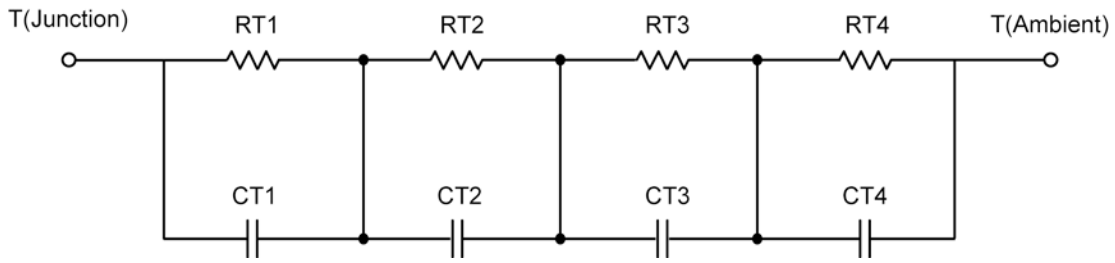
R-C Thermal Model Parameters

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."

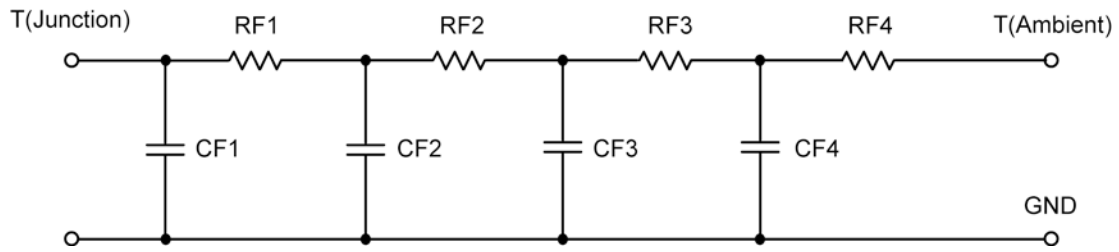
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.0881	N/A	2.6810
RT2	35.9372	N/A	14.3793
RT3	4.1351	N/A	1.6305
RT4	57.8396	N/A	19.3092
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.3739 m	N/A	390.0285 u
CT2	30.7787 m	N/A	5.0637 m
CT3	431.5246 u	N/A	6.2326 m
CT4	1.1805	N/A	50.6783 m

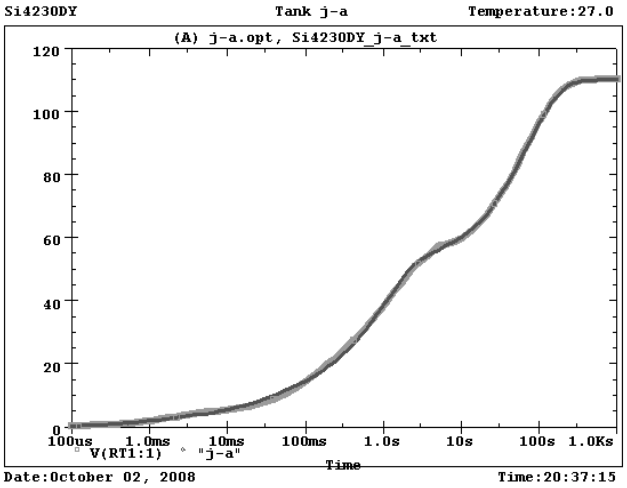
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

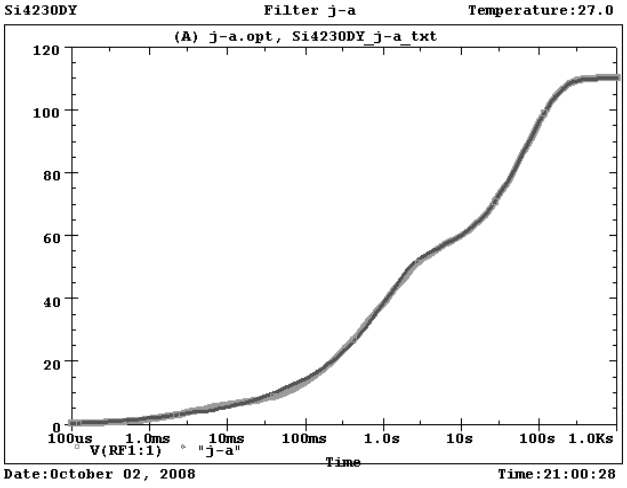
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.1264	N/A	5.7510
RF2	25.7462	N/A	16.7736
RF3	22.7566	N/A	10.4183
RF4	55.3708	N/A	5.0571
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	532.8324 u	N/A	588.3724 u
CF2	10.4322 m	N/A	4.7874 m
CF3	38.8282 m	N/A	55.7125 m
CF4	1.2145	N/A	58.4926 m

Note
NA indicates not applicable


Si4230DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4230DY_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:October 02, 2008
Time:20:37:15


Si4230DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4230DY_j-a_txt
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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Time
Date:October 02, 2008
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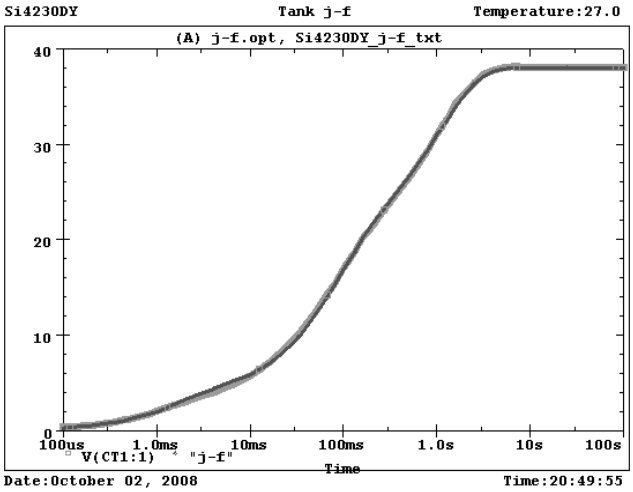
Si4230DY
Tank j-f
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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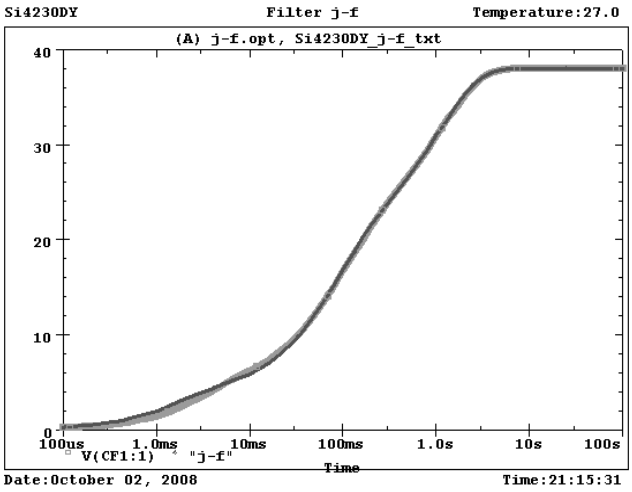
Time
Date:October 02, 2008
Time:20:49:55


Si4230DY
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date:October 02, 2008
Time:21:15:31