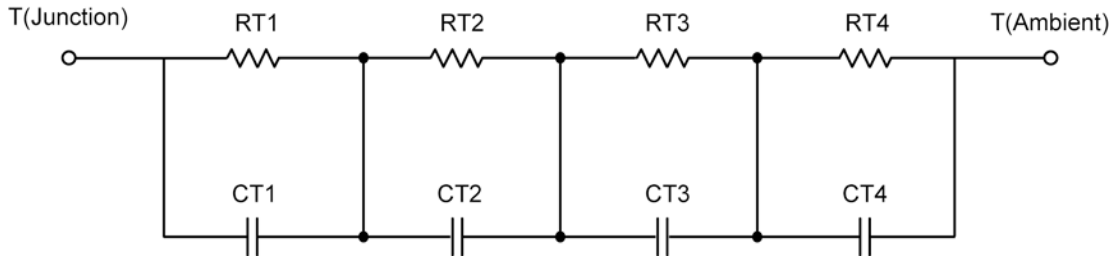
R-C Thermal Model Parameters

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."

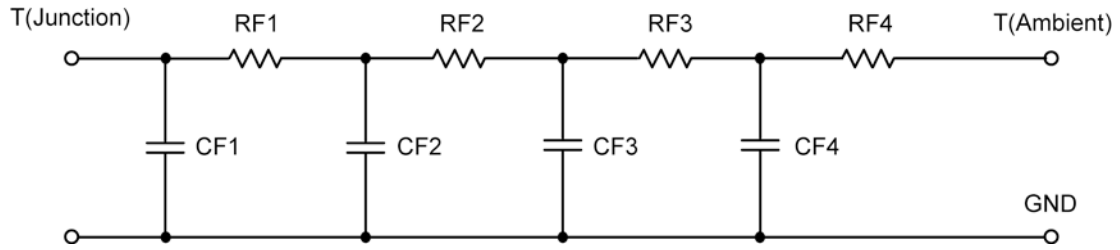
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.4531	N/A	3.4548
RT2	5.2501	N/A	11.7274
RT3	13.6152	N/A	7.4925
RT4	44.6816	N/A	2.3253
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	109.6108 m	N/A	185.6016 m
CT2	2.1473 m	N/A	88.5401 m
CT3	26.6271 m	N/A	9.1880 m
CT4	1.4542	N/A	742.4343 u

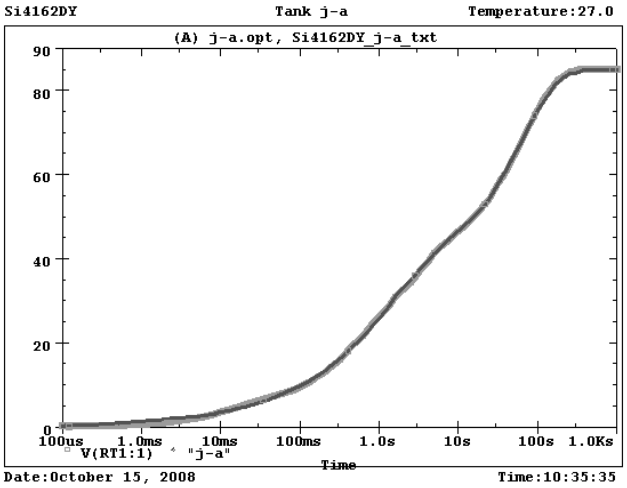
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

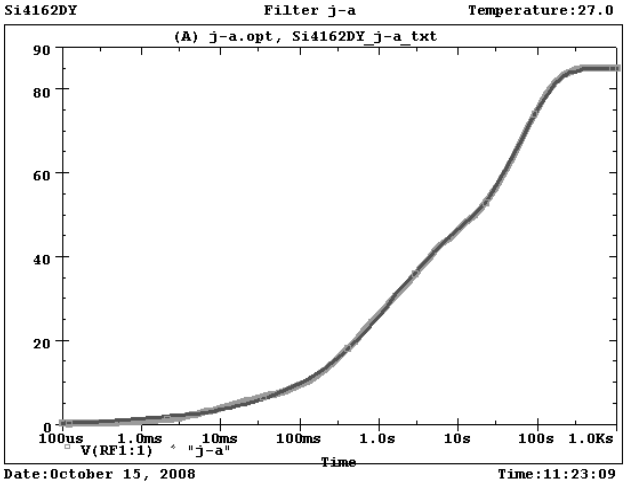
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.8488	N/A	2.8487
RF2	20.5135	N/A	9.4381
RF3	17.5854	N/A	10.0088
RF4	41.0523	N/A	2.7044
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.6000 m	N/A	632.0179 u
CF2	19.3942 m	N/A	8.1358 m
CF3	118.2449 m	N/A	60.0864 m
CF4	1.4594	N/A	63.1557 m

Note
NA indicates not applicable


Si4162DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4162DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:October 15, 2008
Time:10:35:35


Si4162DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4162DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
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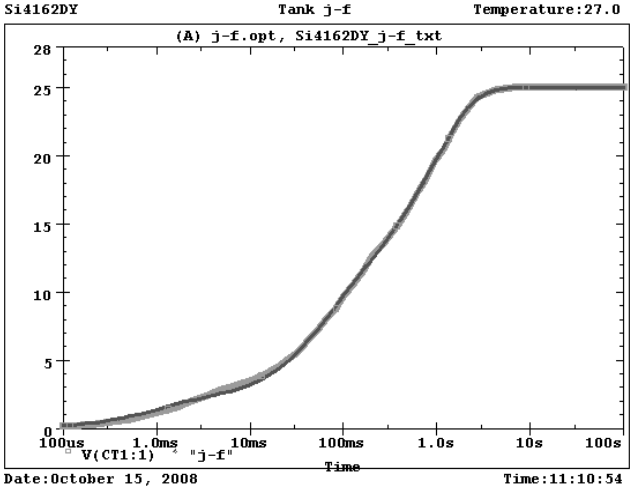
Time
Date:October 15, 2008
Time:11:23:09


Si4162DY
Tank j-f
Temperature:27.0
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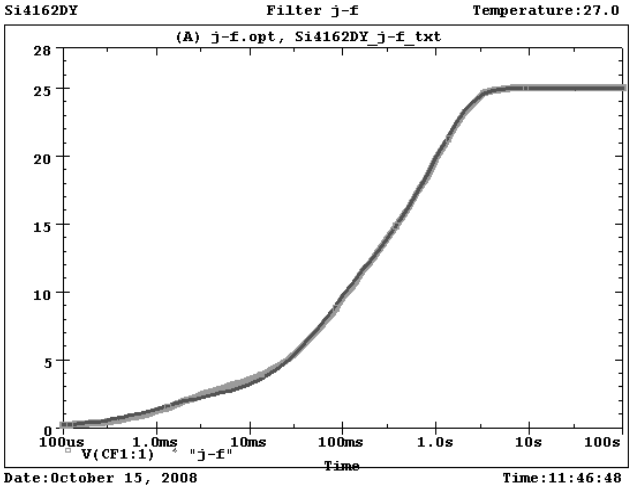
28
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-f"
Time
Date:October 15, 2008
Time:11:10:54


Si4162DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4162DY_j-f_txt
28
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date:October 15, 2008
Time:11:46:48