

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	26.5125	N/A	4.6684
RT2	14.9941	N/A	22.0431
RT3	9.0749	N/A	3.9097
RT4	59.4185	N/A	9.3788
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	18.4220 m	N/A	3.5783 m
CT2	102.9627 m	N/A	34.0146 m
CT3	912.1963 u	N/A	198.4865 u
CT4	1.2425	N/A	8.0917 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**

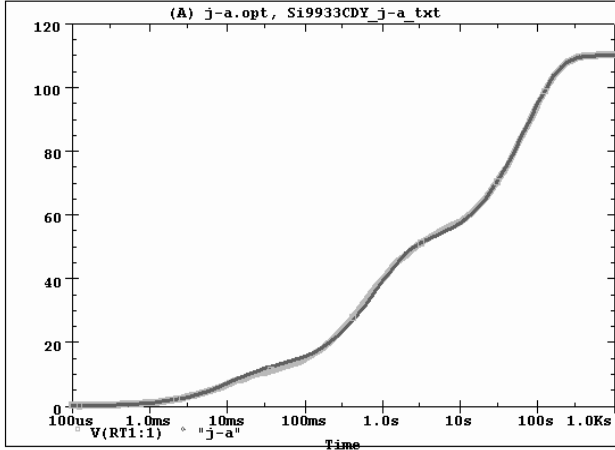
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)			
Junction to	Ambient	Case	Foot
RF1	10.7031	N/A	4.9115
RF2	30.1073	N/A	8.1603
RF3	13.3349	N/A	12.1881
RF4	55.8547	N/A	14.7401
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	846.6296 μ	N/A	206.5614 μ
CF2	14.3591 m	N/A	2.4082 m
CF3	102.0943 m	N/A	6.2057 m
CF4	1.2065	N/A	47.1862 m

Note

NA indicates not applicable

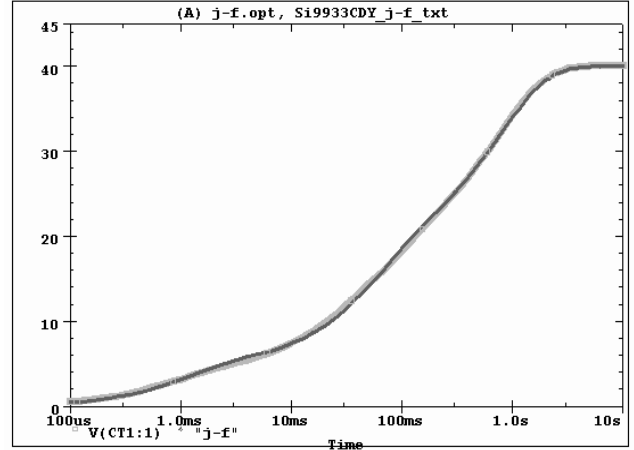


Si9933CDY Tank j-a Temperature:27.0



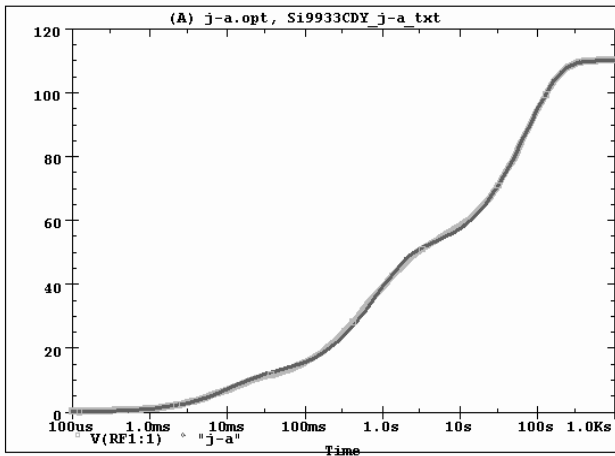
Date:July 01, 2008 Time: 19:32:14

Si9933CDY Tank j-f Temperature:27.0



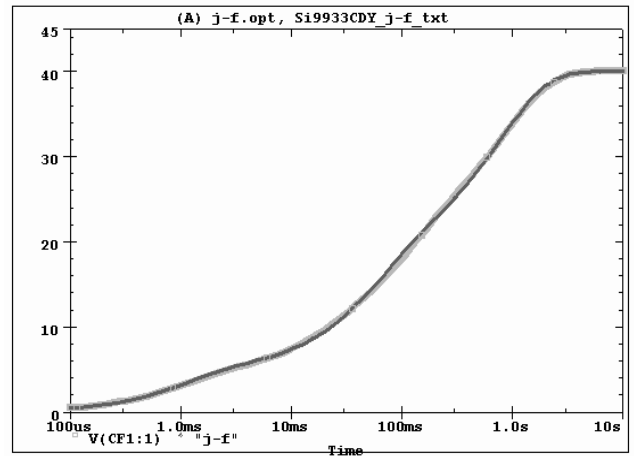
Date:July 01, 2008 Time: 19:49:09

Si9933CDY Filter j-a Temperature:27.0



Date:July 01, 2008 Time: 19:59:37

Si9933CDY Filter j-f Temperature:27.0



Date:July 01, 2008 Time: 20:16:07