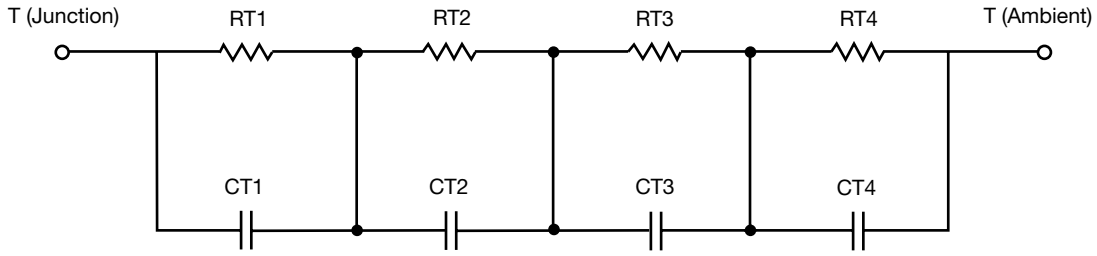
R-C Thermal Model Parameters

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



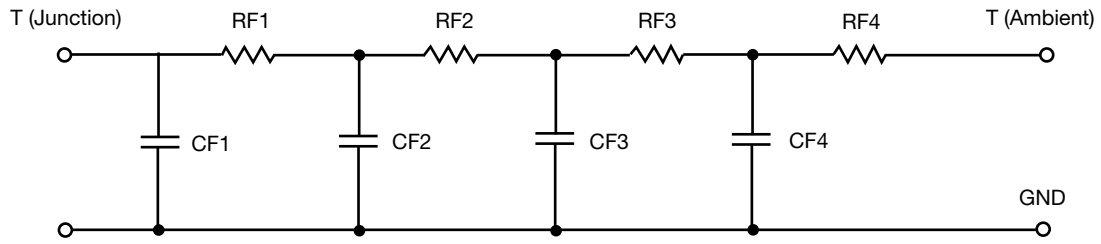
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.0885	1.9005	N/A
RT2	7.9789	864.2827 m	N/A
RT3	12.1571	436.9764 m	N/A
RT4	60.7755	998.2399 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.6930 m	764.7782 u	N/A
CT2	26.0948 m	49.6821 m	N/A
CT3	127.3571 m	9.8484	N/A
CT4	1.0056	9.6842 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.

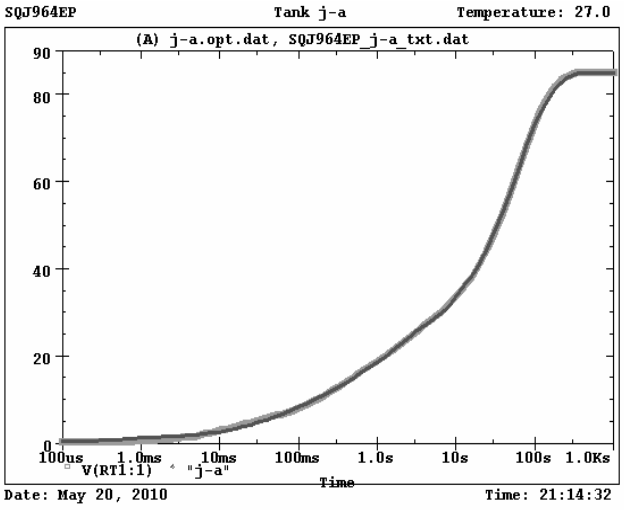
R-C THERMAL MODEL FOR FILTER CONFIGURATION

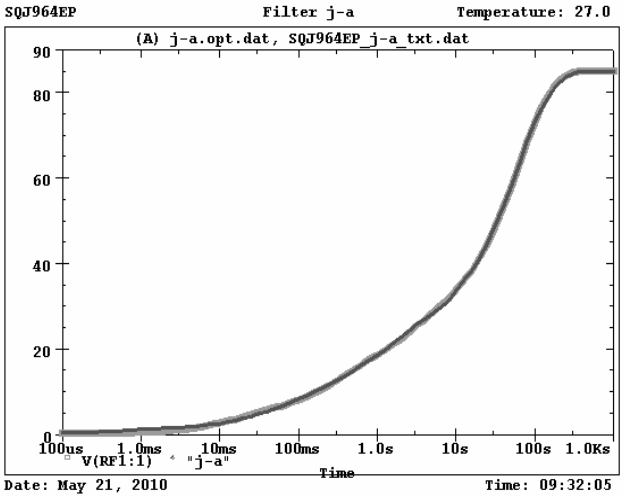


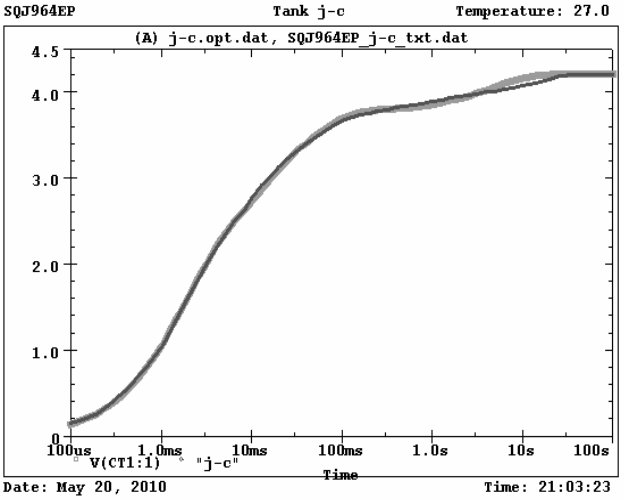
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.4980	1.6388	N/A
RF2	11.2297	1.1199	N/A
RF3	13.0829	992.9340 m	N/A
RF4	55.1894	430.8350 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.6780 m	643.9319 u	N/A
CF2	22.1709 m	1.5952 m	N/A
CF3	166.4422 m	29.4975 m	N/A
CF4	930.2138 m	10.3692	N/A

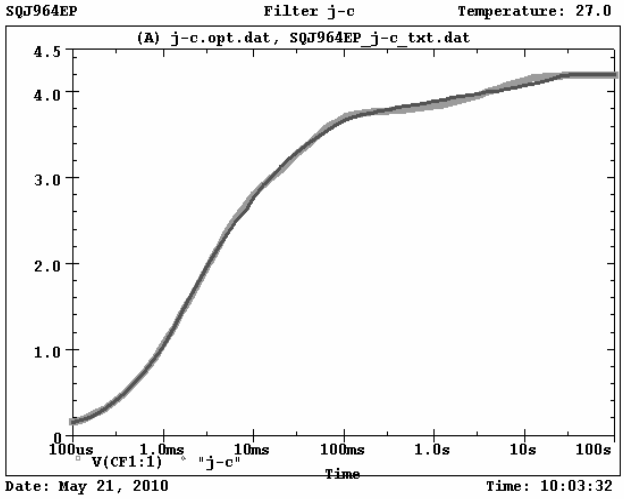
Note

- N/A indicates not applicable


SQJ964EP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ964EP_j-a_txt.dat
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: May 20, 2010
Time: 21:14:32


SQJ964EP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ964EP_j-a_txt.dat
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: May 21, 2010
Time: 09:32:05


SQJ964EP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ964EP_j-c_txt.dat
4.5
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-c"
Time
Date: May 20, 2010
Time: 21:03:23


SQJ964EP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ964EP_j-c_txt.dat
4.5
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-c"
Time
Date: May 21, 2010
Time: 10:03:32