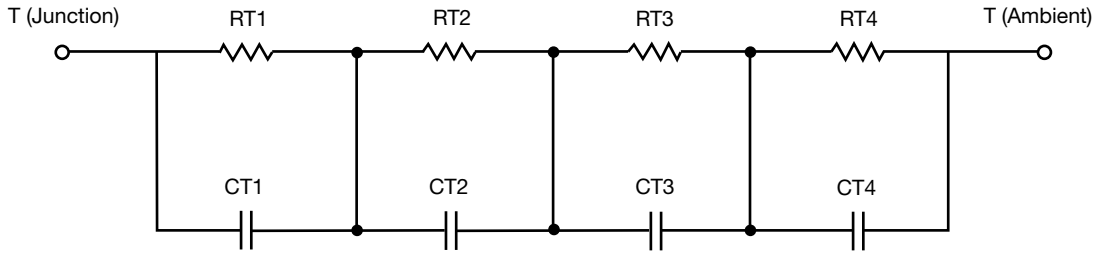
R-C Thermal Model Parameters

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

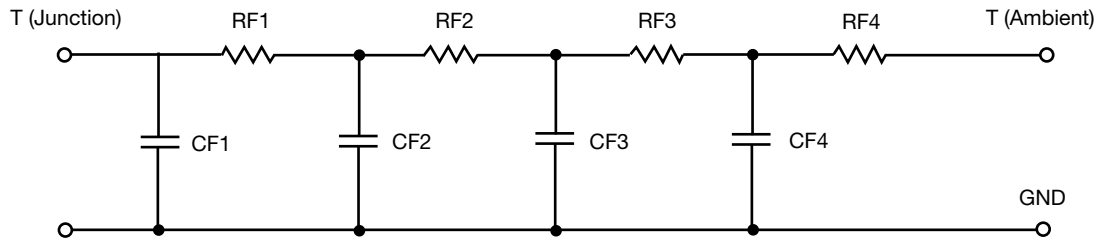


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.8606	N/A	10.9792
RT2	31.7675	N/A	2.9820
RT3	12.6957	N/A	5.6981
RT4	56.4234	N/A	10.2965
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.1919m	N/A	20.2814m
CT2	7.6614m	N/A	536.3378u
CT3	110.9649m	N/A	5.8402m
CT4	1.3275	N/A	7.1606m

Note
N/A indicates not applicable

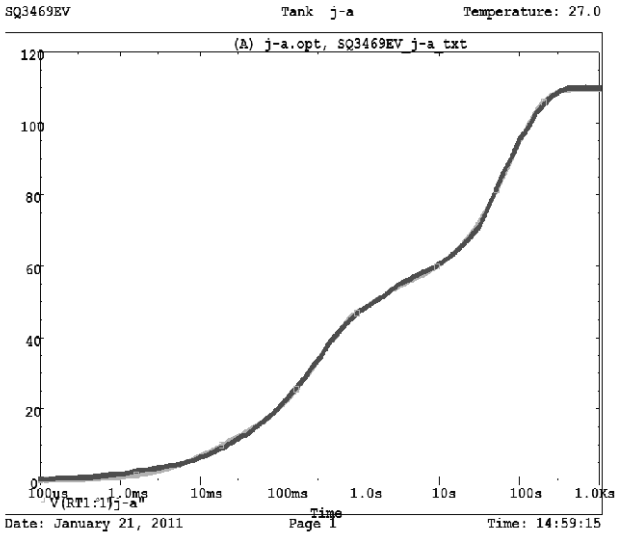
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

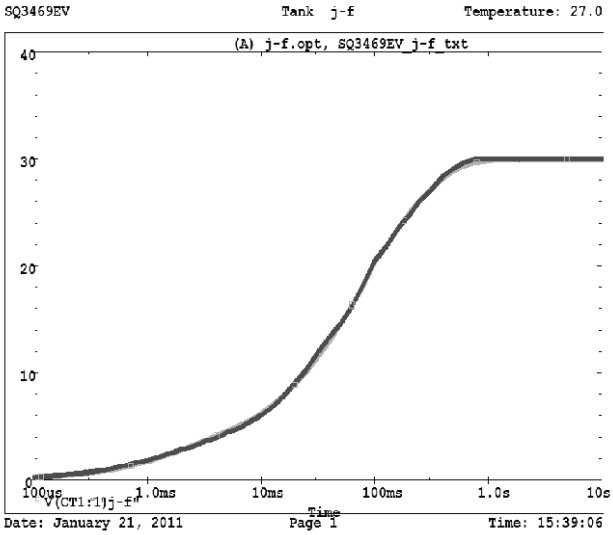
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	11.8208	N/A	4.6293
RF2	33.6520	N/A	9.1230
RF3	11.5640	N/A	7.5298
RF4	52.7304	N/A	8.7102
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0393m	N/A	553.6122u
CF2	6.4117m	N/A	2.2404m
CF3	163.9744m	N/A	590.5498u
CF4	1.2748	N/A	14.8542m

Note
N/A indicates not applicable


SQ3469EV
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ3469EV_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: January 21, 2011
Page 1
Time: 14:59:15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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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Time
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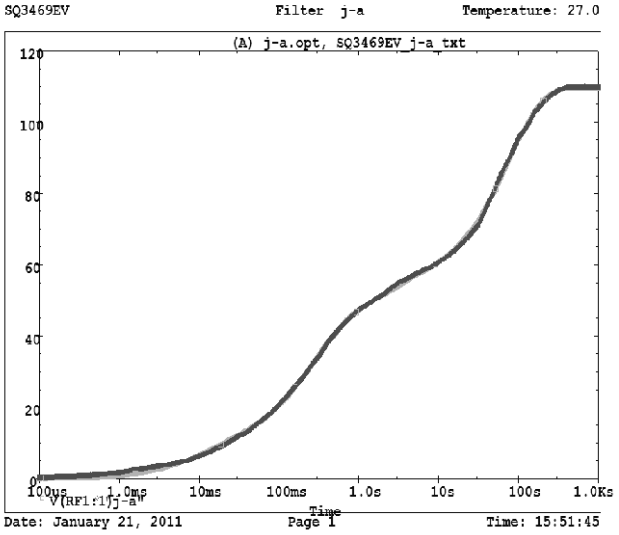
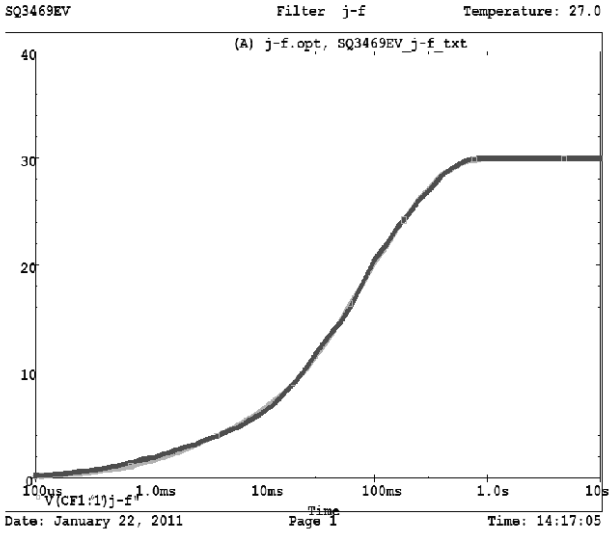
Page 1
Time: 15:39:06


SQ3469EV
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQ3469EV_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: January 21, 2011
Page 1
Time: 15:51:45


SQ3469EV
Filter j-f
Temperature: 27.0
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-f
Time
Date: January 22, 2011
Page 1
Time: 14:17:05