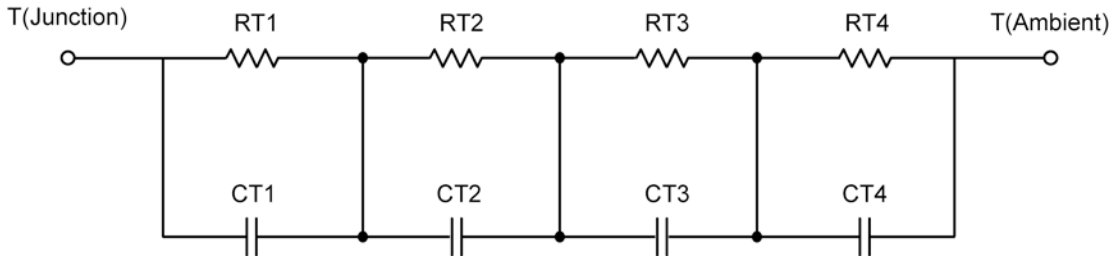
R-C Thermal Model Parameters

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."

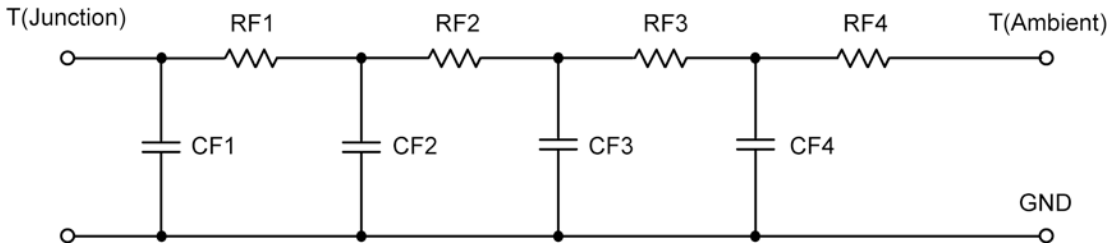
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.7553	N/A	11.1535
RT2	52.4724	N/A	2.1851
RT3	25.8042	N/A	7.0396
RT4	21.9681	N/A	19.6218
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	3.5356 m	N/A	8.5212 m
CT2	1.2614	N/A	566.4423 u
CT3	62.2281 m	N/A	10.5065 m
CT4	24.3414 m	N/A	43.8971 m

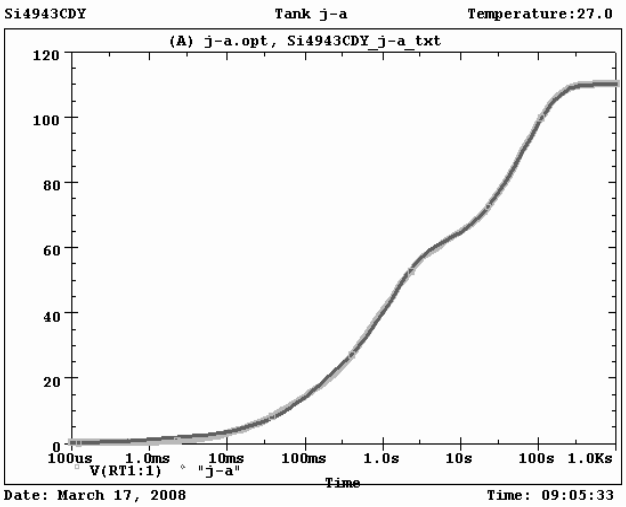
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

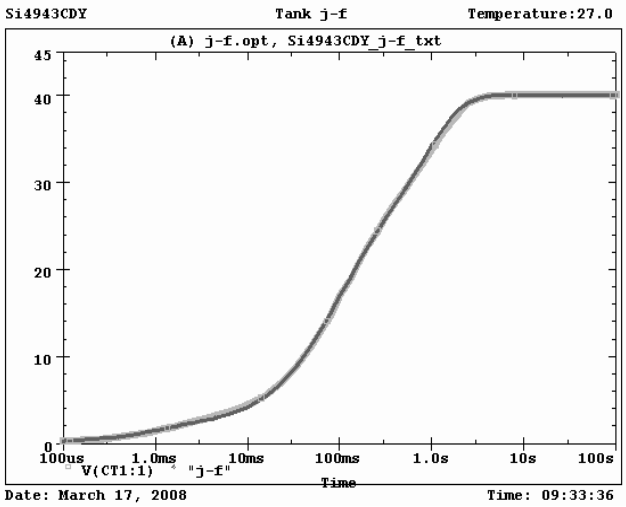
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.9593	N/A	3.3889
RF2	23.3267	N/A	17.8419
RF3	31.0539	N/A	7.1851
RF4	48.6601	N/A	11.5841
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.0809 m	N/A	935.0013 u
CF2	6.3968 m	N/A	3.0562 m
CF3	37.9288 m	N/A	18.2931 m
CF4	1.3866	N/A	39.5758 m

Note: NA indicates not applicable


Si4943CDY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4943CDY_j-a_txt
120
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: March 17, 2008
Time: 09:05:33


Si4943CDY
Tank j-f
Temperature:27.0
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45
40
30
20
10
0
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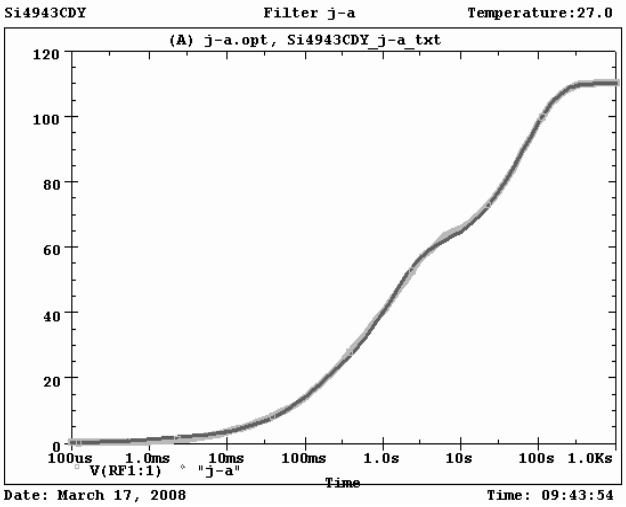
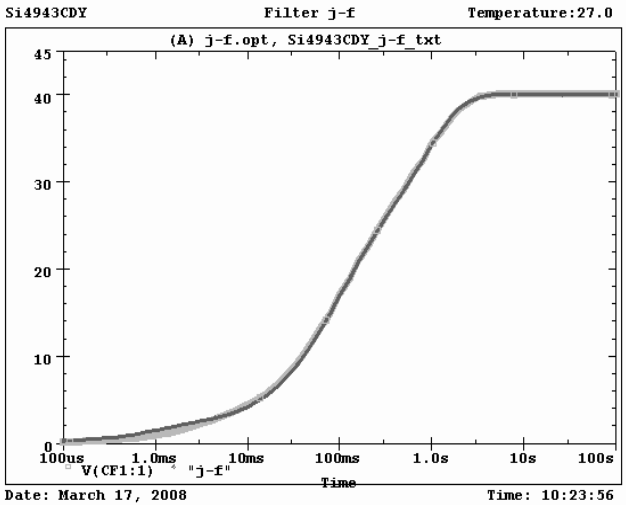
Time
Date: March 17, 2008
Time: 09:33:36


Si4943CDY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4943CDY_j-a_txt
120
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RF1:1) "j-a"
Time
Date: March 17, 2008
Time: 09:43:54


Si4943CDY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4943CDY_j-f_txt
45
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: March 17, 2008
Time: 10:23:56