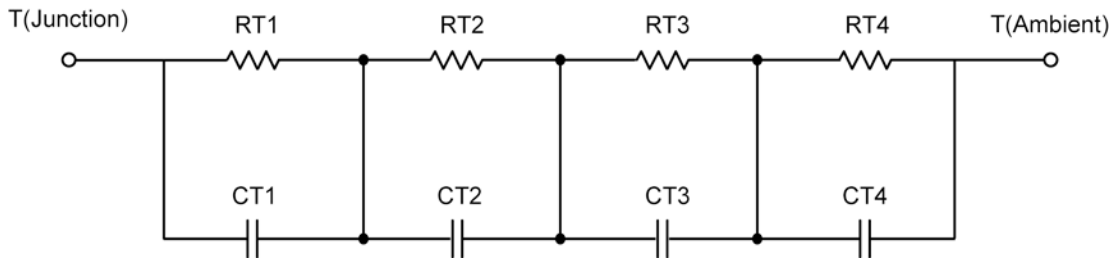
R-C Thermal Model Parameters

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."

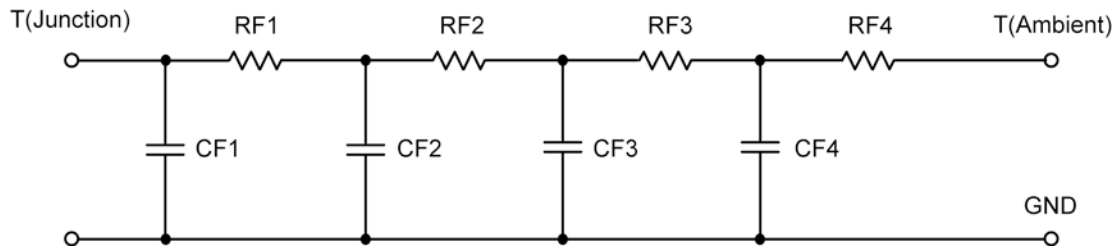
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.9056	N/A	4.6754
RT2	2.2056	N/A	6.1488
RT3	22.5686	N/A	4.9334
RT4	33.3202	N/A	242.4000 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3446	N/A	465.9197 m
CT2	16.8150 m	N/A	130.1461 m
CT3	46.0301 m	N/A	15.2189 m
CT4	2.7375	N/A	6.9607 m

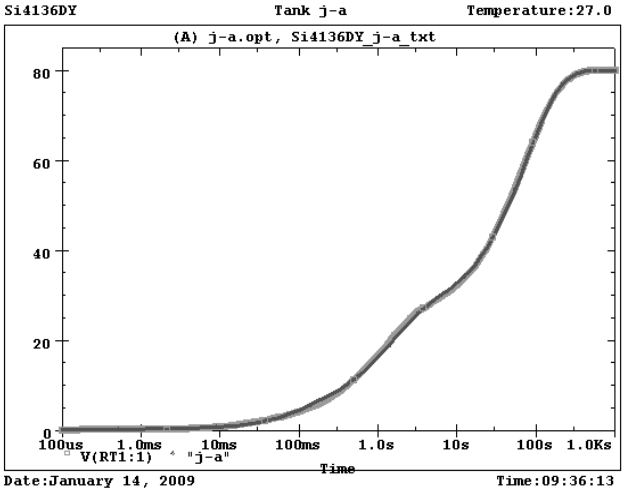
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

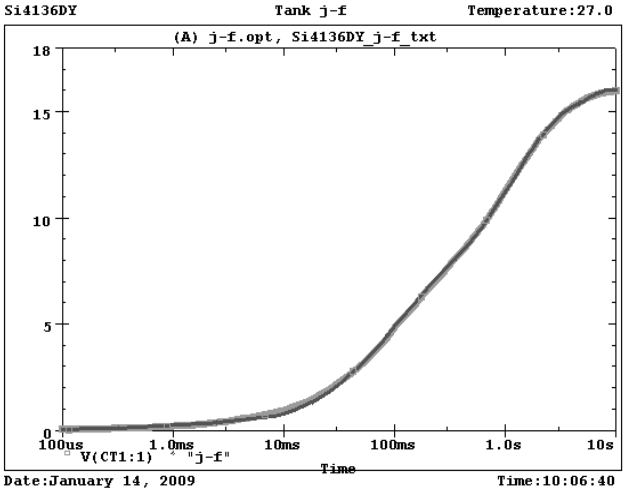
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.7760	N/A	518.6000 m
RF2	23.0248	N/A	6.4432
RF3	22.4643	N/A	7.3436
RF4	31.7349	N/A	1.6946
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	6.4882 m	N/A	4.0559 m
CF2	38.8278 m	N/A	10.1529 m
CF3	1.0017	N/A	115.5023 m
CF4	951.7442 m	N/A	804.3137 m

Note
NA indicates not applicable


Si4136DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4136DY_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:January 14, 2009
Time:09:36:13


Si4136DY
Tank j-f
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15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
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Time
Date:January 14, 2009
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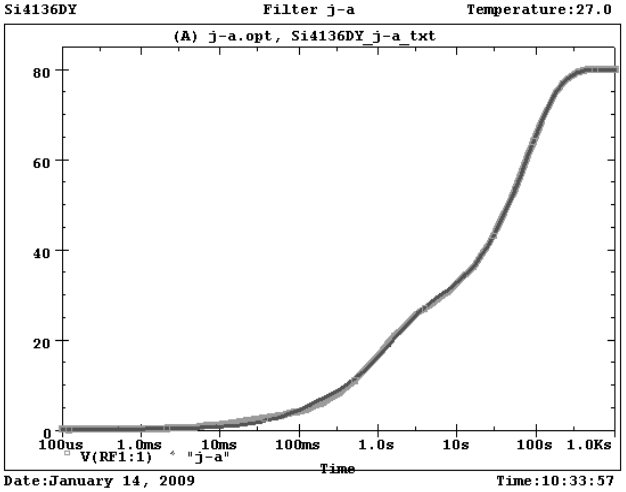
Si4136DY
Filter j-a
Temperature:27.0
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
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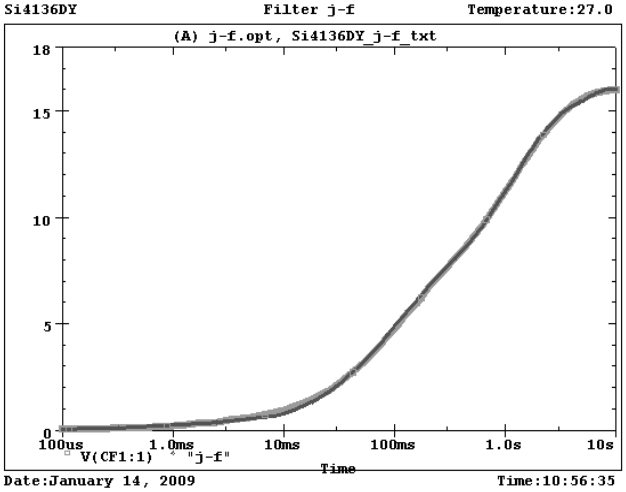
Time
Date:January 14, 2009
Time:10:33:57


Si4136DY
Filter j-f
Temperature:27.0
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18
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:January 14, 2009
Time:10:56:35