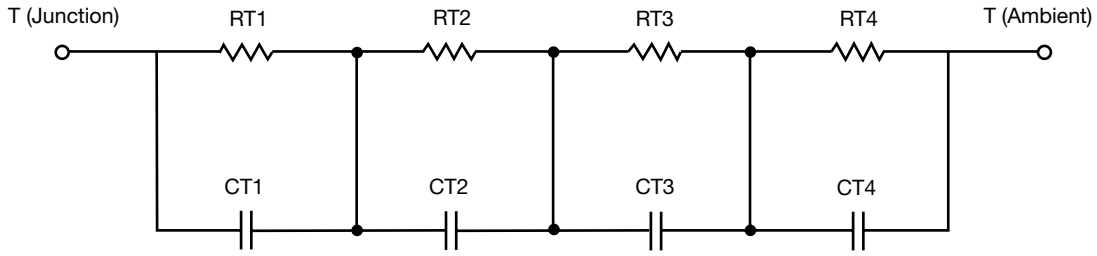
R-C Thermal Model Parameters

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

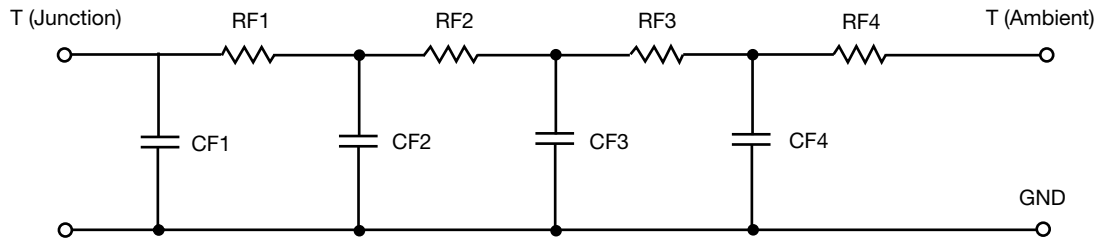


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.3524	N/A	1.7799
RT2	24.6675	N/A	11.5842
RT3	21.6523	N/A	14.4016
RT4	56.8684	N/A	2.5477
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	965.5677u	N/A	461.8959m
CT2	6.7052m	N/A	3.4054m
CT3	36.6691m	N/A	10.8623m
CT4	1.2714	N/A	461.9624u

Note
N/A indicates not applicable

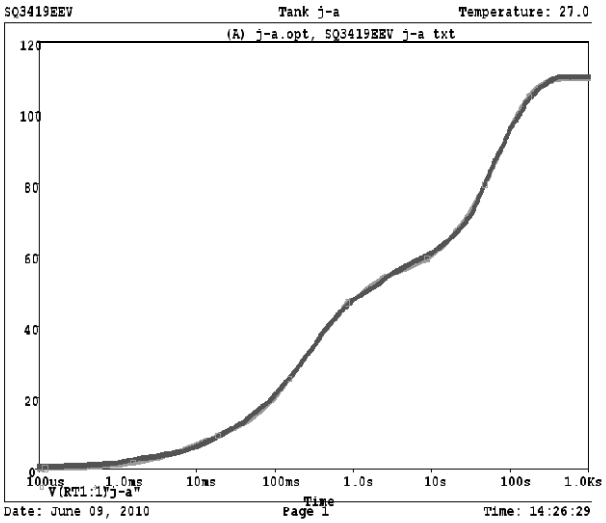
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

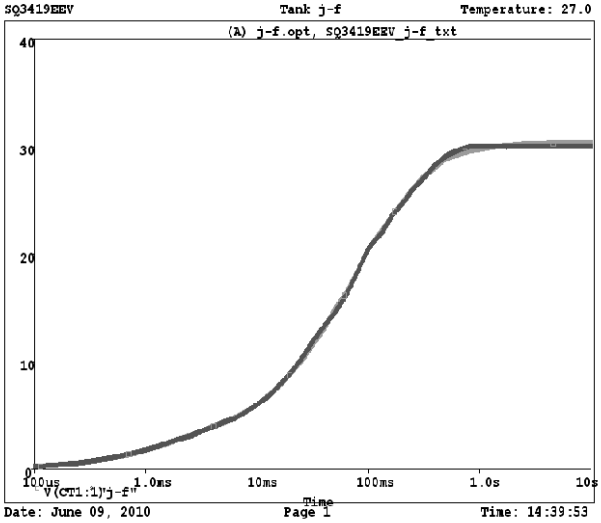
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.0440	N/A	6.1891
RF2	38.0468	N/A	20.6839
RF3	30.0101	N/A	1.6698
RF4	28.7693	N/A	1.4981
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0508m	N/A	637.9799u
CF2	8.1652m	N/A	3.2921m
CF3	912.7581m	N/A	107.6610m
CF4	1.3225	N/A	5.1468m

Note
N/A indicates not applicable


SQ3419EEV
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ3419EEV_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)"j-a"
Time
Date: June 09, 2010
Page 1
Time: 14:26:29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30
20
10
0
100us
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10ms
100ms
1.0s
10s
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Time
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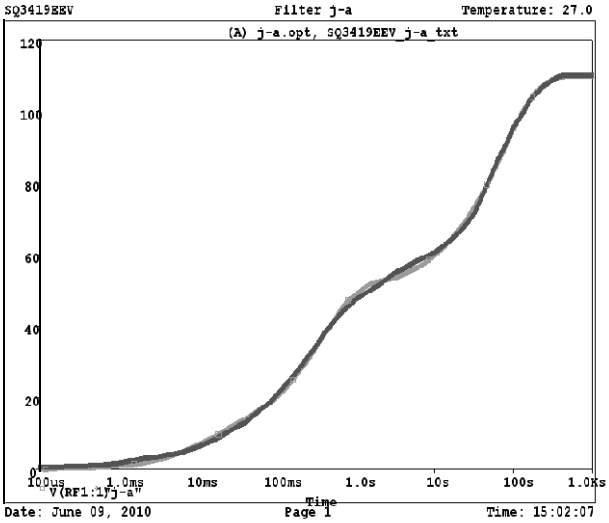
Page 1
Time: 14:39:53


SQ3419EEV
Filter j-a
Temperature: 27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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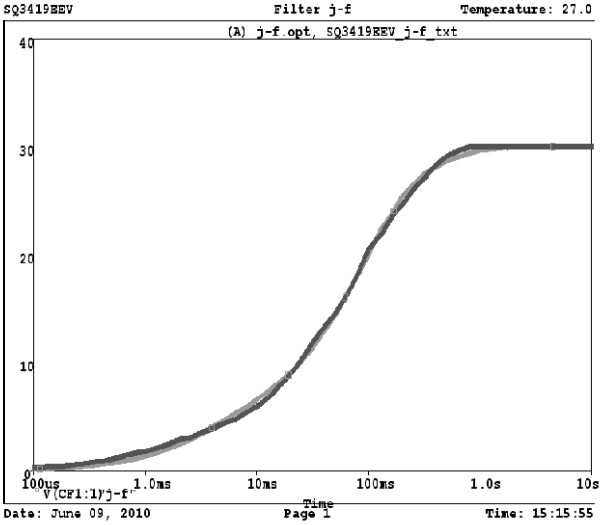
Time
Date: June 09, 2010
Page 1
Time: 15:02:07


SQ3419EEV
Filter j-f
Temperature: 27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)"j-f"
Time
Date: June 09, 2010
Page 1
Time: 15:15:55