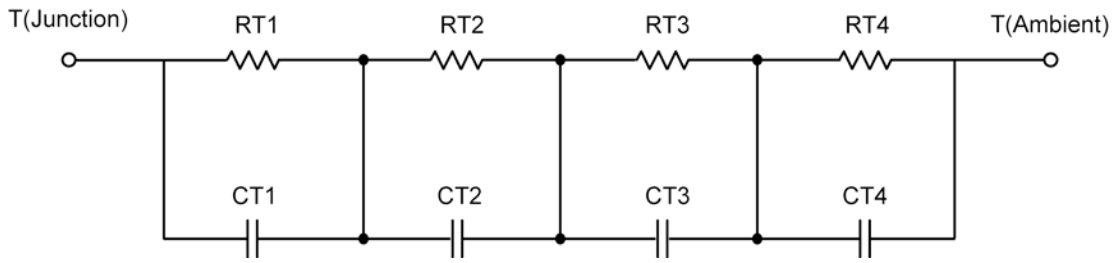
R-C Thermal Model Parameters

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."

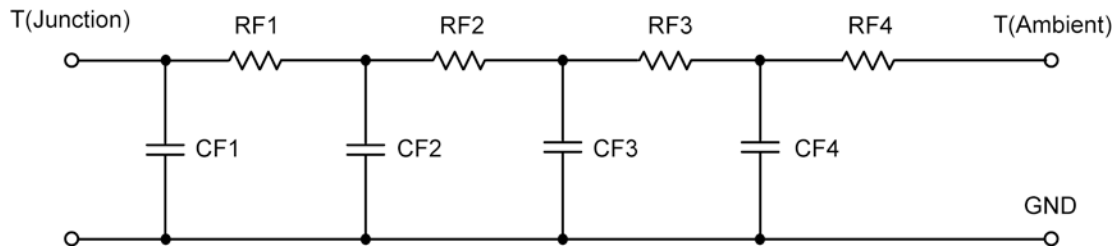
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.7537	N/A	4.2186
RT2	16.7695	N/A	1.0361
RT3	51.8359	N/A	11.6031
RT4	9.6409	N/A	4.1422
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.8558 m	N/A	18.8172 m
CT2	69.6344 m	N/A	4.1098 m
CT3	1.5505	N/A	121.6219 m
CT4	244.6602 m	N/A	35.2676 m

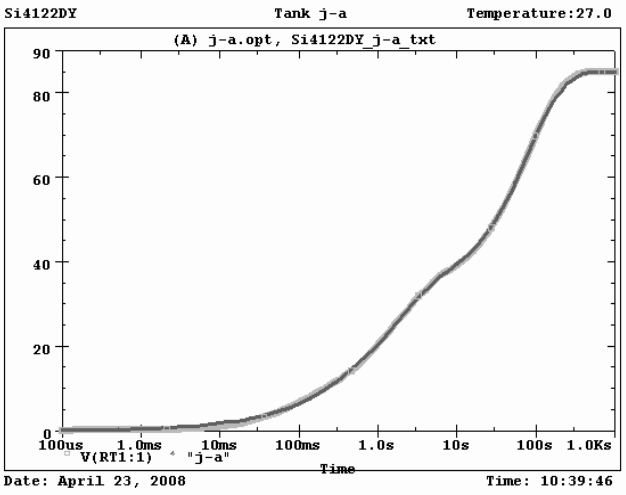
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

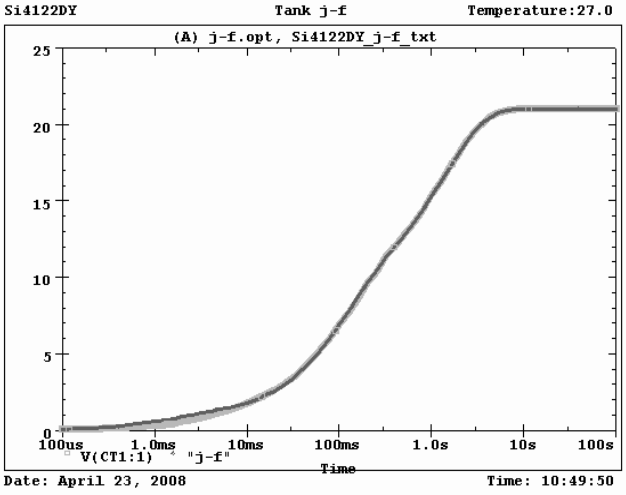
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.0882	N/A	1.4513
RF2	25.2116	N/A	7.8804
RF3	27.9345	N/A	5.4411
RF4	24.7657	N/A	6.2272
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	6.9296 m	N/A	2.5317 m
CF2	38.0230 m	N/A	7.5775 m
CF3	1.0367	N/A	56.9425 m
CF4	1.9145	N/A	140.2885 m

Note
NA indicates not applicable


Si4122DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4122DY_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: April 23, 2008
Time: 10:39:46


Si4122DY
Tank j-f
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20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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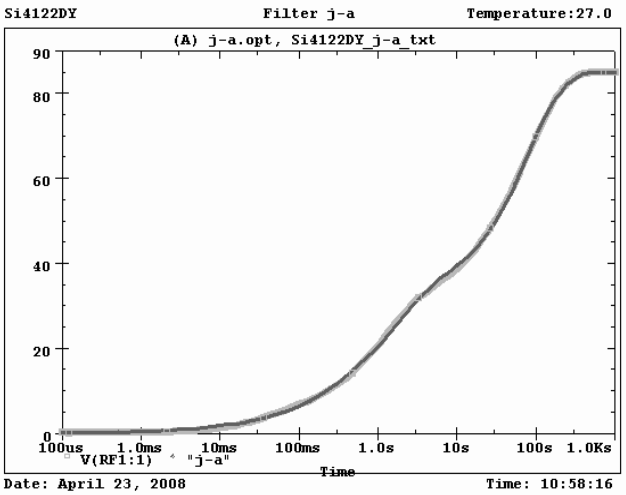
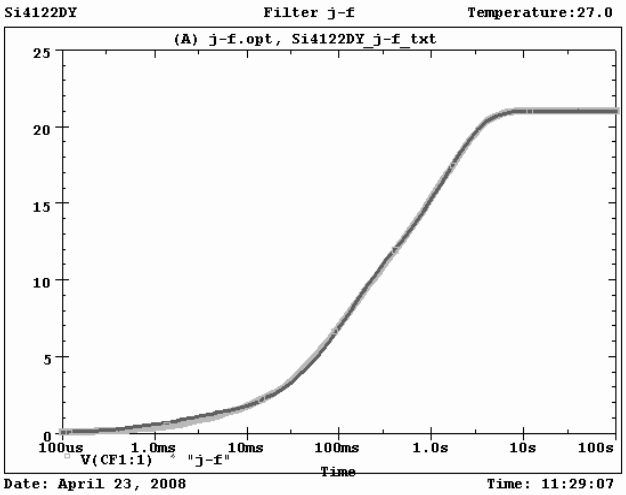
Time
Date: April 23, 2008
Time: 10:49:50


Si4122DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4122DY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: April 23, 2008
Time: 10:58:16


Si4122DY
Filter j-f
Temperature:27.0
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25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: April 23, 2008
Time: 11:29:07