

## 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



<b>R-C VALUES FOR TANK CONFIGURATION</b>			
<b>Thermal Resistance (°C/W)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
RT1	24.7202	17.0285	N/A
RT2	36.0217	10.9462	N/A
RT3	32.5543	302.0000 m	N/A
RT4	31.7038	11.7233 m	N/A
<b>Thermal Capacitance (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	33.8005 u	236.4599 u	N/A
CT2	730.9573 m	575.8540 u	N/A
CT3	480.9535 u	677.7926 m	N/A
CT4	7.2586 m	41.2419 u	N/A

*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**

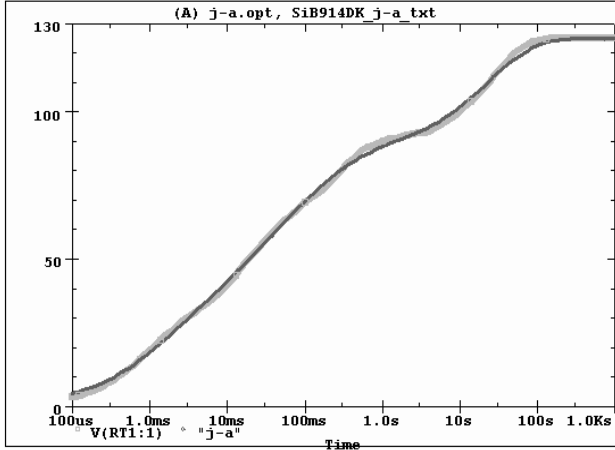
Thermal Resistance ( $^{\circ}\text{C}/\text{W}$ )			
Junction to	Ambient	Case	Foot
RF1	32.5774	14.8268	N/A
RF2	36.3650	19.3796	N/A
RF3	21.9662	5.6687	N/A
RF4	34.0914	124.9000 m	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	36.0236 u	29.3109 u	N/A
CF2	734.2795 u	123.6870 u	N/A
CF3	15.7342 m	813.3045 u	N/A
CF4	790.0923 m	278.1963 u	N/A

**Note**

NA indicates not applicable

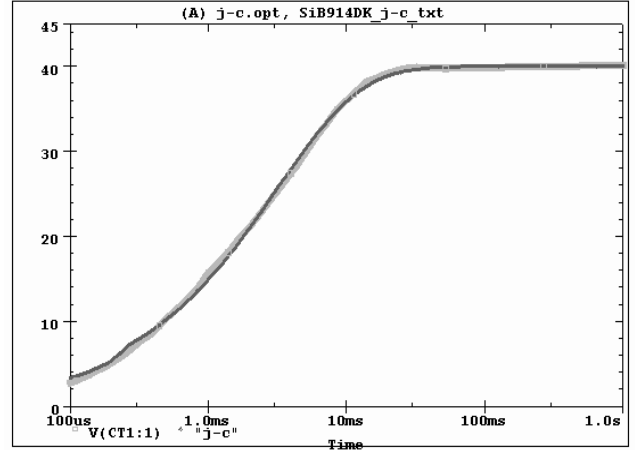


SiB914DK Tank j-a Temperature:27.0



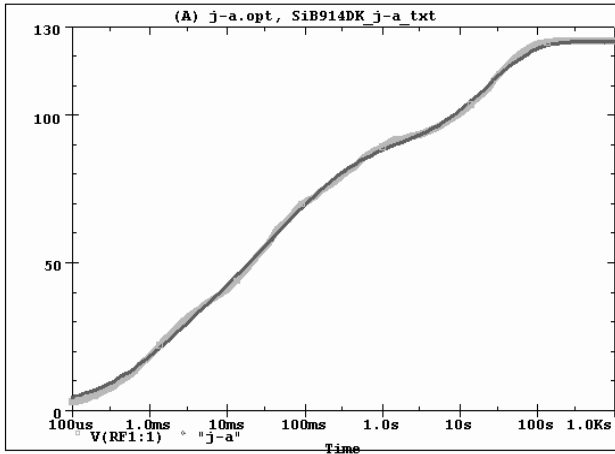
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SiB914DK Tank j-c Temperature:27.0



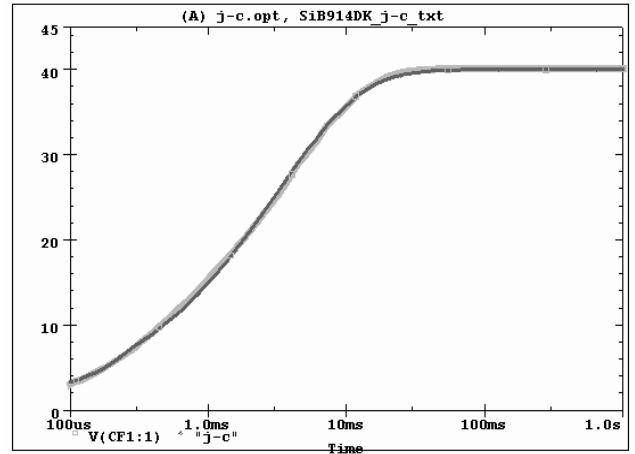
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SiB914DK Filter j-a Temperature:27.0



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SiB914DK Filter j-c Temperature:27.0



Date:July 01, 2008 Time: 19:01:25