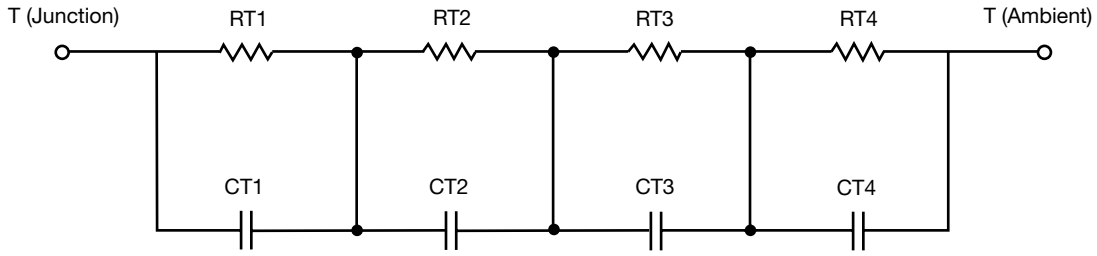
R-C Thermal Model Parameters

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

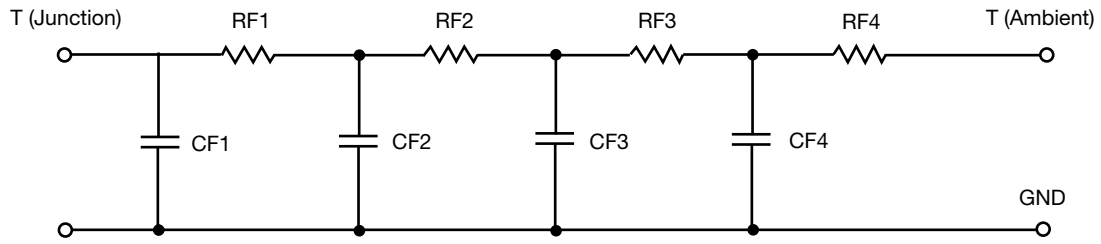


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.7216	10.4338 m	N/A
RT2	13.9406	1.0604	N/A
RT3	5.4544	1.2916	N/A
RT4	57.4794	337.6106 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	19.5135 m	3.2949 u	N/A
CT2	125.5090 m	14.2291 m	N/A
CT3	1.2731 m	121.8046 m	N/A
CT4	1.1927	5.2986 m	N/A

Note
N/A indicates not applicable

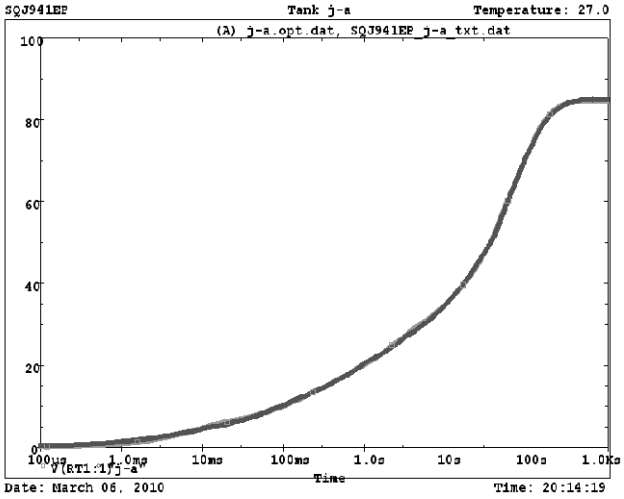
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

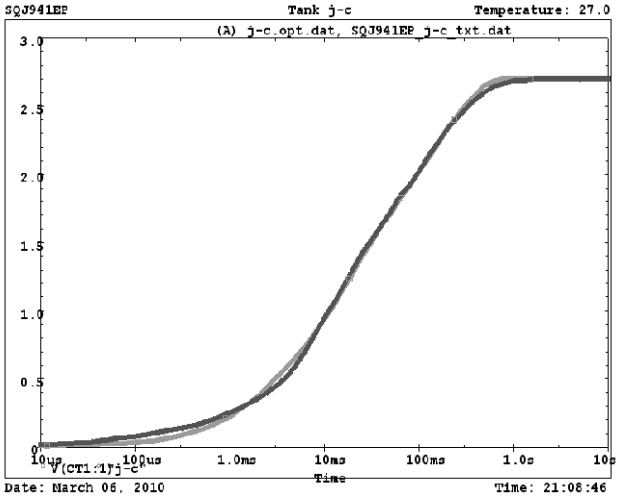
R-C THERMAL MODEL FOR FILTER CONFIGURATION

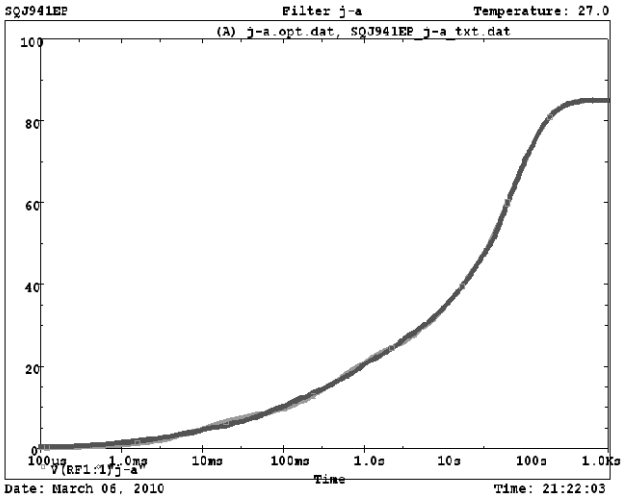


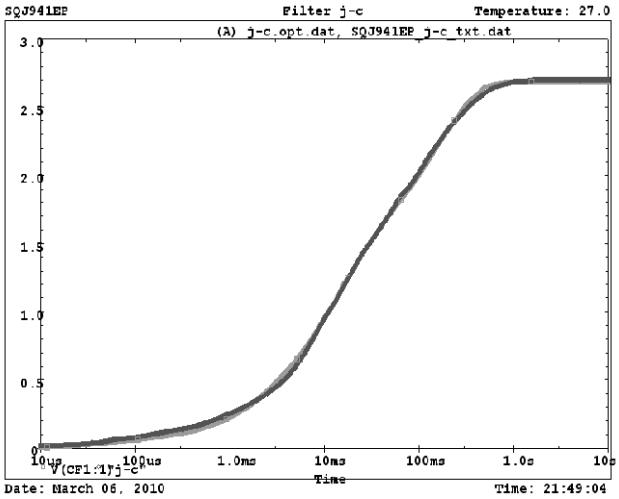
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.2199	74.8235 m	N/A
RF2	14.8045	681.7873 m	N/A
RF3	18.2829	855.4877 m	N/A
RF4	44.5589	1.0724	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.2613 m	876.8995 u	N/A
CF2	28.7179 m	4.2719 m	N/A
CF3	437.2504 m	8.9976 m	N/A
CF4	1.1212	123.1443 m	N/A

Note
N/A indicates not applicable


SQJ941EP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ941EP_j-a_txt.dat
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)/j-a
Time
Date: March 06, 2010
Time: 20:14:19


SQJ941EP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ941EP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)/j-c
Time
Date: March 06, 2010
Time: 21:08:46


SQJ941EP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ941EP_j-a_txt.dat
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a
Time
Date: March 06, 2010
Time: 21:22:03


SQJ941EP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ941EP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)/j-c
Time
Date: March 06, 2010
Time: 21:49:04