

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-Mosfet	Case-Mosfet	Ambient-Schtky	Case-Schtky
RT1	25.8101	1.3523	25.8101	1.3523
RT2	12.2296	5.6589	12.2296	5.6589
RT3	27.8919	5.0019	27.8919	5.0019
RT4	44.0684	3.9869	44.0684	3.9869
Thermal Capacitance (Joules/°C)				
Junction to	Ambient-Mosfet	Case-Mosfet	Ambient-Schtky	Case-Schtky
CT1	1.8429 m	1.0155 m	1.8429 m	1.0155 m
CT2	90.4532 u	564.8306 u	90.4532 u	564.8306 u
CT3	27.4483 m	55.9280 u	27.4483 m	55.9280 u
CT4	1.0617	357.4204 u	1.0617	357.4204 u

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

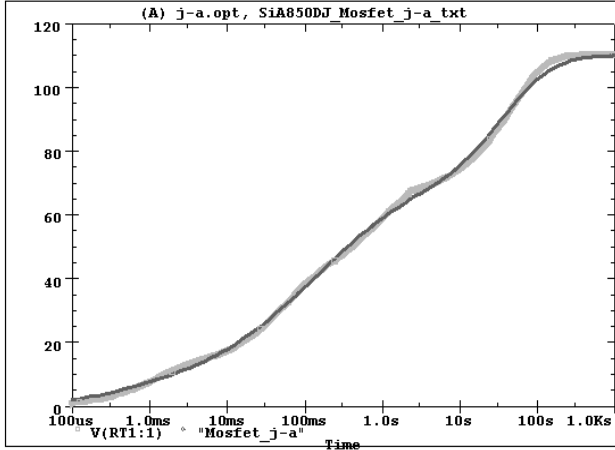
R-C VALUES FOR FILTER CONFIGURATION				
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)				
Junction to	Ambient-Mosfet	Case-Mosfet	Ambient-Schtky	Case-Schtky
RF1	14.2316	6.6789	14.2316	6.6789
RF2	31.2017	4.9199	31.2017	4.9199
RF3	23.4768	2.7079	23.4768	2.7079
RF4	41.0899	1.6933	41.0899	1.6933
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)				
Junction to	Ambient-Mosfet	Case-Mosfet	Ambient-Schtky	Case-Schtky
CF1	92.0097 u	37.0761 u	92.0097 u	37.0761 u
CF2	2.0230 m	118.4691 u	2.0230 m	118.4691 u
CF3	43.4126 m	211.8647 u	43.4126 m	211.8647 u
CF4	1.1315	980.4259 u	1.1315	980.4259 u

Note

NA indicates not applicable



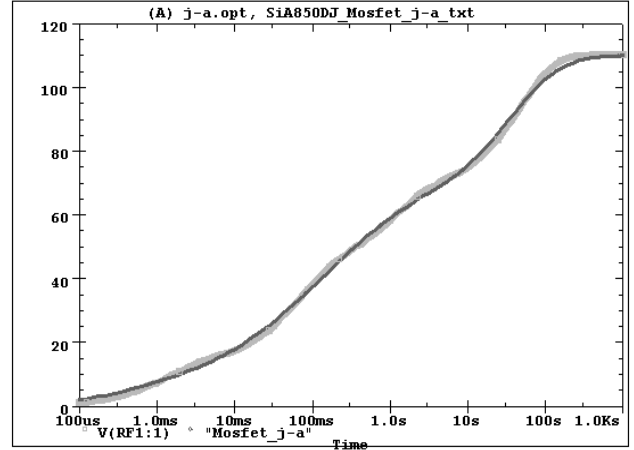
SiA850DJ Tank j-a Mosfet Temperature:27.0



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Time: 10:14:34

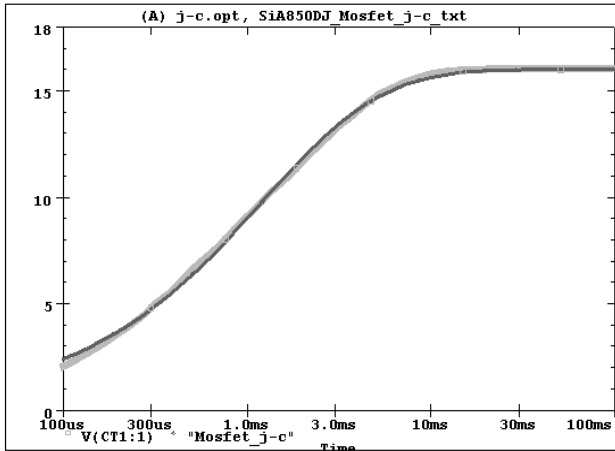
SiA850DJ Filter j-a Mosfet Temperature:27.0



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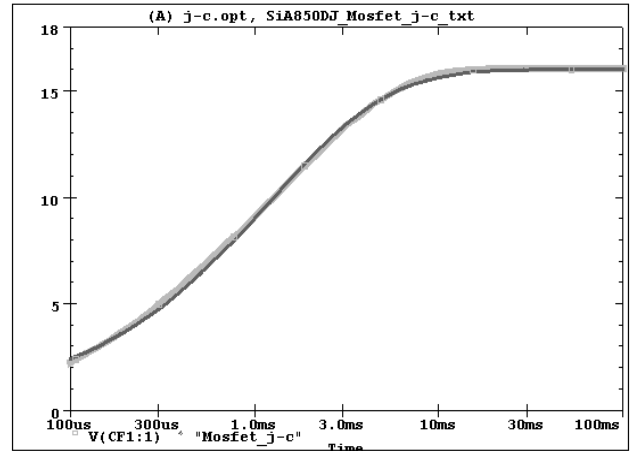
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Date:August 11, 2008

Time: 10:36:10

SiA850DJ Filter j-c Mosfet Temperature:27.0

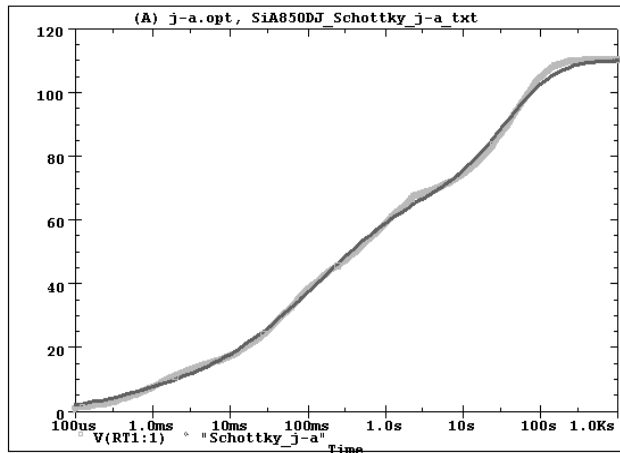


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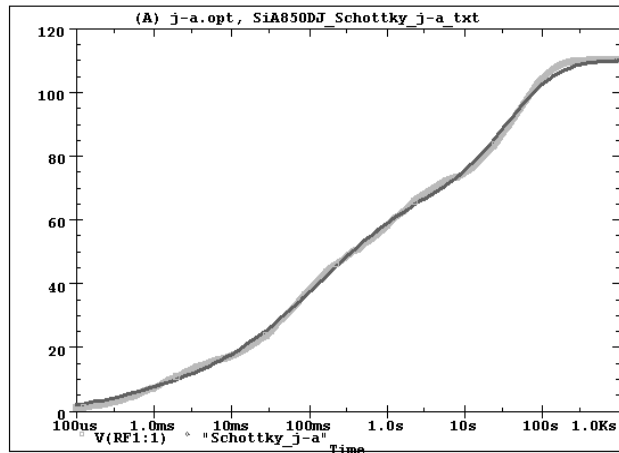
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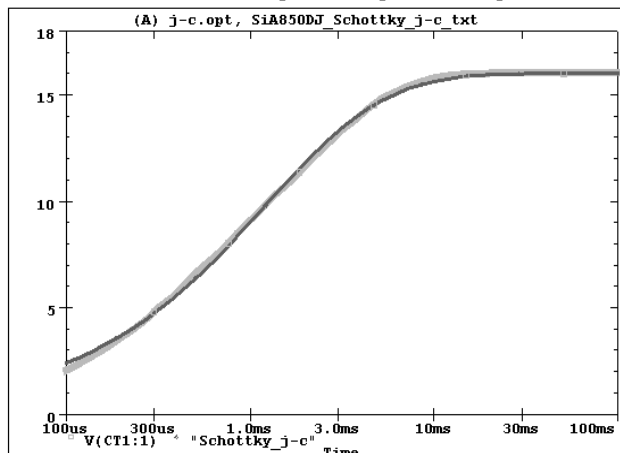
SiA850DJ Tank j-a Schottky Temperature:27.0



SiA850DJ Filter j-a Schottky Temperature:27.0



SiA850DJ Tank j-c Schottky Temperature:27.0



SiA850DJ Filter j-c Schottky Temperature:27.0

