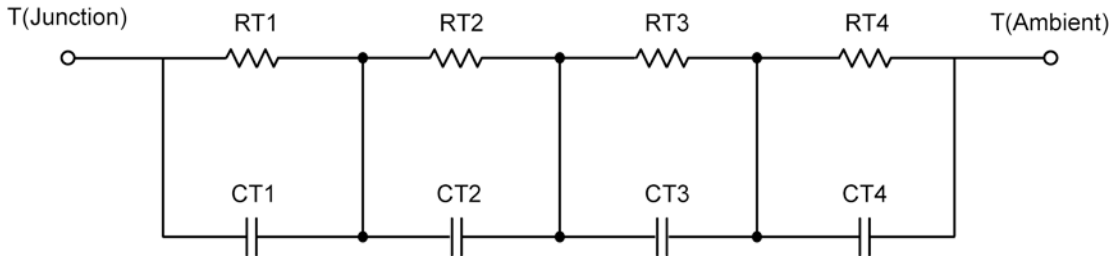
R-C Thermal Model Parameters

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."

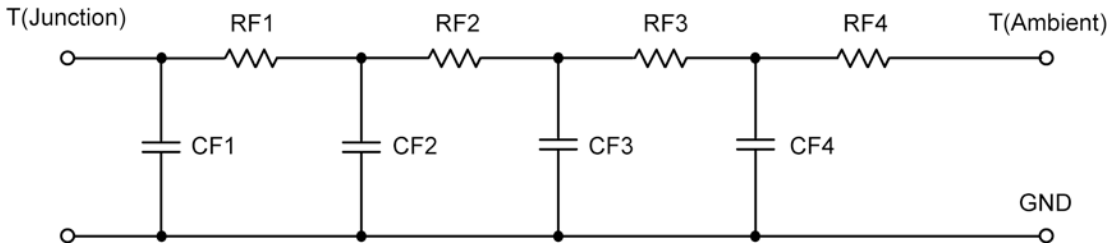
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	46.7875	N/A	10.5713
RT2	37.5846	N/A	31.8185
RT3	13.9854	N/A	5.9736
RT4	46.6425	N/A	36.6366
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.8546 m	N/A	77.6141 m
CT2	117.6668 m	N/A	1.9887 m
CT3	860.5520 u	N/A	178.4826 u
CT4	1.7457	N/A	3.2969 m

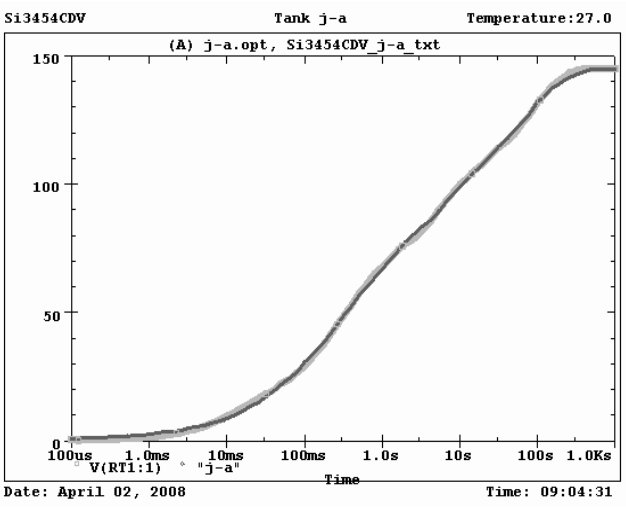
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.5861	N/A	9.0828
RF2	46.3903	N/A	56.9547
RF3	37.4255	N/A	8.1240
RF4	42.5981	N/A	10.8385
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	785.9543 u	N/A	196.2349 u
CF2	5.0603 m	N/A	1.0830 m
CF3	105.7208 m	N/A	2.4109 m
CF4	1.7342	N/A	43.4669 m

Note: NA indicates not applicable


Si3454CDV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3454CDV_j-a_txt
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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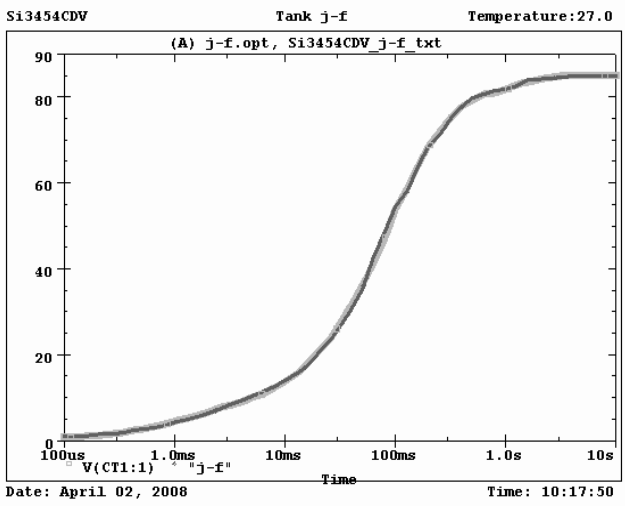
Time
Date: April 02, 2008
Time: 09:04:31


Si3454CDV
Tank j-f
Temperature:27.0
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90
80
60
40
20
0
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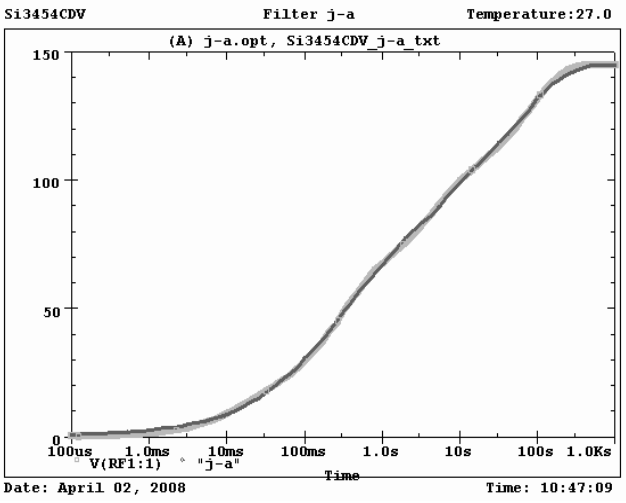
Si3454CDV
Filter j-a
Temperature:27.0
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100
50
0
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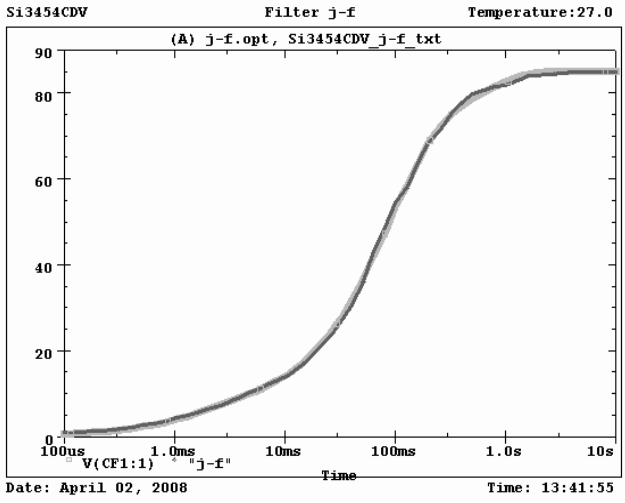
Time: 10:47:09


Si3454CDV
Filter j-f
Temperature:27.0
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90
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s
V(CF1:1) "j-f"
Time
Date: April 02, 2008
Time: 13:41:55