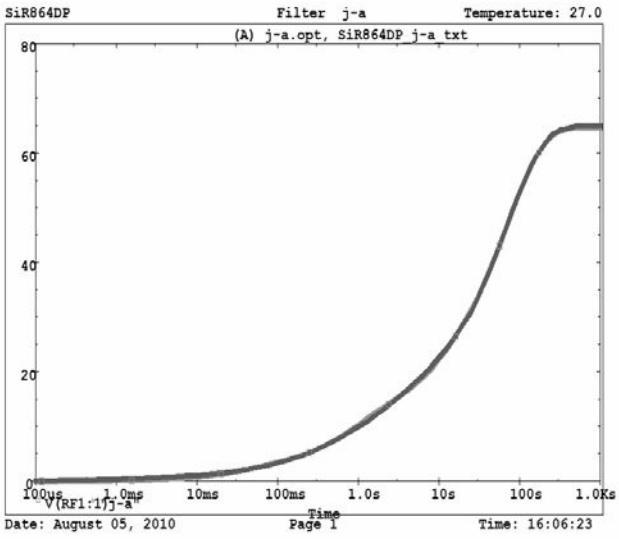


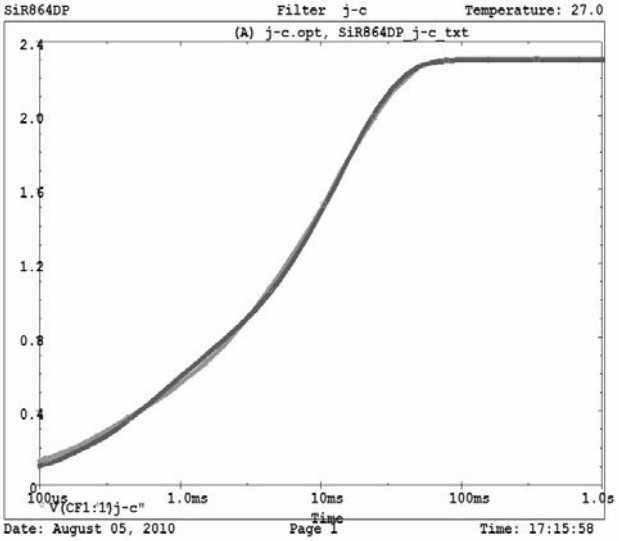
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.3758	441.0559m	N/A
RF2	10.0283	733.3721m	N/A
RF3	17.8556	878.3204m	N/A
RF4	33.3565	248.4618m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	12.8818m	664.3432u	N/A
CF2	66.6348m	2.9348m	N/A
CF3	626.6218m	7.0733m	N/A
CF4	1.3717	17.3363m	N/A

Note
N/A indicates not applicable


SiR864DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR864DP_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: August 05, 2010
Page 1
Time: 15:24:41


SiR864DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiR864DP_j-c_txt
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: August 05, 2010
Page 1
Time: 15:57:40


SiR864DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR864DP_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: August 05, 2010
Page 1
Time: 16:06:23


SiR864DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR864DP_j-c_txt
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: August 05, 2010
Page 1
Time: 17:15:58