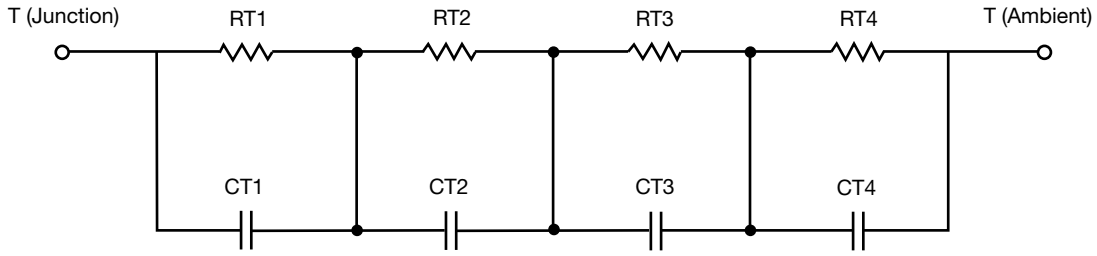
R-C Thermal Model Parameters

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

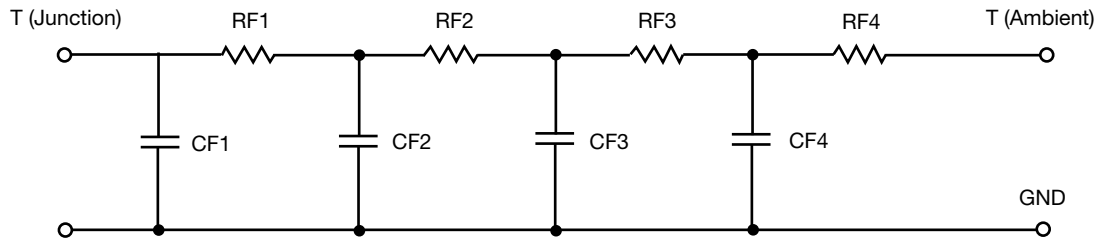


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	66.4204	N/A	9.0640
RT2	11.1431	N/A	2.7529
RT3	64.0084	N/A	7.5910
RT4	24.8037	N/A	30.5802
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3683	N/A	4.1353m
CT2	324.4026m	N/A	279.2346u
CT3	6.0954m	N/A	235.0834m
CT4	1.0586m	N/A	12.4041m

Note
N/A indicates not applicable

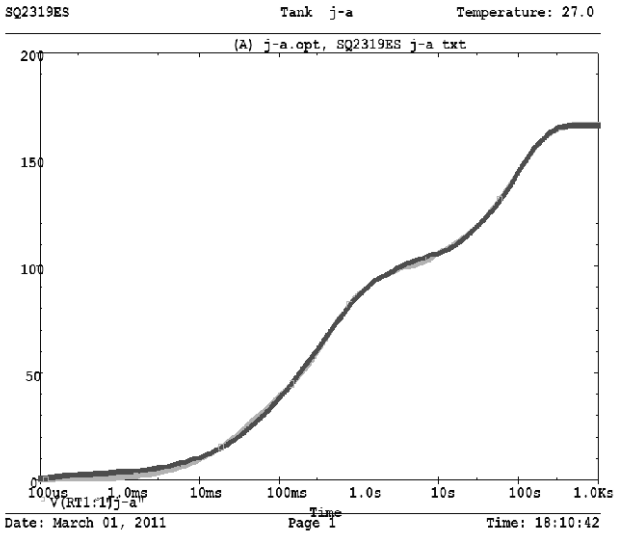
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

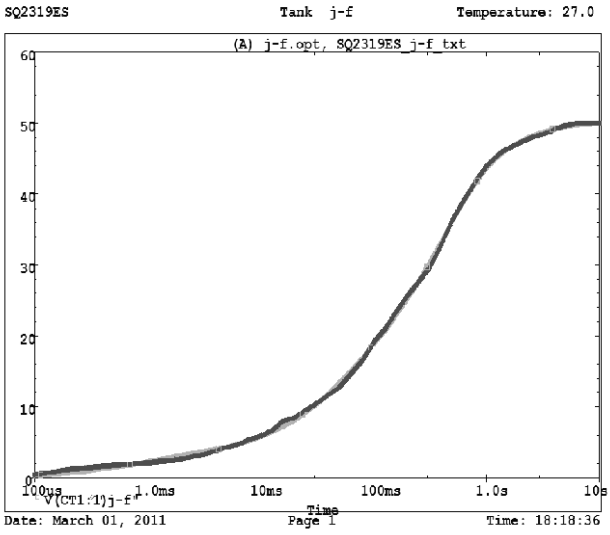
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.7852	N/A	4.5767
RF2	51.7144	N/A	19.6106
RF3	35.9552	N/A	23.0119
RF4	65.6044	N/A	3.2552
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	423.3505u	N/A	418.7427u
CF2	2.1262m	N/A	3.7693m
CF3	20.7106m	N/A	15.4893m
CF4	1.3310	N/A	1.0588

Note
N/A indicates not applicable


SQ2319ES
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ2319ES_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: March 01, 2011
Page 1
Time: 18:10:42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Tank j-f
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50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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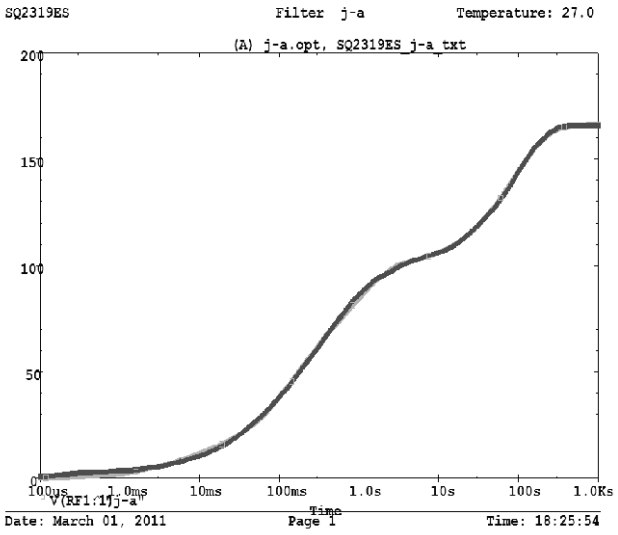
Time
Date: March 01, 2011
Page 1
Time: 18:18:36


SQ2319ES
Filter j-a
Temperature: 27.0
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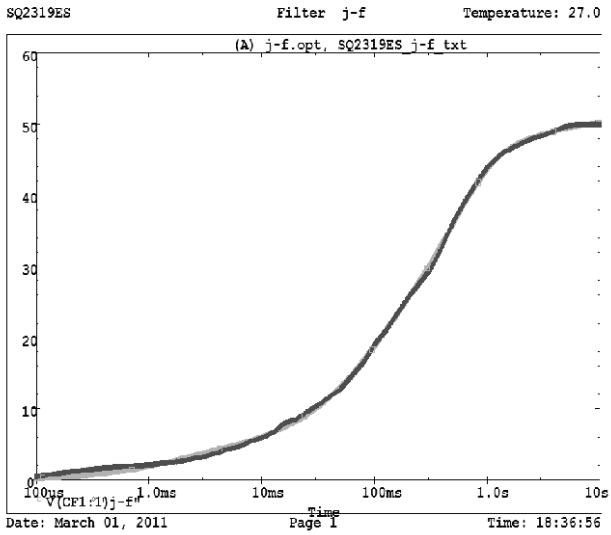
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: March 01, 2011
Page 1
Time: 18:25:54


SQ2319ES
Filter j-f
Temperature: 27.0
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60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-f
Time
Date: March 01, 2011
Page 1
Time: 18:36:56