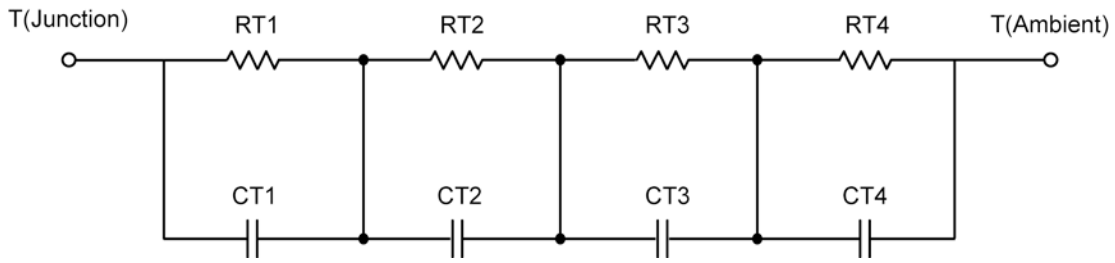
R-C Thermal Model Parameters

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."

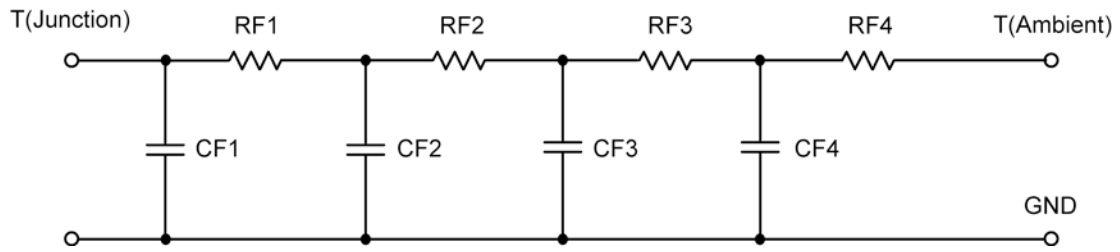
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.1698	N/A	5.5614
RT2	23.0213	N/A	21.5175
RT3	29.1321	N/A	4.5847
RT4	47.6768	N/A	6.3364
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	302.8012 u	N/A	1.8310 m
CT2	55.4643 m	N/A	3.5684 m
CT3	4.0123 m	N/A	93.5894 u
CT4	1.4844	N/A	2.5501 m

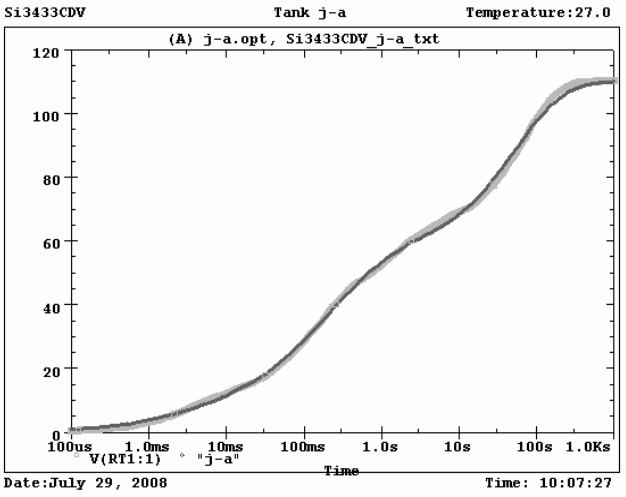
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.3928	N/A	5.7471
RF2	31.7669	N/A	18.0473
RF3	20.1954	N/A	12.5000
RF4	45.6449	N/A	1.7056
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	294.9757 u	N/A	88.4623 u
CF2	3.7227 m	N/A	827.1072 u
CF3	66.2577 m	N/A	3.2159 m
CF4	1.4759	N/A	419.2380 m

Note
NA indicates not applicable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Tank j-a
Temperature:27.0
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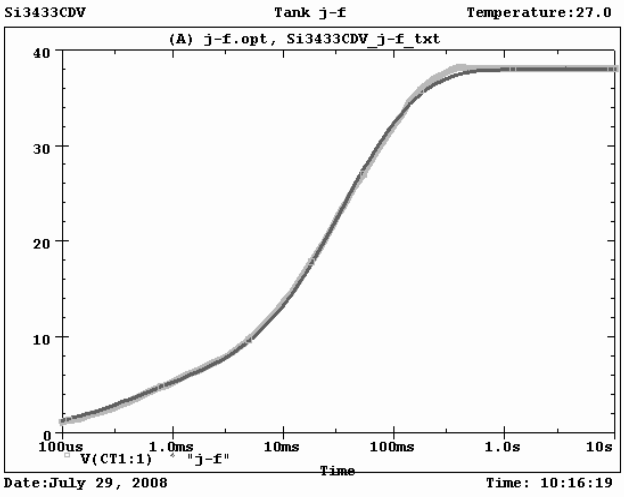
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:July 29, 2008
Time: 10:07:27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Tank j-f
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30
20
10
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100us
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10ms
100ms
1.0s
10s
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Time
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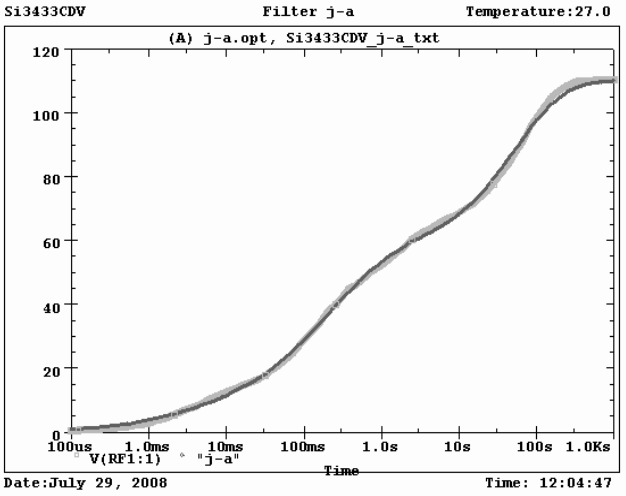
Si3433CDV
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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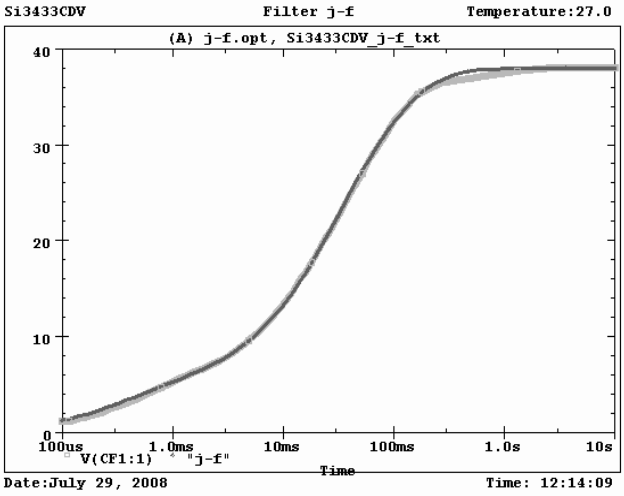
Time
Date:July 29, 2008
Time: 12:04:47


Si3433CDV
Filter j-f
Temperature:27.0
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:July 29, 2008
Time: 12:14:09