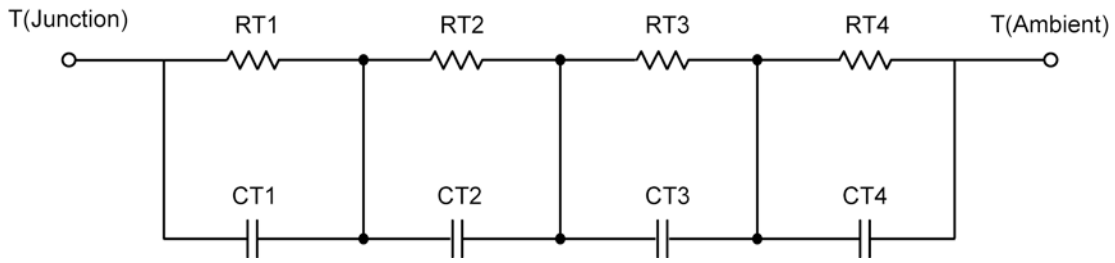
R-C Thermal Model Parameters

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."

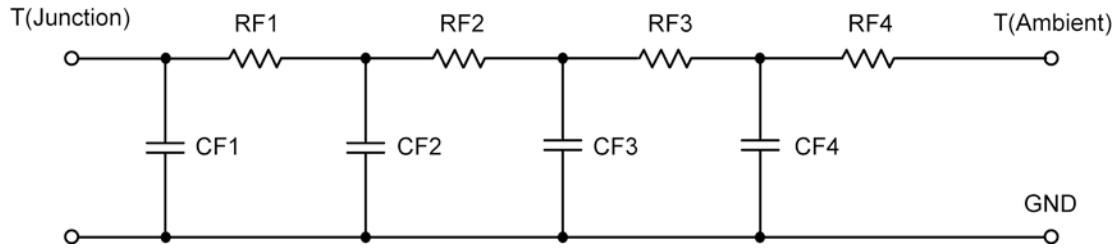
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	22.6239	N/A	2.9555
RT2	5.5371	N/A	9.6714
RT3	19.6198	N/A	5.2818
RT4	47.2192	N/A	4.0913
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.2942 m	N/A	350.5225 m
CT2	413.1296 u	N/A	1.7526 m
CT3	71.8083 m	N/A	3.1424 m
CT4	1.6731	N/A	211.0064 u

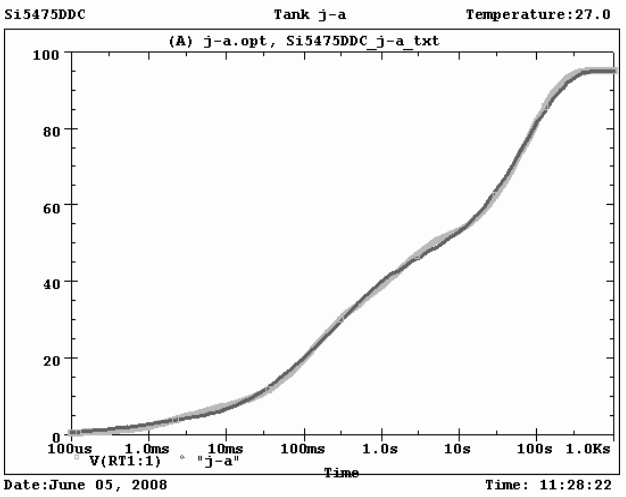
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

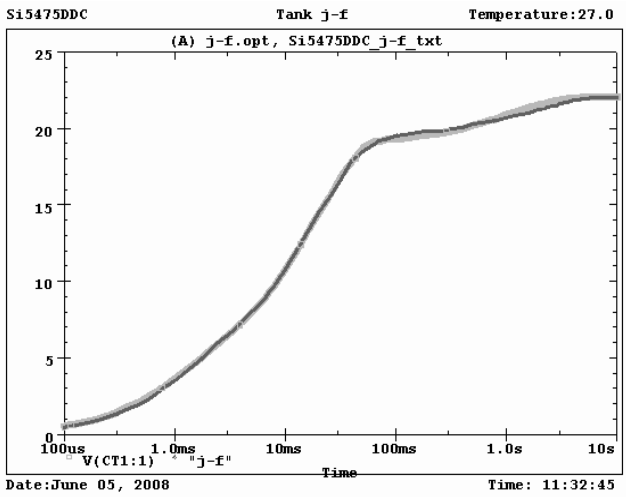
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.3231	N/A	7.0820
RF2	24.3905	N/A	7.7875
RF3	18.9915	N/A	4.6993
RF4	46.2949	N/A	2.4312
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	292.3487 u	N/A	227.8687 u
CF2	3.9300 m	N/A	1.0478 m
CF3	57.3517 m	N/A	1.8691 m
CF4	1.6058	N/A	534.9725 m

Note
NA indicates not applicable


Si5475DDC
Tank j-a
Temperature:27.0
(A) j-a.opt, Si5475DDC_j-a_txt
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 05, 2008
Time: 11:28:22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Tank j-f
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25
20
15
10
5
0
100us
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100ms
1.0s
10s
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Time
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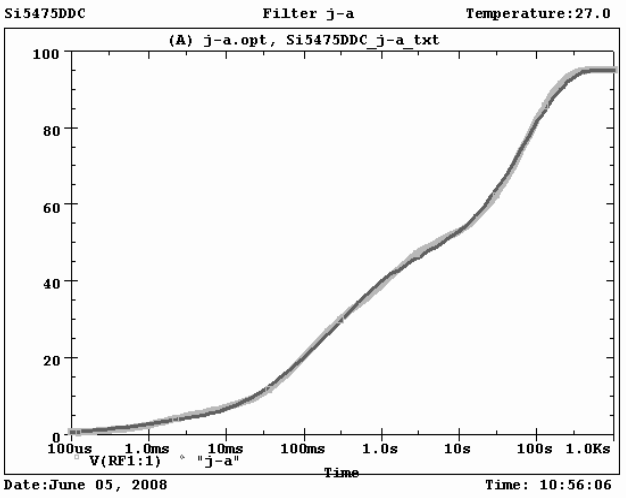
Time: 11:32:45


Si5475DDC
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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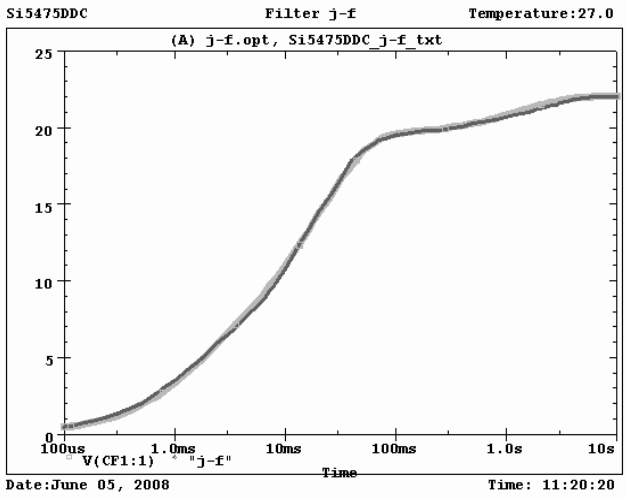
"j-a"
Time
Date:June 05, 2008
Time: 10:56:06


Si5475DDC
Filter j-f
Temperature:27.0
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25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:June 05, 2008
Time: 11:20:20