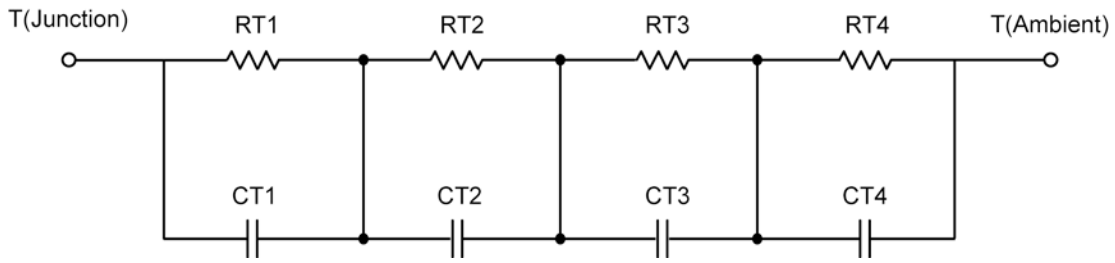
R-C Thermal Model Parameters

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."

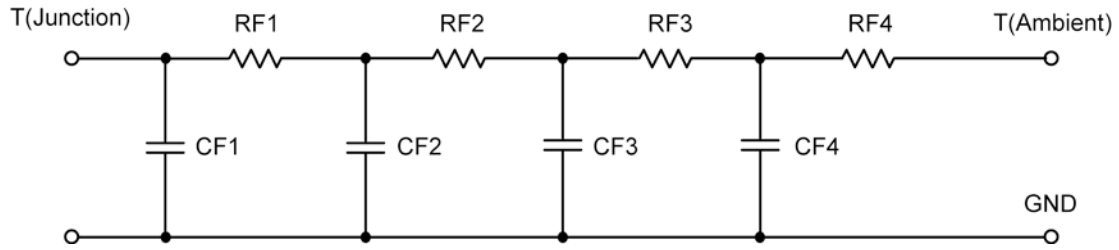
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	40.0335	N/A	3.5374
RT2	36.9267	N/A	23.4223
RT3	10.8043	N/A	7.2772
RT4	42.2355	N/A	5.7631
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2404 m	N/A	23.4573 m
CT2	19.4870 m	N/A	1.3795 m
CT3	110.4283 u	N/A	121.4392 u
CT4	1.5356	N/A	1.4576 m

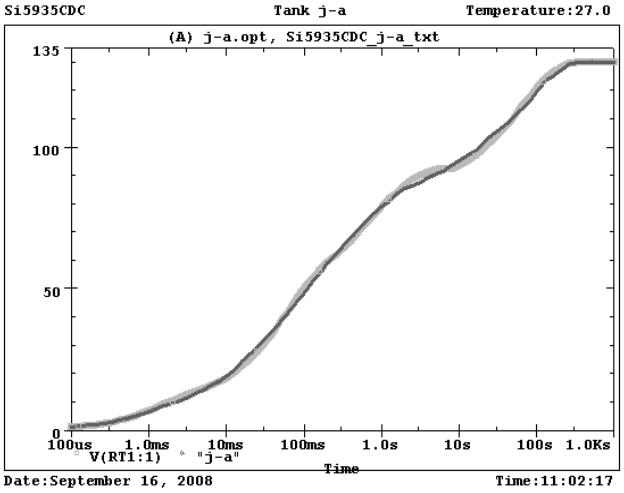
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

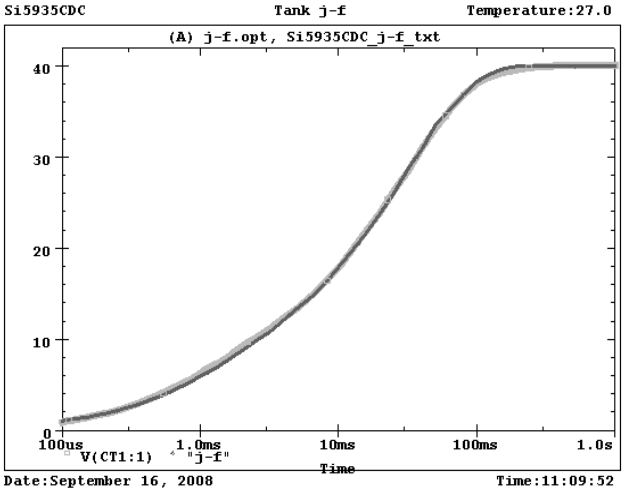
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	10.2597	N/A	7.7124
RF2	45.6704	N/A	11.9397
RF3	32.9683	N/A	15.6135
RF4	41.1016	N/A	4.7344
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	80.7190 u	N/A	96.9375 u
CF2	970.5727 u	N/A	468.7502 u
CF3	21.7717 m	N/A	576.8647 u
CF4	1.5656	N/A	8.9259 m

Note
NA indicates not applicable


Si5935CDC
Tank j-a
Temperature:27.0
(A) j-a.opt, Si5935CDC_j-a_txt
135
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date:September 16, 2008
Time:11:02:17


Si5935CDC
Tank j-f
Temperature:27.0
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30
20
10
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Time
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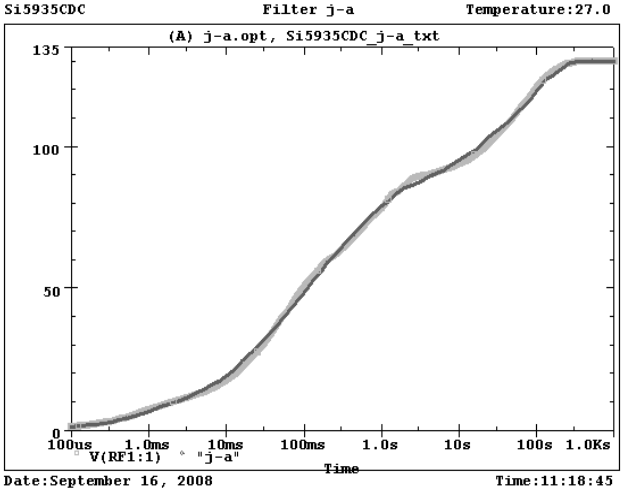
Time:11:09:52


Si5935CDC
Filter j-a
Temperature:27.0
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135
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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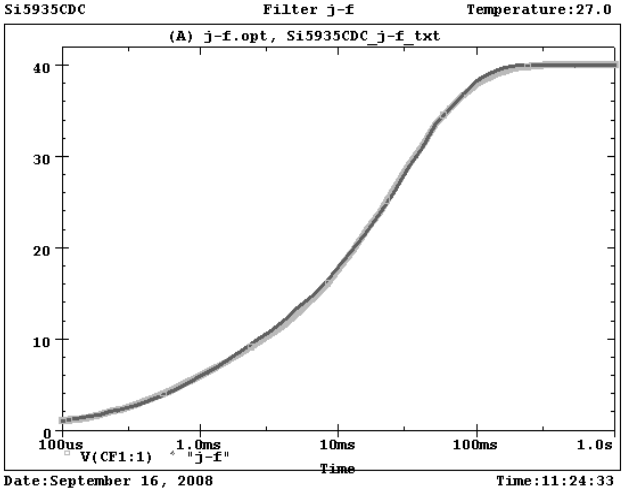
Time
Date:September 16, 2008
Time:11:18:45


Si5935CDC
Filter j-f
Temperature:27.0
(A) j-f.opt, Si5935CDC_j-f_txt
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s
V(CF1:1) "j-f"
Time
Date:September 16, 2008
Time:11:24:33