

R-C Thermal Model Parameters

DESCRIPTION

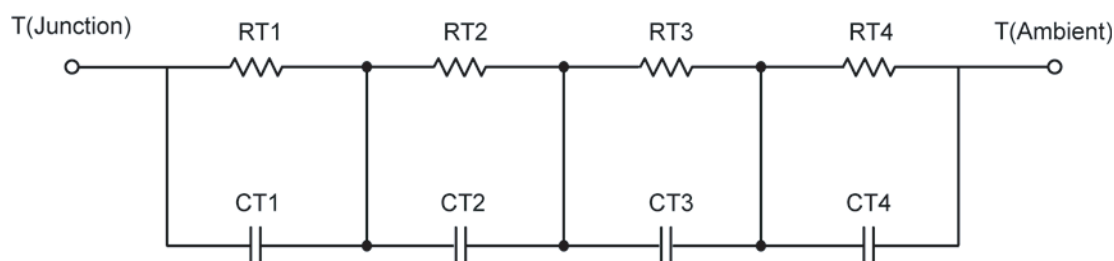
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

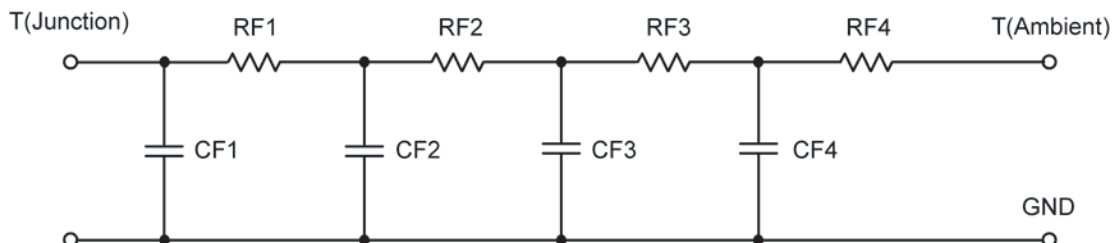
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	18.2541	N/A	2.1100
RT2	10.9042	N/A	7.0820
RT3	3.5072	N/A	6.8889
RT4	52.6116	N/A	8.9502
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	111.3046 m	N/A	3.0125 m
CT2	27.1060 m	N/A	46.5361 m
CT3	1.3344 m	N/A	147.3208 m
CT4	1.4981	N/A	5.2600 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	4.4215	N/A	4.5957
RF2	14.6812	N/A	9.0439
RF3	16.7383	N/A	9.6950
RF4	49.4280	N/A	1.7639
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	1.6090 m	N/A	1.5450 m
CF2	21.8444 m	N/A	3.9761 m
CF3	91.2122 m	N/A	39.6644 m
CF4	1.4926	N/A	733.7564 m

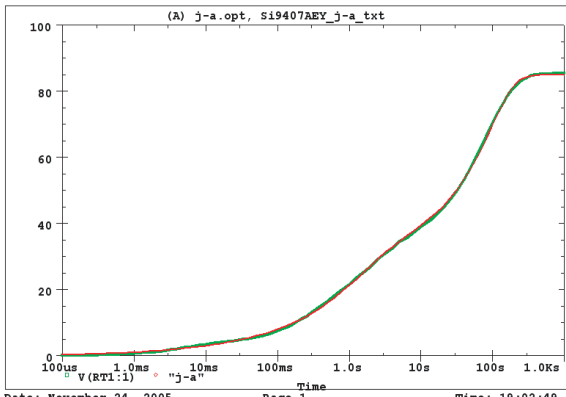
Note: NA indicates not applicable

Reference:

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

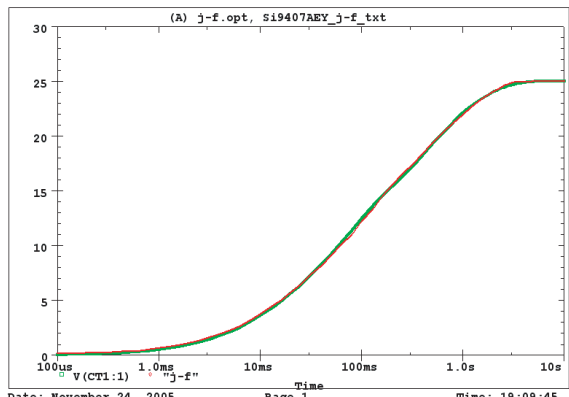


Si9407AEY Tank j-a Temperature: 27.0



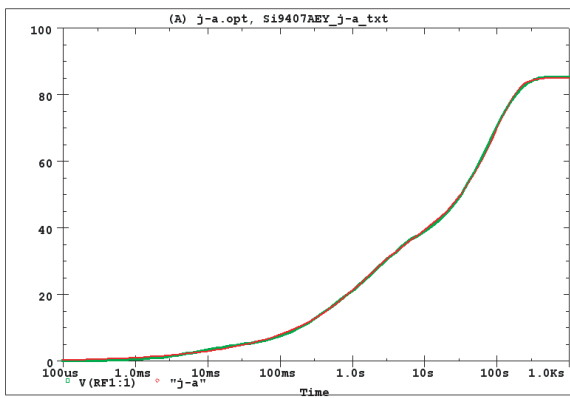
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Si9407AEY Tank j-f Temperature: 27.0



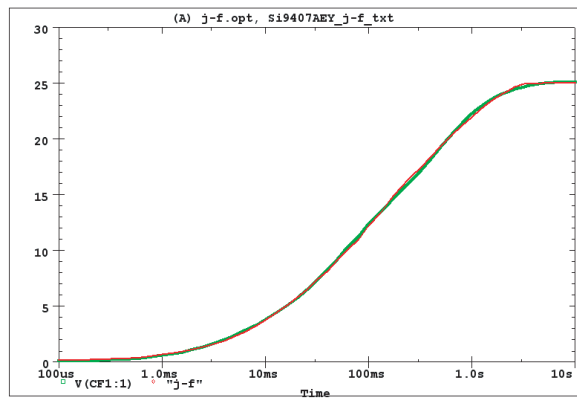
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Si9407AEY Filter j-a Temperature: 27.0



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Si9407AEY Filter j-c Temperature: 27.0



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