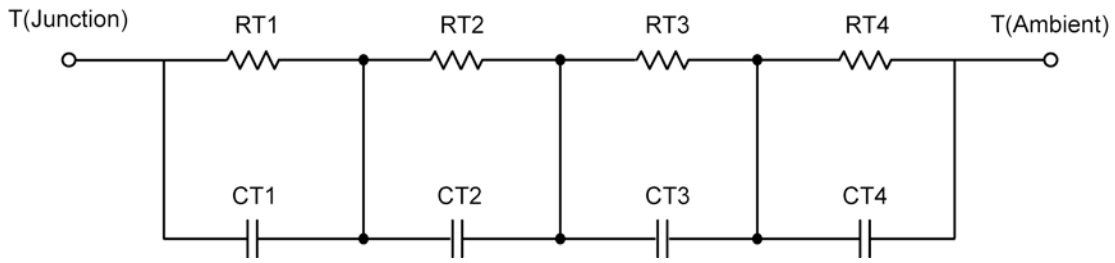
R-C Thermal Model Parameters

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."

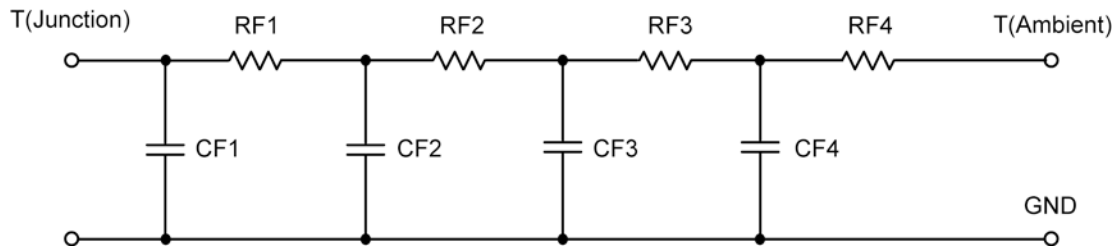
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.9521	N/A	3.0072
RT2	2.0391	N/A	5.1086
RT3	50.6042	N/A	11.7426
RT4	22.4046	N/A	1.1416
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	23.5238 m	N/A	37.0279 m
CT2	2.2547 m	N/A	17.9728 m
CT3	1.6397	N/A	119.0820 m
CT4	101.6106 m	N/A	1.4260 m

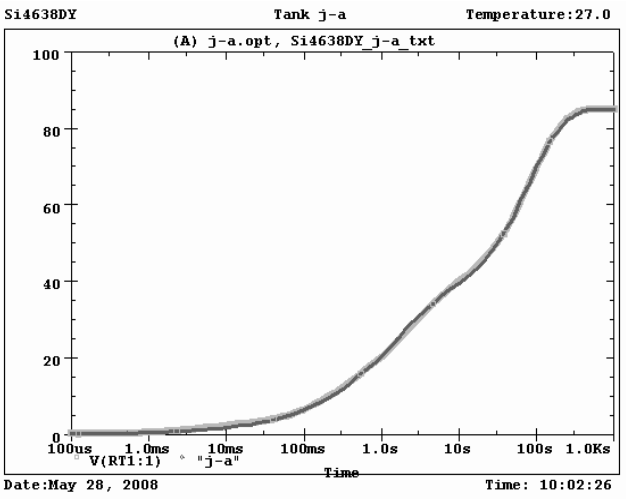
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	1.6630	N/A	1.7134
RF2	18.3605	N/A	9.2417
RF3	18.0648	N/A	6.3472
RF4	46.9117	N/A	3.6977
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.9063 m	N/A	1.4095 m
CF2	19.6849 m	N/A	11.4318 m
CF3	117.6042 m	N/A	119.4319 m
CF4	1.6582	N/A	16.4462 m

Note
NA indicates not applicable


Si4638DY
Tank j-a
Temperature:27.0
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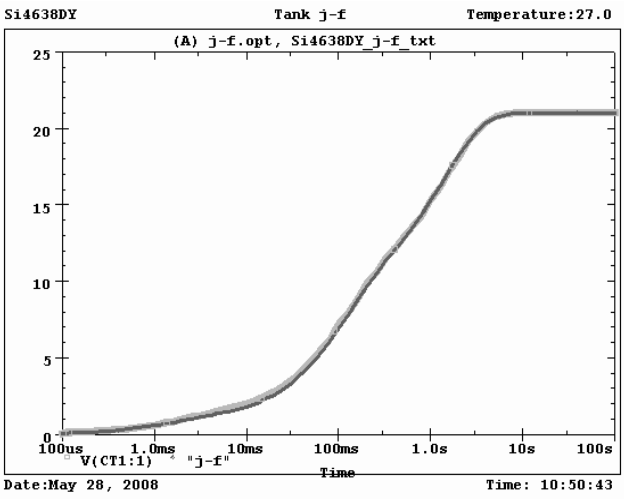
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date:May 28, 2008
Time: 10:02:26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Tank j-f
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20
15
10
5
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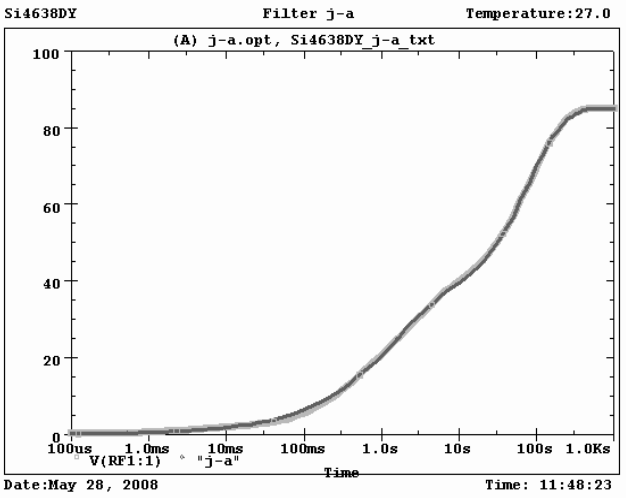
Si4638DY
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
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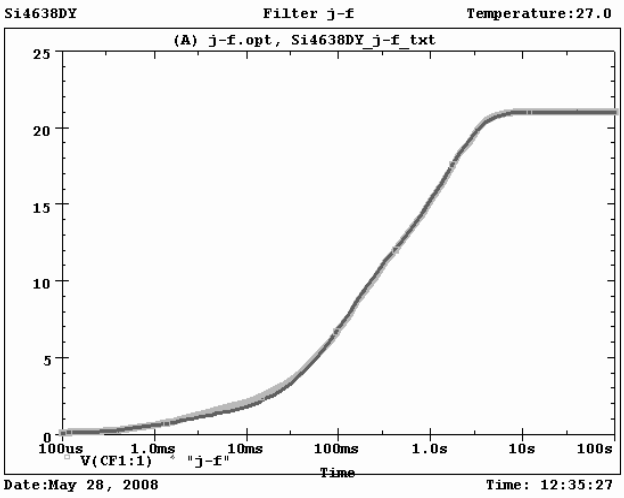
Time: 11:48:23


Si4638DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4638DY_j-f_txt
25
20
15
10
5
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date:May 28, 2008
Time: 12:35:27