

## 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	12.4956	764.1000 m	N/A
RT2	27.7856	5.6063	N/A
RT3	26.5938	5.7425	N/A
RT4	43.1250	3.8871	N/A
<b>Thermal Capacitance (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	90.5372 u	5.0483 m	N/A
CT2	1.9922 m	452.2021 u	N/A
CT3	34.1193 m	54.4164 u	N/A
CT4	1.1119	486.1773 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**

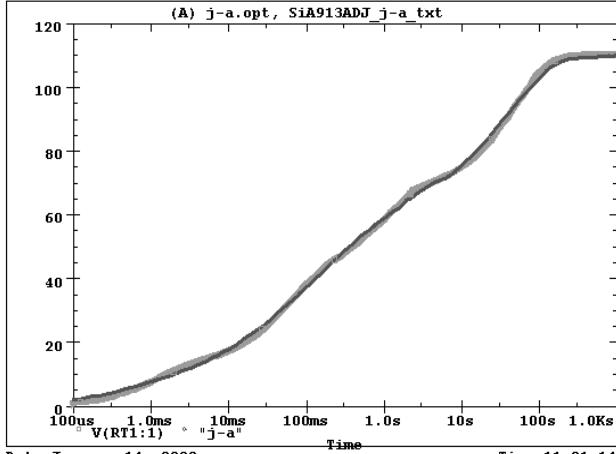
Thermal Resistance ( $^{\circ}\text{C}/\text{W}$ )			
Junction to	Ambient	Case	Foot
RF1	14.2316	8.6635	N/A
RF2	31.2018	4.0091	N/A
RF3	23.4768	1.6771	N/A
RF4	41.0898	1.6503	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	92.1040 u	43.9117 u	N/A
CF2	2.0224 m	226.4934 u	N/A
CF3	41.6061 m	229.4698 u	N/A
CF4	1.1219	103.4306 u	N/A

**Note**

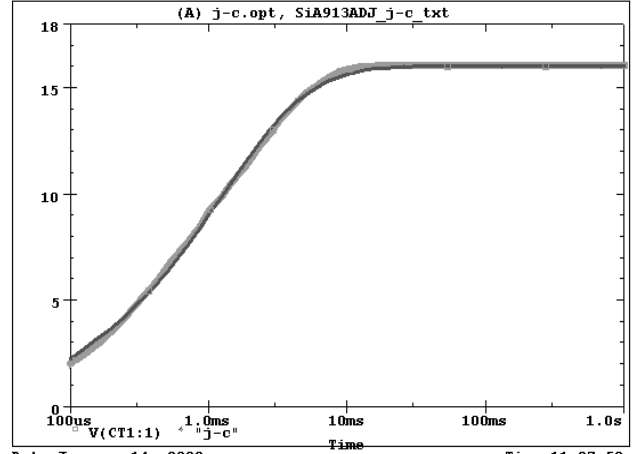
NA indicates not applicable



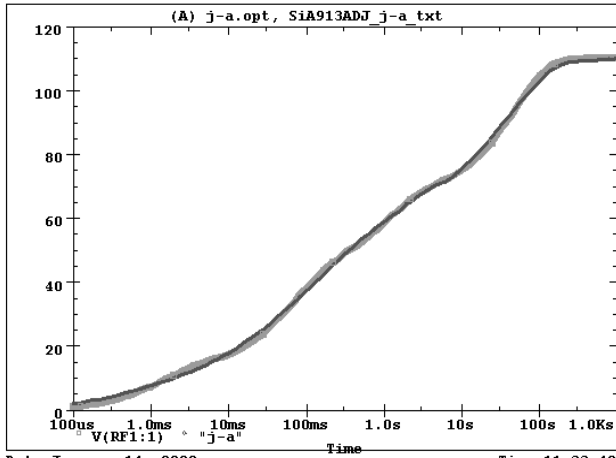
SiA913ADJ Tank j-a Temperature:27.0



SiA913ADJ Tank j-c Temperature:27.0



SiA913ADJ Filter j-a Temperature:27.0



SiA913ADJ Filter j-c Temperature:27.0

