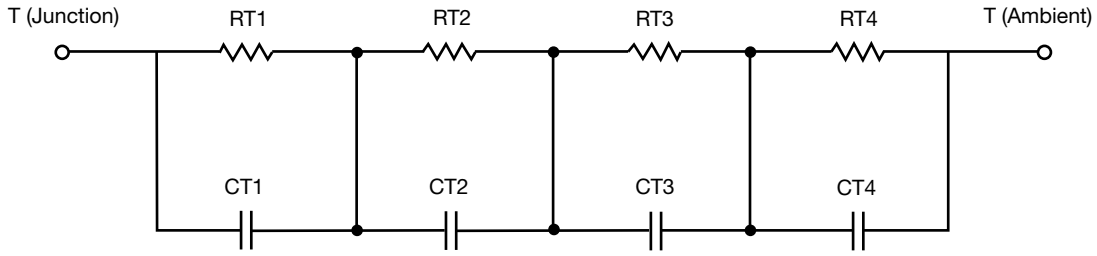
R-C Thermal Model Parameters

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

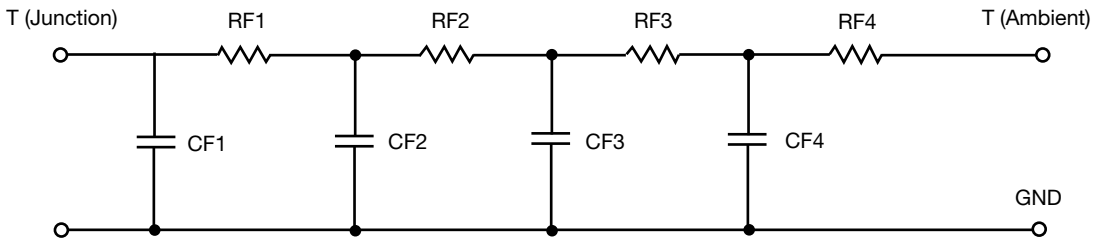


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	15.3292	764.1000m	N/A
RT2	28.6662	5.6063	N/A
RT3	22.9655	5.7425	N/A
RT4	42.0260	3.8871	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	127.7272u	5.0483m	N/A
CT2	2.8545m	54.4164u	N/A
CT3	48.1016m	452.2021u	N/A
CT4	1.0896	486.1773u	N/A

Note
N/A indicates not applicable

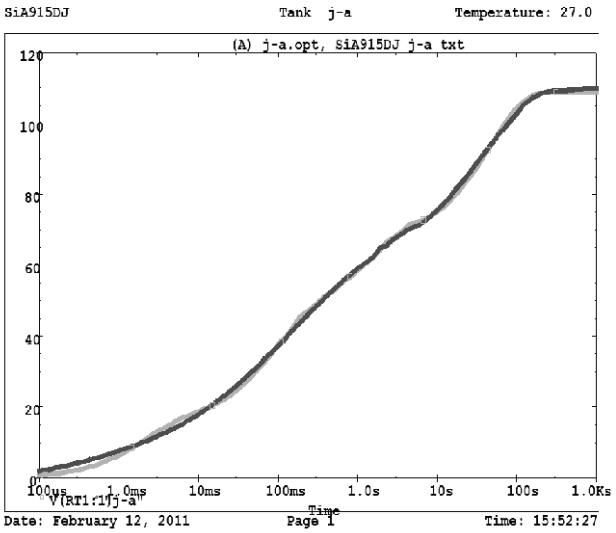
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

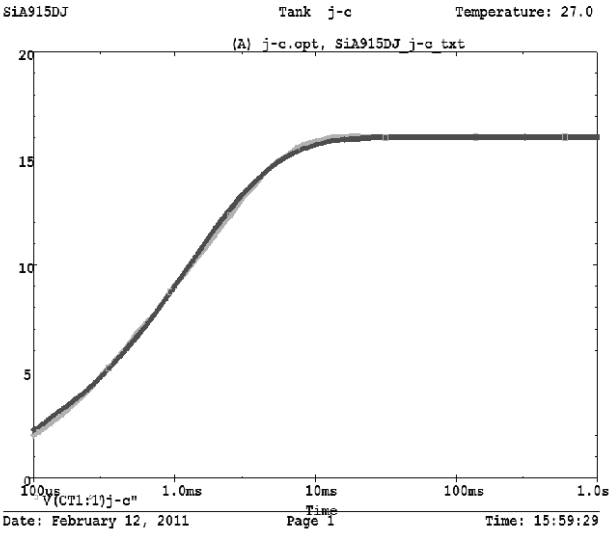
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.1639	8.6635	N/A
RF2	31.0125	4.0091	N/A
RF3	23.5203	1.6771	N/A
RF4	40.1153	1.6503	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	92.1970u	43.9117u	N/A
CF2	2.0902m	226.4934u	N/A
CF3	41.7854m	229.4698u	N/A
CF4	1.0856	103.4306u	N/A

Note
N/A indicates not applicable


SiA915DJ
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiA915DJ_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: February 12, 2011
Page 1
Time: 15:52:27


SiA915DJ
Tank j-c
Temperature: 27.0
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20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
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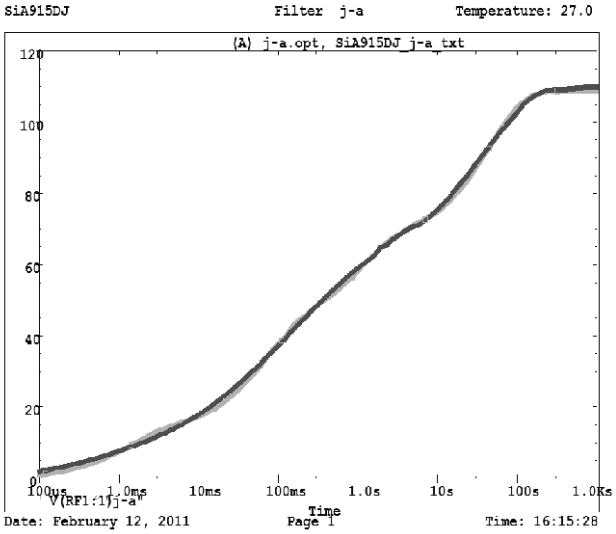
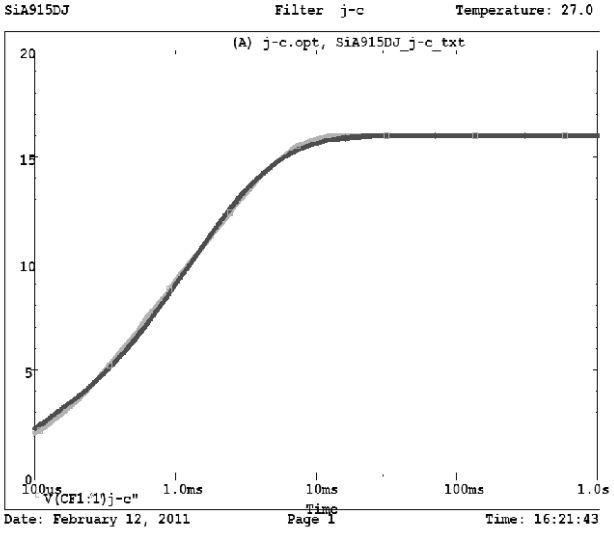
Time
Date: February 12, 2011
Page 1
Time: 15:59:29


SiA915DJ
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiA915DJ_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: February 12, 2011
Page 1
Time: 16:15:28


SiA915DJ
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiA915DJ_j-c_txt
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: February 12, 2011
Page 1
Time: 16:21:43