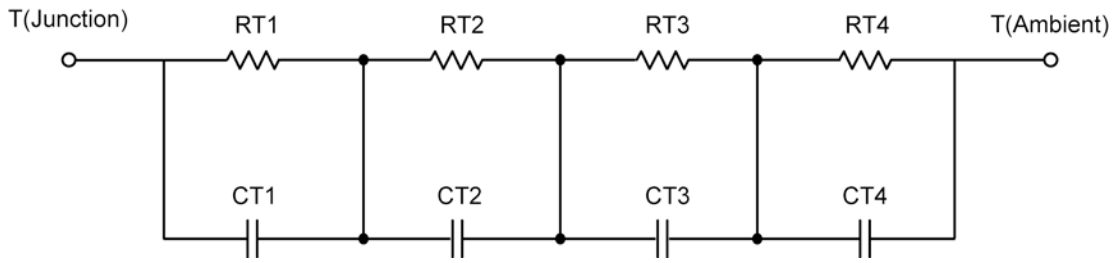
R-C Thermal Model Parameters

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."

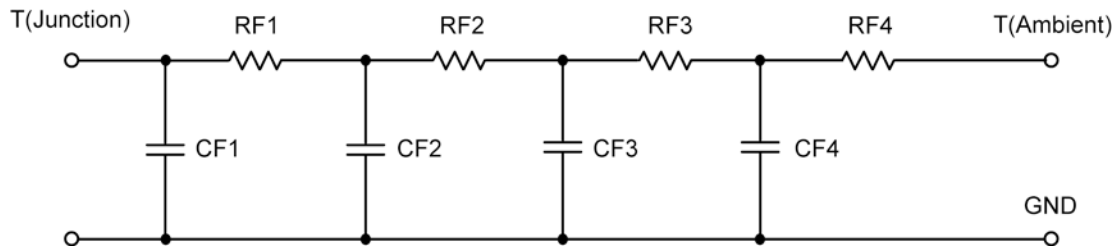
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.6042	N/A	5.4511
RT2	1.5252	N/A	148.9000 m
RT3	54.0641	N/A	1.7798
RT4	17.8065	N/A	8.6202
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	54.2502 m	N/A	14.8746 m
CT2	3.0645 m	N/A	55.1251 m
CT3	1.3998	N/A	1.7279
CT4	92.4527 m	N/A	127.6705 m

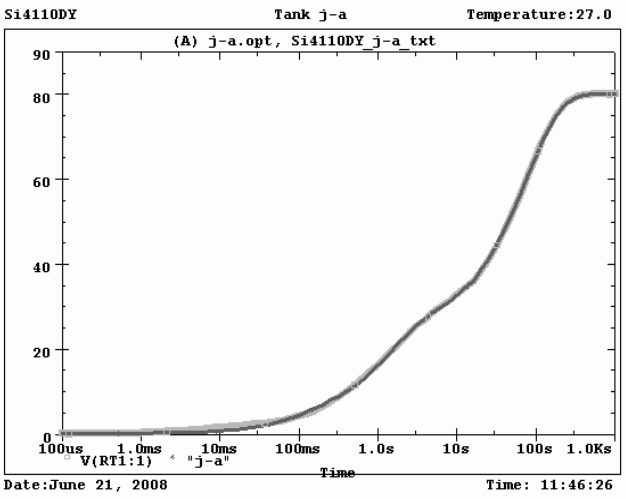
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

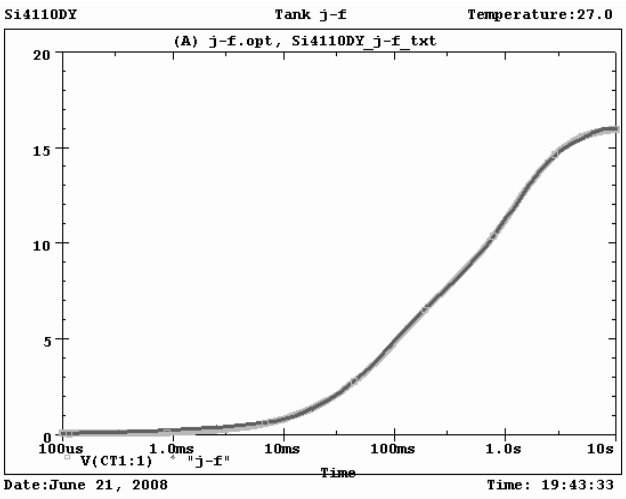
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	508.2000 m	N/A	123.6000 m
RF2	17.0964	N/A	6.5619
RF3	12.1063	N/A	5.4633
RF4	50.2891	N/A	3.8512
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.6007 m	N/A	1.4112 m
CF2	26.5293 m	N/A	11.5311 m
CF3	144.8467 m	N/A	92.7573 m
CF4	1.3405	N/A	222.2911 m

Note
NA indicates not applicable


Si4110DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4110DY_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:June 21, 2008
Time: 11:46:26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Tank j-f
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15
10
5
0
100us
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10ms
100ms
1.0s
10s
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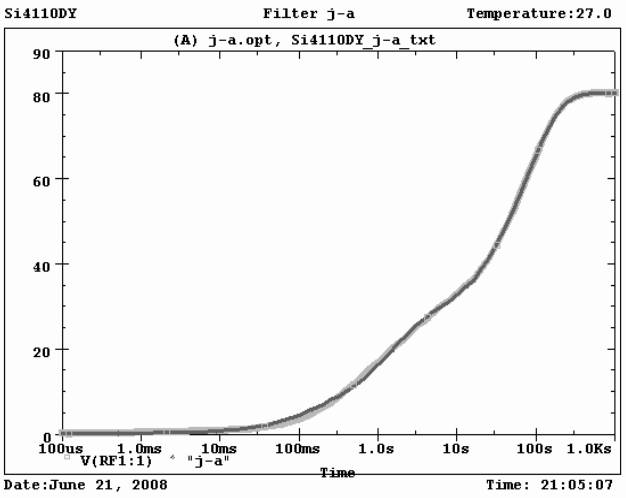
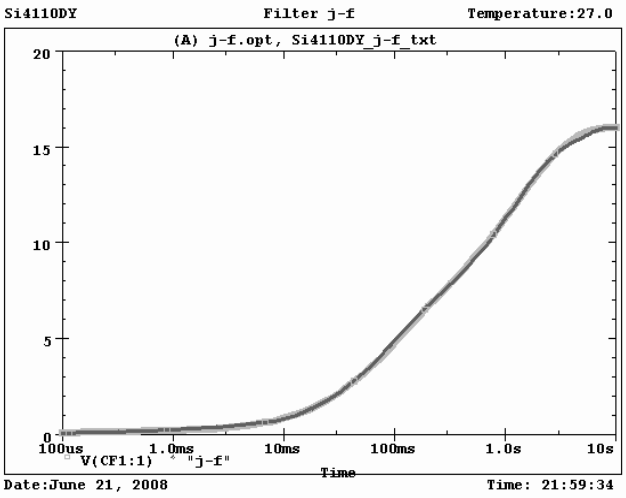
Time
Date:June 21, 2008
Time: 19:43:33


Si4110DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4110DY_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:June 21, 2008
Time: 21:05:07


Si4110DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4110DY_j-f_txt
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:June 21, 2008
Time: 21:59:34