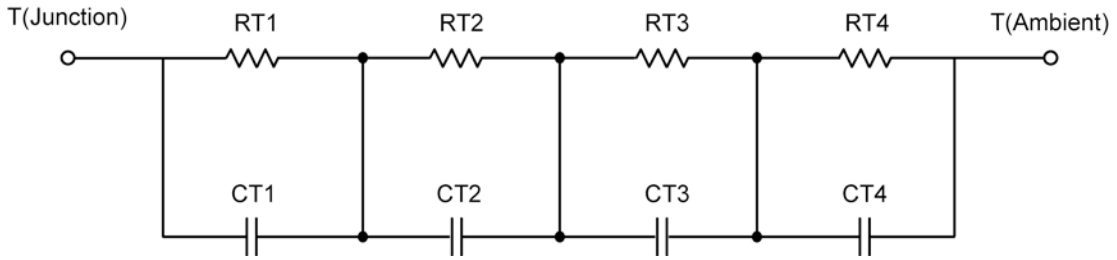
R-C Thermal Model Parameters

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."

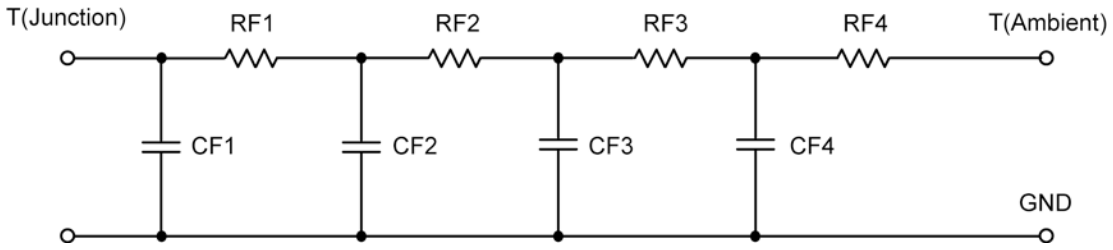
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	5.0905	N/A	3.0191
RT2	14.4386	N/A	5.1412
RT3	17.6629	N/A	11.9719
RT4	47.8080	N/A	1.8678
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.1909 m	N/A	33.6395 m
CT2	46.7780 m	N/A	20.2678 m
CT3	122.2311 m	N/A	107.1260 m
CT4	1.2643	N/A	2.2872 m

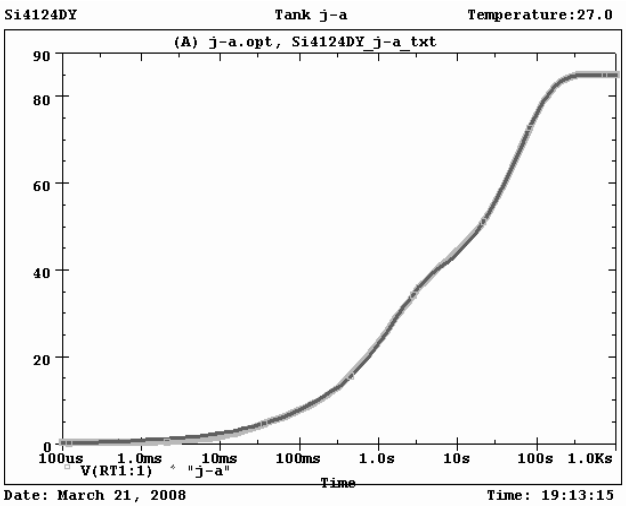
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

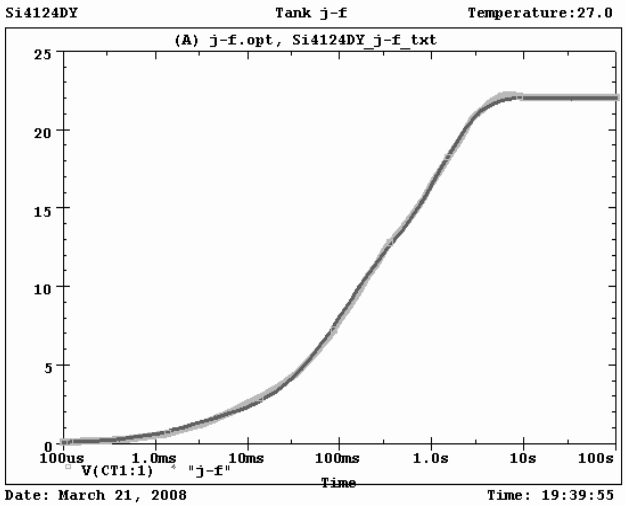
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.6606	N/A	2.3239
RF2	30.5481	N/A	7.8769
RF3	23.8575	N/A	7.9299
RF4	24.9338	N/A	3.8693
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.1640 m	N/A	1.9804 m
CF2	32.0791 m	N/A	7.3608 m
CF3	882.3015 m	N/A	62.2044 m
CF4	878.8849 m	N/A	199.8992 m

Note: NA indicates not applicable


Si4124DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4124DY_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: March 21, 2008
Time: 19:13:15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Tank j-f
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20
15
10
5
0
100us
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10ms
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1.0s
10s
100s
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Time
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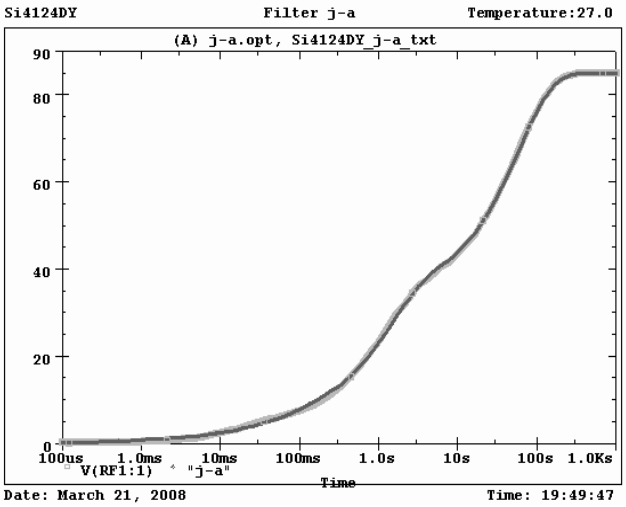
Si4124DY
Filter j-a
Temperature:27.0
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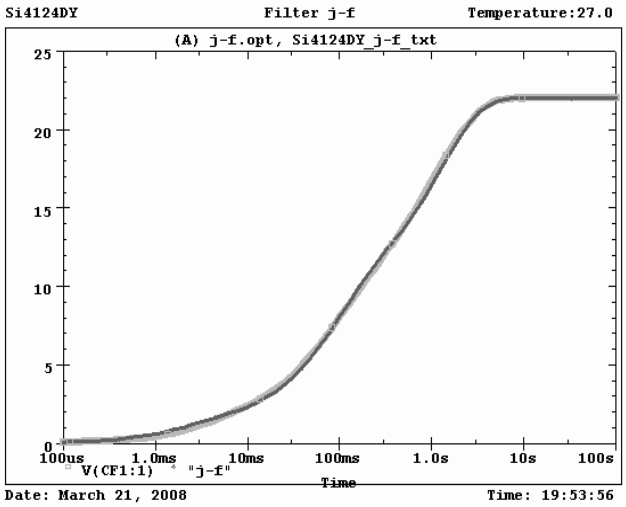
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 21, 2008
Time: 19:49:47


Si4124DY
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: March 21, 2008
Time: 19:53:56