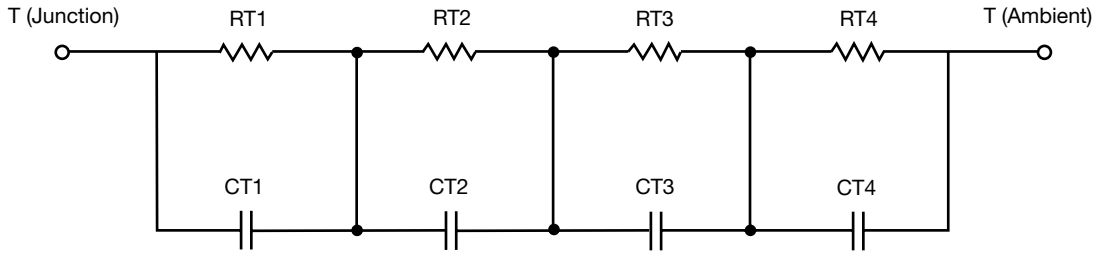
R-C Thermal Model Parameters

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

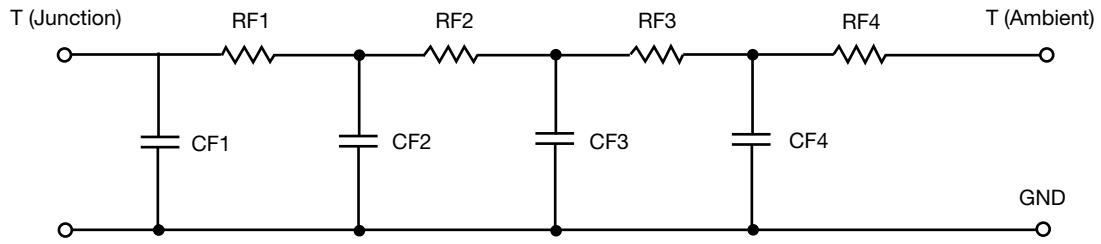


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.0336	23.4722 m	N/A
RT2	9.3314	688.2031 m	N/A
RT3	6.2693	1.8758	N/A
RT4	51.8152	911.2786 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	12.0631 m	1.3636 m	N/A
CT2	304.0603 m	1.2578 m	N/A
CT3	73.5835 m	9.8360 m	N/A
CT4	1.2863	8.1431 m	N/A

Note
N/A indicates not applicable

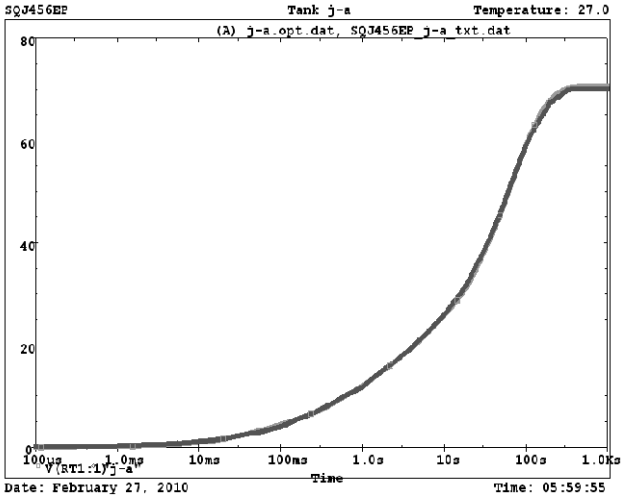
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

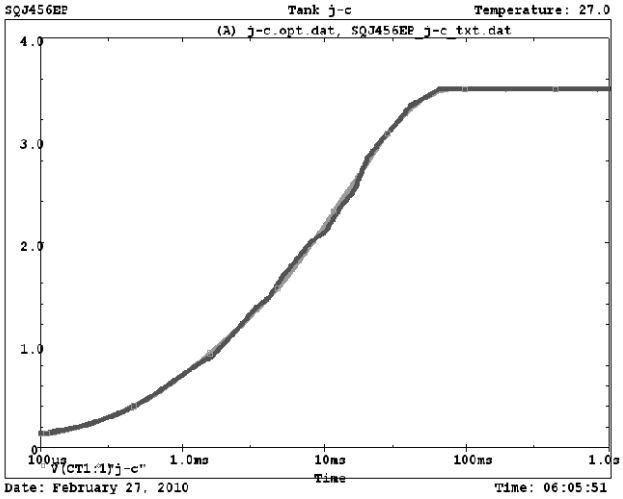
R-C THERMAL MODEL FOR FILTER CONFIGURATION

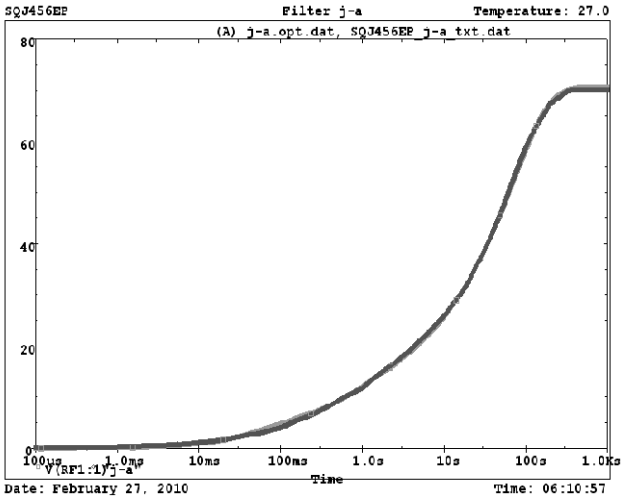


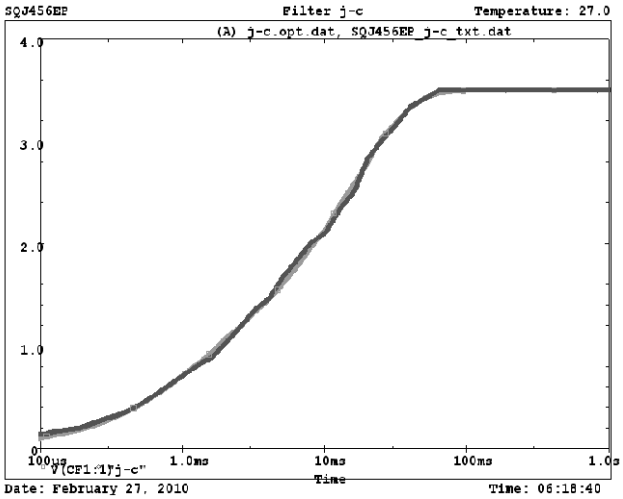
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.4827	10.7577 u	N/A
RF2	9.9545	1.1816	N/A
RF3	17.5487	1.2929	N/A
RF4	37.4972	1.0216	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	10.1325 m	379.0892 u	N/A
CF2	73.9415 m	563.9165 u	N/A
CF3	480.6324 m	5.0548 m	N/A
CF4	1.2577	869.8118 u	N/A

Note
N/A indicates not applicable


SQJ456EP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ456EP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)/j-a
Time
Date: February 27, 2010
Time: 05:59:55


SQJ456EP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ456EP_j-c_txt.dat
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)/j-c"
Time
Date: February 27, 2010
Time: 06:05:51


SQJ456EP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SQJ456EP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a"
Time
Date: February 27, 2010
Time: 06:10:57


SQJ456EP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQJ456EP_j-c_txt.dat
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)/j-c"
Time
Date: February 27, 2010
Time: 06:18:40