

## 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	4.4488	N/A	13.0961
RT2	22.8491	N/A	13.0363
RT3	27.7517	N/A	3.6375
RT4	54.9504	N/A	10.2301
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	818.8439 u	N/A	98.1401 m
CT2	6.6453 m	N/A	10.1767 m
CT3	70.4576 m	N/A	463.7635 u
CT4	1.3397	N/A	4.9795 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**

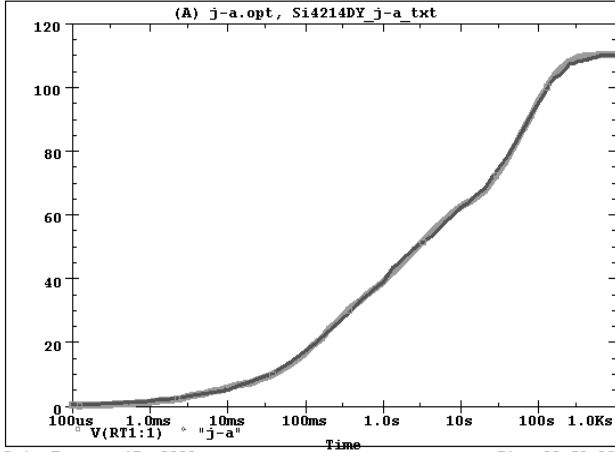
Thermal Resistance ( $^{\circ}\text{C}/\text{W}$ )			
Junction to	Ambient	Case	Foot
RF1	6.3989	N/A	4.1691
RF2	26.6531	N/A	18.1122
RF3	25.8296	N/A	11.5807
RF4	51.1184	N/A	6.1380
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	579.7231 $\mu$	N/A	367.5929 $\mu$
CF2	6.3894 m	N/A	2.5942 m
CF3	77.5667 m	N/A	20.8570 m
CF4	1.3789	N/A	266.6853 m

**Note**

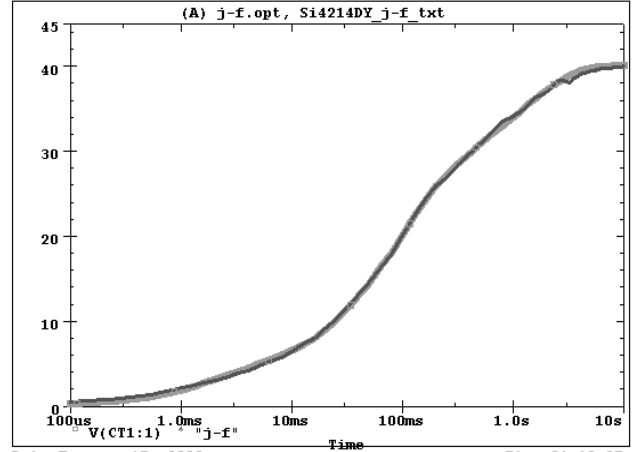
NA indicates not applicable



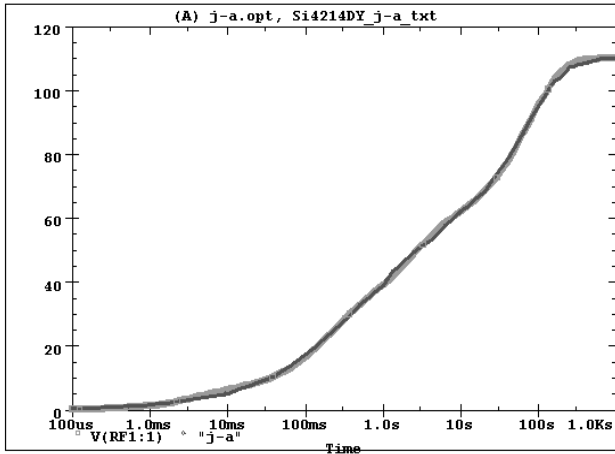
Si4214DY Tank j-a Temperature:27.0



Si4214DY Tank j-f Temperature:27.0



Si4214DY Filter j-a Temperature:27.0



Si4214DY Filter j-f Temperature:27.0

