

## R-C Thermal Model Parameters

### DESCRIPTION

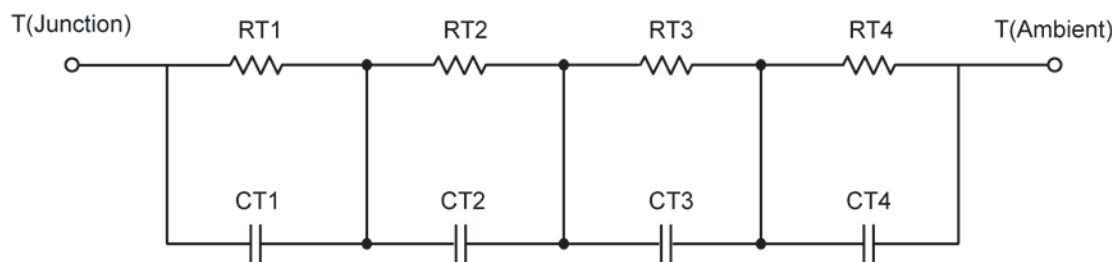
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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



<b>R-C VALUES FOR TANK CONFIGURATION</b>			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	2.0963	2.3554 m	N/A
RT2	9.0488	690.6627 m	N/A
RT3	8.0177	1.6922	N/A
RT4	50.6165	820.2806 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	24.2344 m	136.5785 u	N/A
CT2	558.7573 m	595.8486 u	N/A
CT3	70.7495 m	9.9128 m	N/A
CT4	1.4435	8.8712 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	5.3871	657.3010 u	N/A
RF2	10.2337	1.0857	N/A
RF3	17.6421	1.1764	N/A
RF4	36.7131	935.2605 m	N/A
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )			
Junction to	Ambient	Case	Foot
CF1	15.7961 m	388.4781 u	N/A
CF2	98.5875 m	322.0178 u	N/A
CF3	538.0285 m	5.2085 m	N/A
CF4	1.3275	2.4604 m	N/A

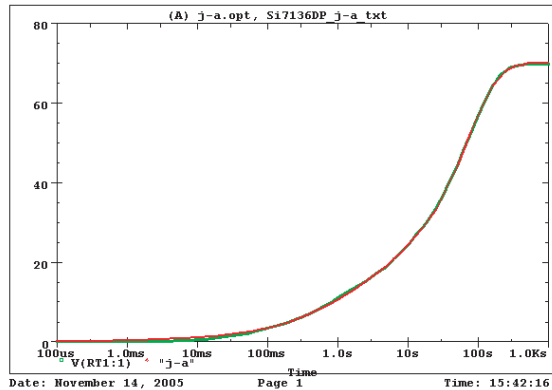
Note: NA indicates not applicable

Reference:

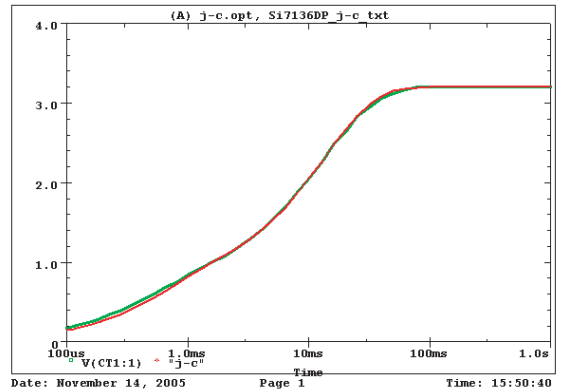
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002



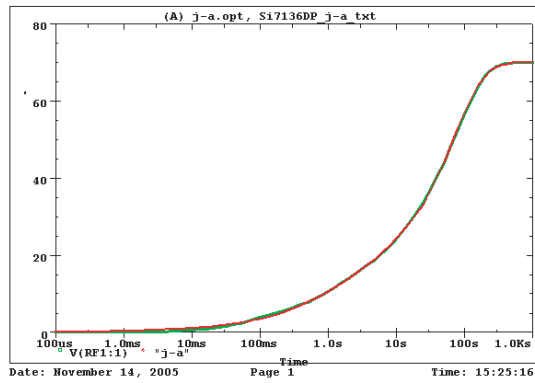
Si7136DP Tank j-a Temperature: 27.0



Si7136DP Tank j-c Temperature: 27.0



Si7136DP Filter j-a Temperature: 27.0



Si7136DP Filter j-c Temperature: 27.0

