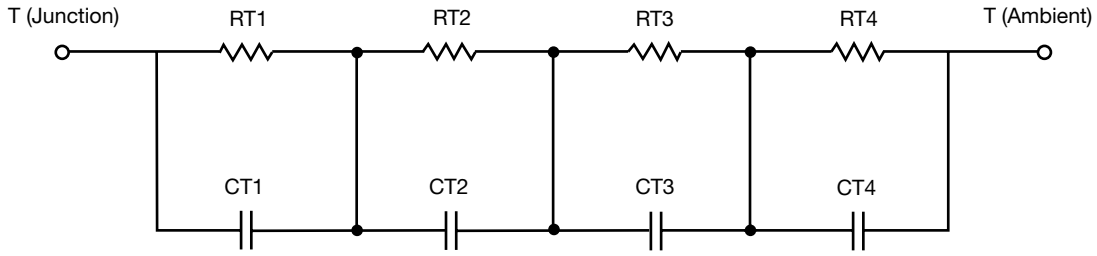
R-C Thermal Model Parameters

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

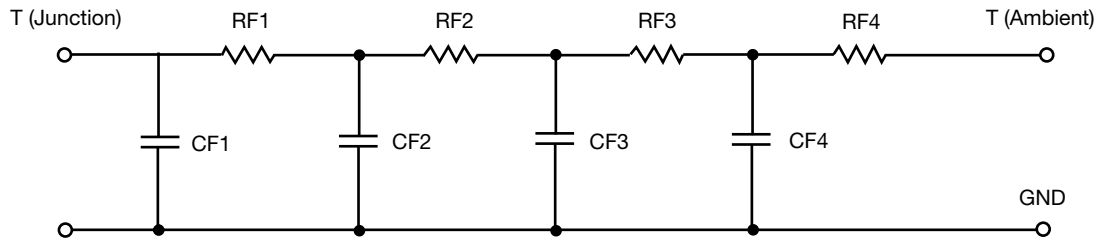


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.7116	1.2297	N/A
RT2	60.2713	384.9000m	N/A
RT3	7.4496	1.4275	N/A
RT4	8.3070	1.2579	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	93.2808m	900.6096u	N/A
CT2	1.0188	18.4911	N/A
CT3	276.0689m	2.7492m	N/A
CT4	4.9576m	30.0830m	N/A

Note
N/A indicates not applicable

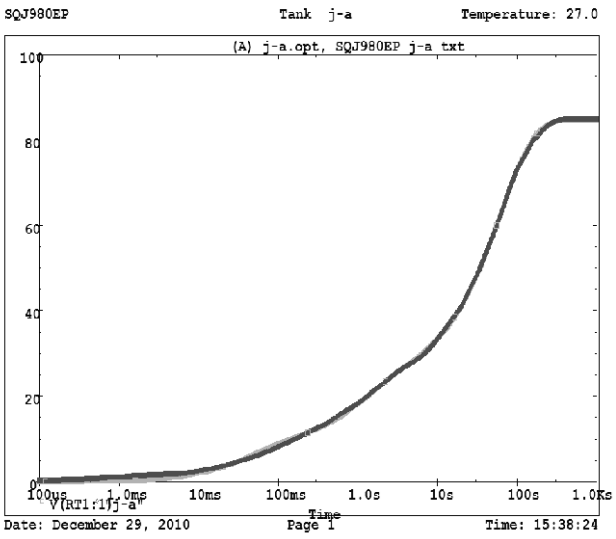
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

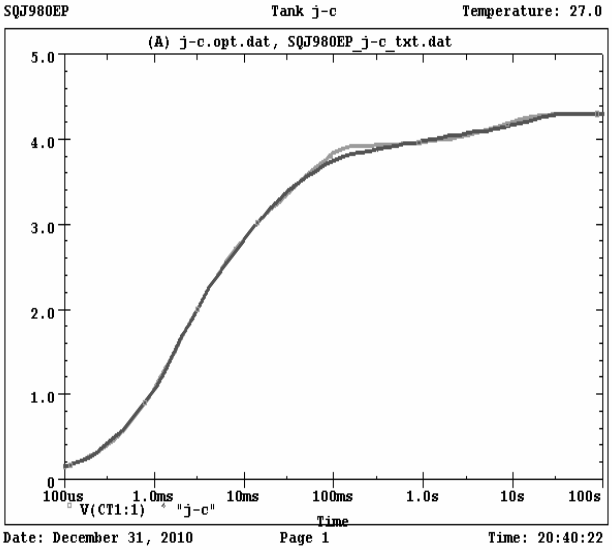
R-C THERMAL MODEL FOR FILTER CONFIGURATION

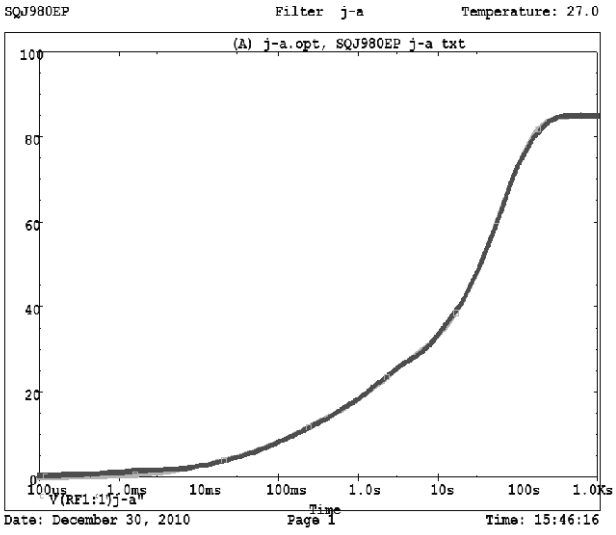


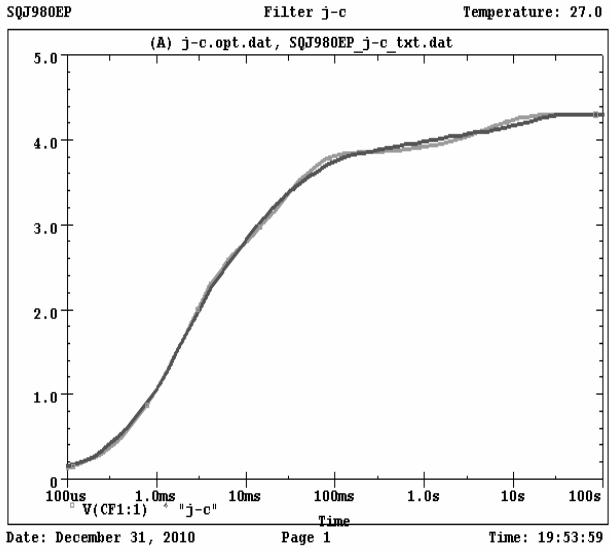
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.6714	723.8823m	N/A
RF2	8.3303	1.7902	N/A
RF3	14.1406	1.3244	N/A
RF4	57.5739	461.5177m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.7751m	713.5464u	N/A
CF2	12.5679m	34.6136u	N/A
CF3	91.9229m	18.5351m	N/A
CF4	934.3732m	10.7999	N/A

Note
N/A indicates not applicable


SQJ980EP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQJ980EP_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a"
Time
Date: December 29, 2010
Page 1
Time: 15:38:24


SQJ980EP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ980EP_j-c_txt.dat
5.0
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: December 31, 2010
Page 1
Time: 20:40:22


SQJ980EP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQJ980EP_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a"
Time
Date: December 30, 2010
Page 1
Time: 15:46:16


SQJ980EP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ980EP_j-c_txt.dat
5.0
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: December 31, 2010
Page 1
Time: 19:53:59