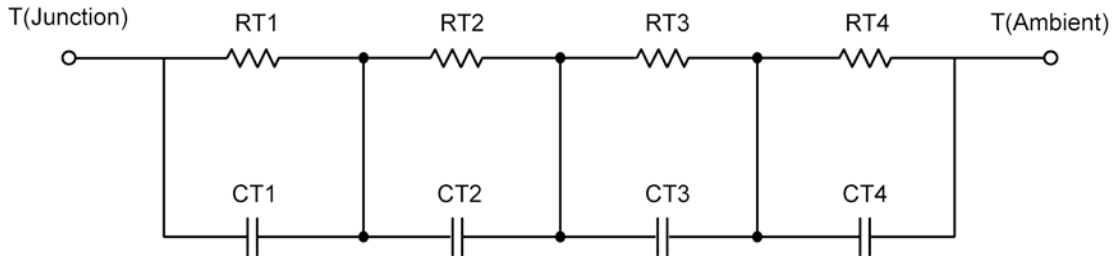
R-C Thermal Model Parameters

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."

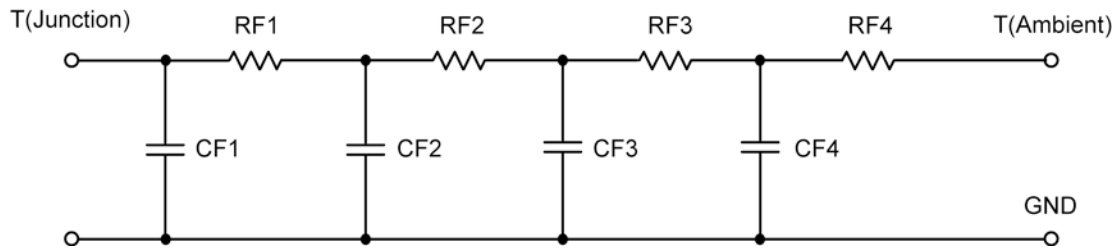
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.0854	N/A	1.5434
RT2	20.6899	N/A	7.7079
RT3	12.6955	N/A	5.0994
RT4	51.5292	N/A	5.6493
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	775.3827 u	N/A	579.5906 m
CT2	51.7235 m	N/A	5.1581 m
CT3	8.6161 m	N/A	11.8422 m
CT4	1.3271	N/A	881.3752 u

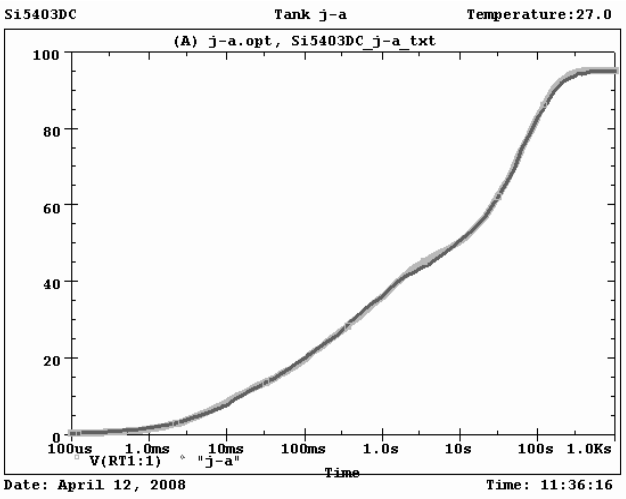
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

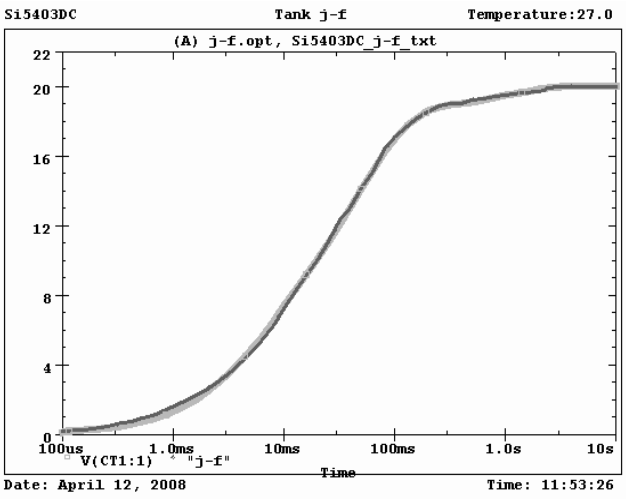
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.6157	N/A	7.6940
RF2	22.6463	N/A	5.9875
RF3	13.2087	N/A	4.9157
RF4	44.5293	N/A	1.4028
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	853.4877 u	N/A	668.5438 u
CF2	13.9259 m	N/A	3.0526 m
CF3	315.2069 m	N/A	904.5725 u
CF4	1.2613	N/A	535.0418 m

Note
NA indicates not applicable


Si5403DC
Tank j-a
Temperature:27.0
(A) j-a.opt, Si5403DC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: April 12, 2008
Time: 11:36:16


Si5403DC
Tank j-f
Temperature:27.0
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22
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
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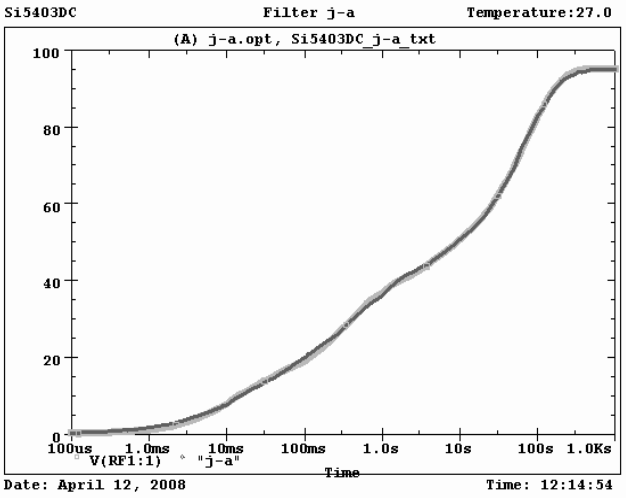
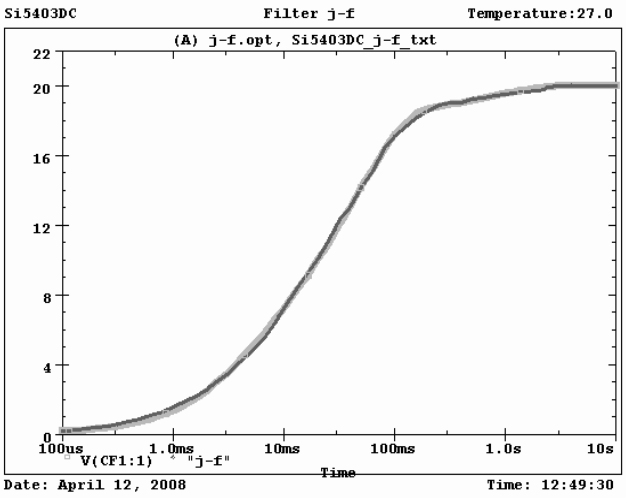
"j-f"
Time
Date: April 12, 2008
Time: 11:53:26


Si5403DC
Filter j-a
Temperature:27.0
(A) j-a.opt, Si5403DC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: April 12, 2008
Time: 12:14:54


Si5403DC
Filter j-f
Temperature:27.0
(A) j-f.opt, Si5403DC_j-f_txt
22
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date: April 12, 2008
Time: 12:49:30