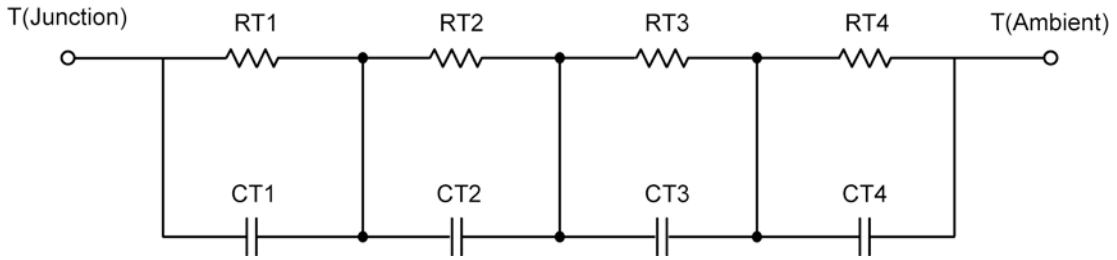
R-C Thermal Model Parameters

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."

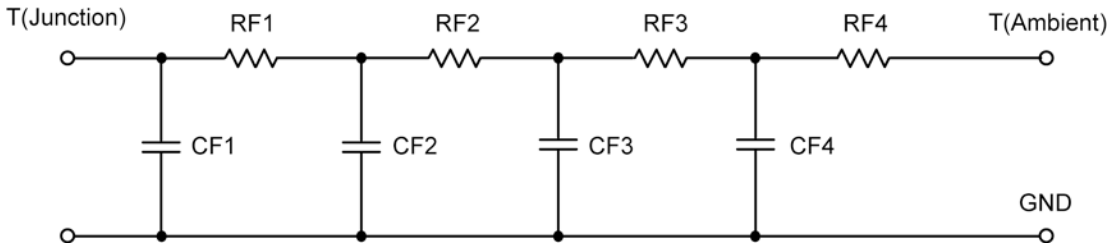
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.8734	N/A	7.6190
RT2	45.8975	N/A	2.1850
RT3	24.6642	N/A	9.7777
RT4	27.5649	N/A	10.4183
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.8936 m	N/A	6.2299 m
CT2	9.9473 m	N/A	455.2646 u
CT3	1.6611	N/A	29.9265 m
CT4	3.0050	N/A	8.6093 m

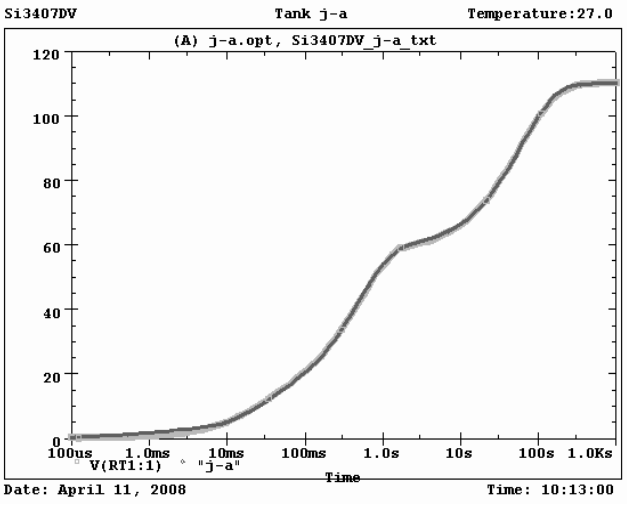
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

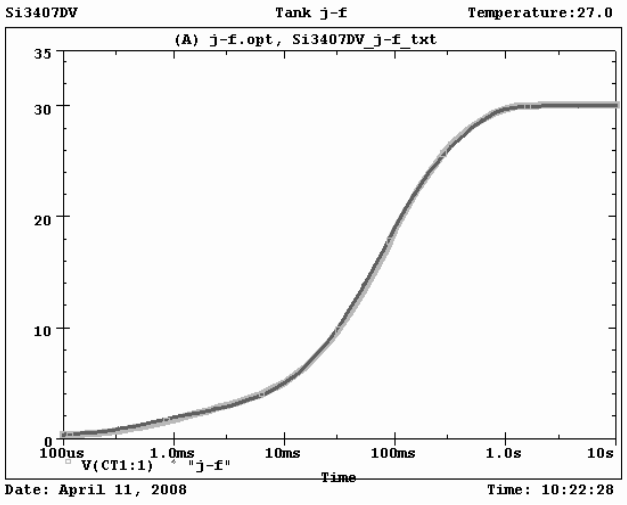
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	17.2094	N/A	3.1928
RF2	42.2863	N/A	9.9031
RF3	33.4586	N/A	9.8906
RF4	17.0457	N/A	7.0135
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.7394 m	N/A	477.0639 u
CF2	9.1475 m	N/A	2.5542 m
CF3	1.1711	N/A	692.2275 u
CF4	116.5100 m	N/A	33.3637 m

Note: NA indicates not applicable


Si3407DV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3407DV_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: April 11, 2008
Time: 10:13:00


Si3407DV
Tank j-f
Temperature:27.0
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30
20
10
0
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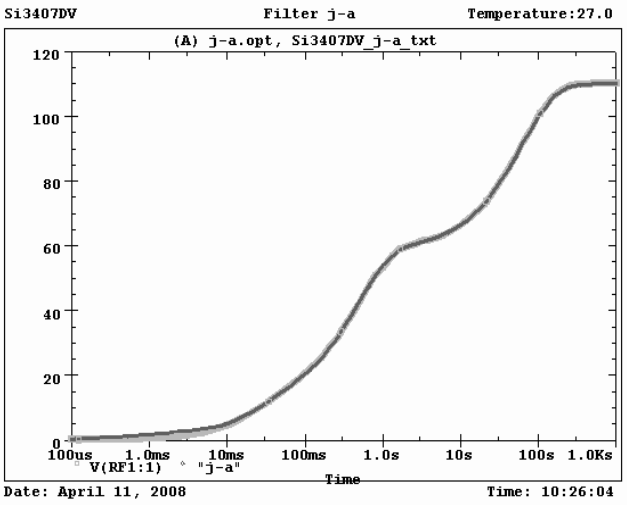
Si3407DV
Filter j-a
Temperature:27.0
(A) j-a.opt, Si3407DV_j-a_txt
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100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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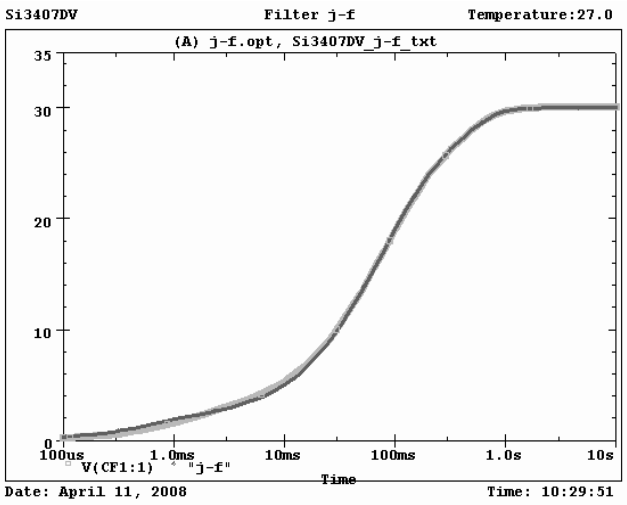
Time: 10:26:04


Si3407DV
Filter j-f
Temperature:27.0
(A) j-f.opt, Si3407DV_j-f_txt
35
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: April 11, 2008
Time: 10:29:51