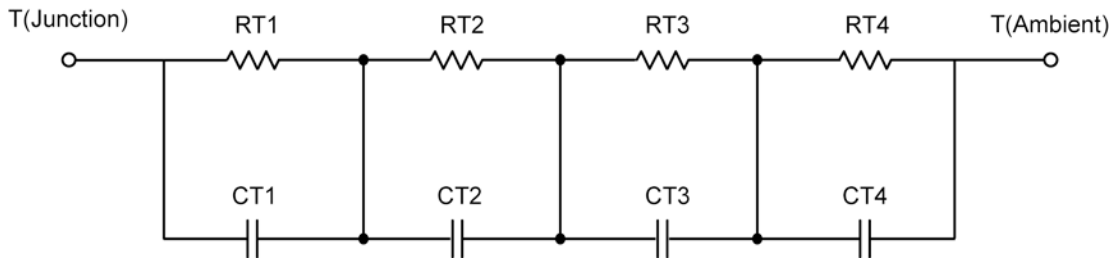
R-C Thermal Model Parameters

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."

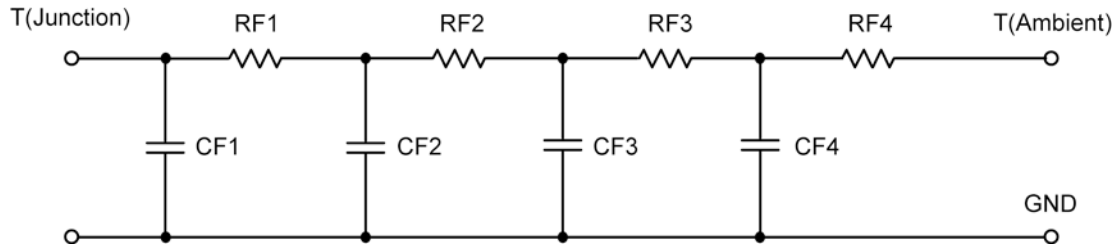
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	51.5349	N/A	16.1115
RT2	19.0585	N/A	5.8203
RT3	31.9672	N/A	5.4349
RT4	17.4394	N/A	18.6333
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3274	N/A	1.3153 m
CT2	265.7362 m	N/A	831.7734 u
CT3	5.5713 m	N/A	78.6534 m
CT4	215.2069 u	N/A	5.8333 m

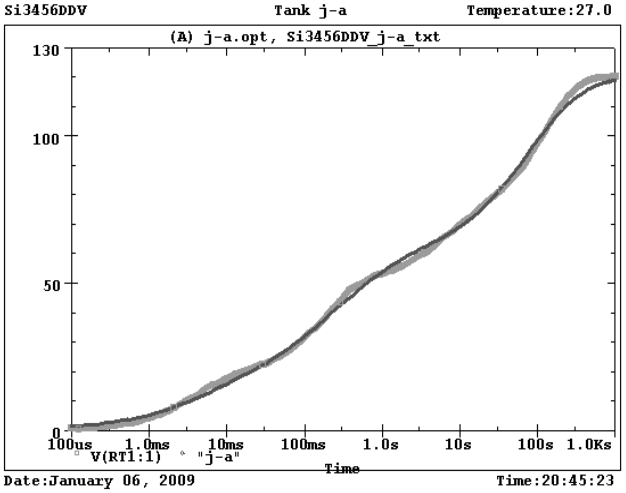
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

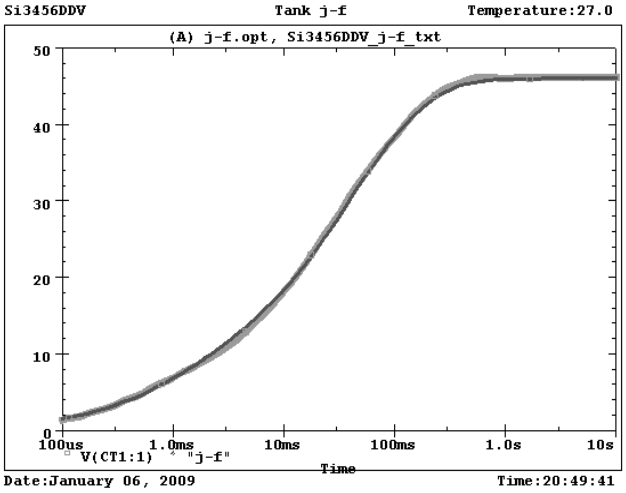
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.7004	N/A	10.4511
RF2	32.2643	N/A	22.6298
RF3	20.6899	N/A	1.7583
RF4	48.3454	N/A	11.1608
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	227.2019 u	N/A	88.1241 u
CF2	5.7260 m	N/A	832.8508 u
CF3	193.2558 m	N/A	6.5222 m
CF4	2.3050	N/A	2.1032 m

Note
NA indicates not applicable


Si3456DDV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3456DDV_j-a_txt
130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date:January 06, 2009
Time:20:45:23


Si3456DDV
Tank j-f
Temperature:27.0
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50
40
30
20
10
0
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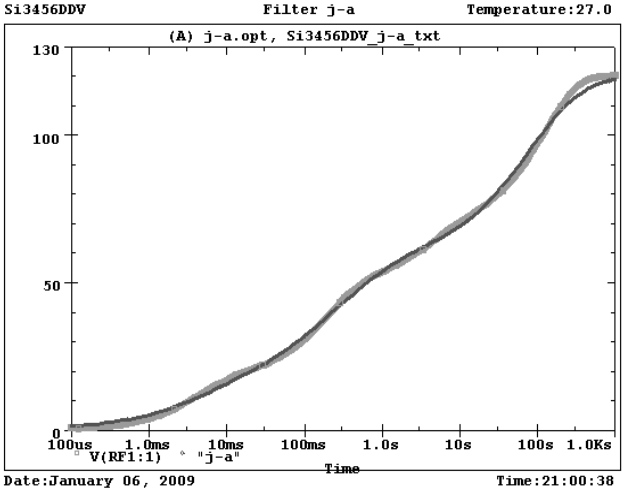
Time:20:49:41


Si3456DDV
Filter j-a
Temperature:27.0
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130
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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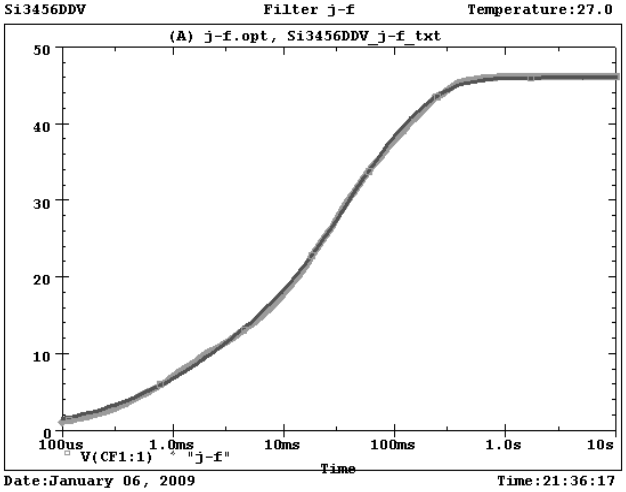
Time
Date:January 06, 2009
Time:21:00:38


Si3456DDV
Filter j-f
Temperature:27.0
(A) j-f.opt, Si3456DDV_j-f_txt
50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date:January 06, 2009
Time:21:36:17