

R-C Thermal Model Parameters

DESCRIPTION

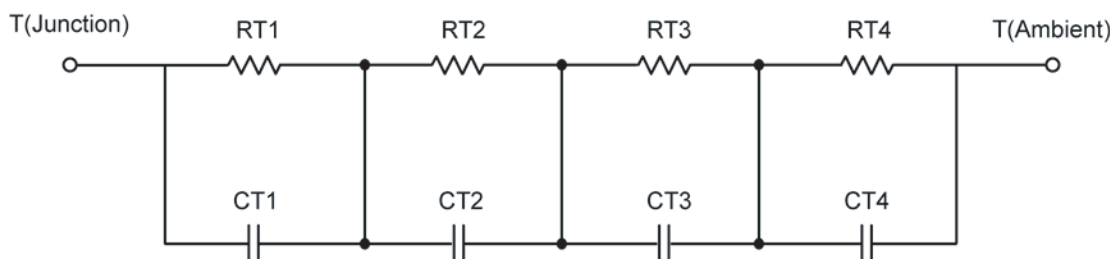
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

Note:

For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on 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	4.5197	362.3679 u	N/A
RT2	7.4284	504.3467 m	N/A
RT3	11.8825	972.1139 m	N/A
RT4	56.6379	937.1926 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	6.7430 m	1.9260 m	N/A
CT2	32.7582 m	787.5516 u	N/A
CT3	109.4727 m	18.2079 m	N/A
CT4	1.1804	9.3126 m	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	7.8647	1.8142 m	N/A
RF2	9.3907	670.9463 m	N/A
RF3	10.7274	1.0320	N/A
RF4	52.6417	691.0146 m	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	6.1206 m	125.4667 u	N/A
CF2	24.0557 m	695.7232 u	N/A
CF3	148.5836 m	6.0783 m	N/A
CF4	1.1181	527.9622 u	N/A

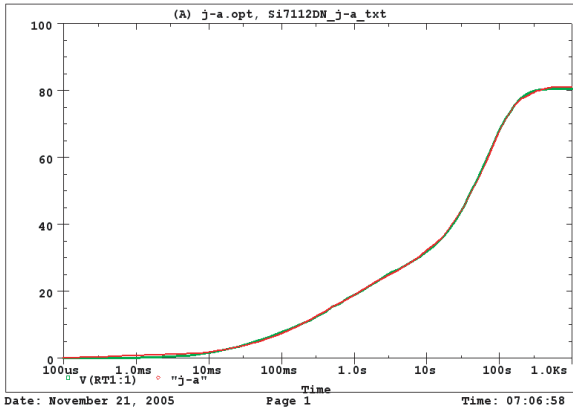
Note: NA indicates not applicable

Reference:

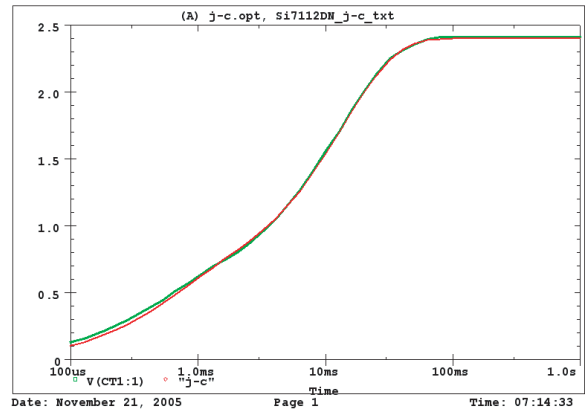
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002



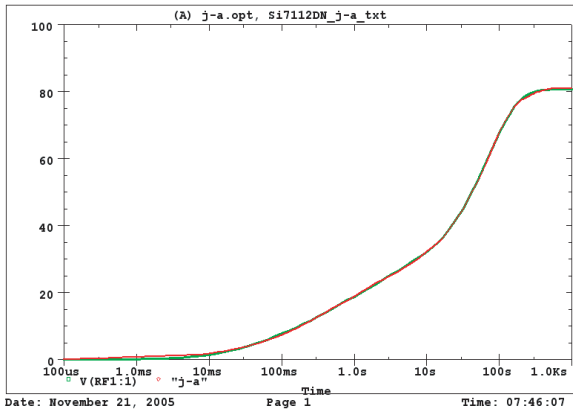
Si7112DN Tank j-a Temperature: 27.0



Si7112DN Tank j-c Temperature: 27.0



Si7112DN Filter j-a Temperature: 27.0



Si7112DN Filter j-c Temperature: 27.0

