

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.

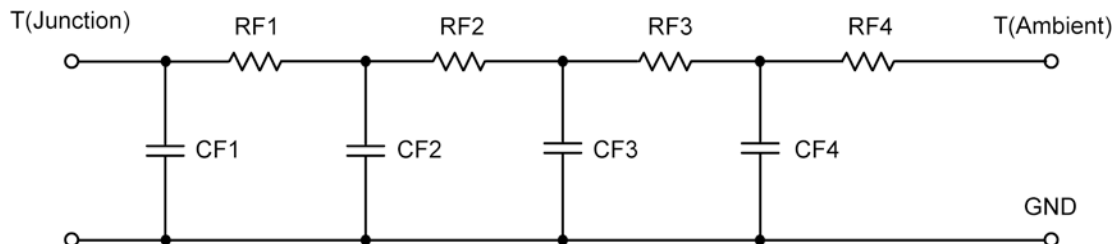
These RC values can be used in the P-SPICE simulation to evaluate the thermal behavior of the MOSFET junction temperature under a defined power profile. These techniques are described in Application Note AN609, "Thermal Simulation of Power MOSFETs on the P-Spice Platform."

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION				
Thermal Resistance (°C/W)				
Junction to	Ambient CH-1	Ambient CH-2	Foot CH-1	Foot CH-2
RT1	20.7533	20.7533	2.5410	2.5410
RT2	36.4525	36.4525	17.2124	17.2124
RT3	4.1874	4.1874	1.1564	1.1564
RT4	48.6068	48.6068	22.0902	22.0902
Thermal Capacitance (Joules/°C)				
Junction to	Ambient CH-1	Ambient CH-2	Foot CH-1	Foot CH-2
CT1	5.0105 m	5.0105 m	706.7919 u	706.7919 u
CT2	29.3134 m	29.3134 m	3.8326 m	3.8326 m
CT3	286.5768 u	286.5768 u	623.4015 u	623.4015 u
CT4	1.0885	1.0885	31.1366 m	31.1366 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**

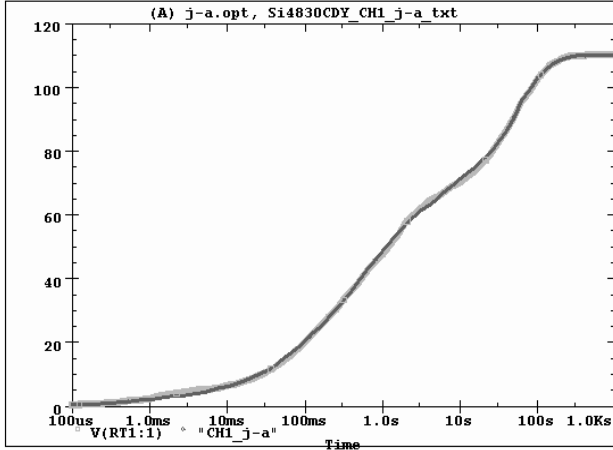
Thermal Resistance (°C/W)				
Junction to	Ambient CH-1	Ambient CH-2	Foot CH-1	Foot CH-2
RF1	4.7284	4.7284	3.5325	3.5325
RF2	31.6204	31.6204	14.5686	14.5686
RF3	28.0852	28.0852	13.4843	13.4843
RF4	45.5660	45.5660	11.4146	11.4146
Thermal Capacitance (Joules/°C)				
Junction to	Ambient CH-1	Ambient CH-2	Foot CH-1	Foot CH-2
CF1	286.4128 u	286.4128 u	285.5282 u	285.5282 u
CF2	4.3305 m	4.3305 m	2.3467 m	2.3467 m
CF3	40.7333 m	40.7333 m	9.5142 m	9.5142 m
CF4	1.1065	1.1065	52.7297 m	52.7297 m

Note

NA indicates not applicable

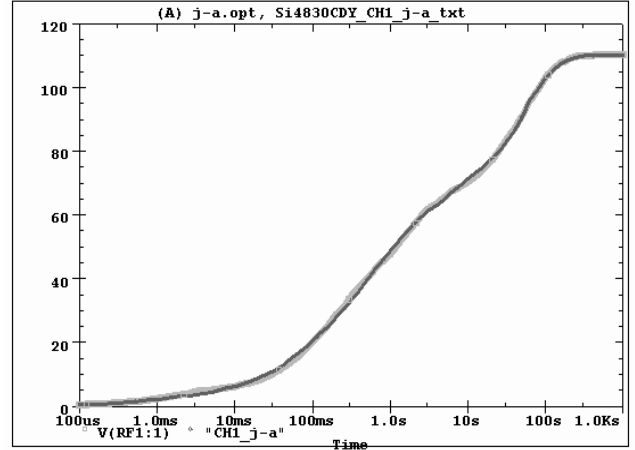


Si4830CDY Tank j-a CH1 Temperature:27.0



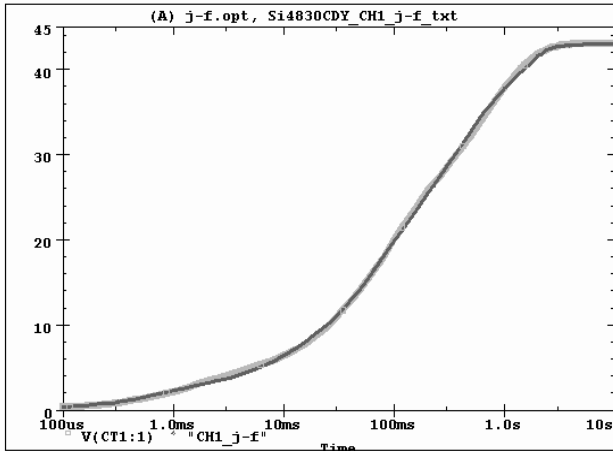
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Si4830CDY Filter j-a CH1 Temperature:27.0



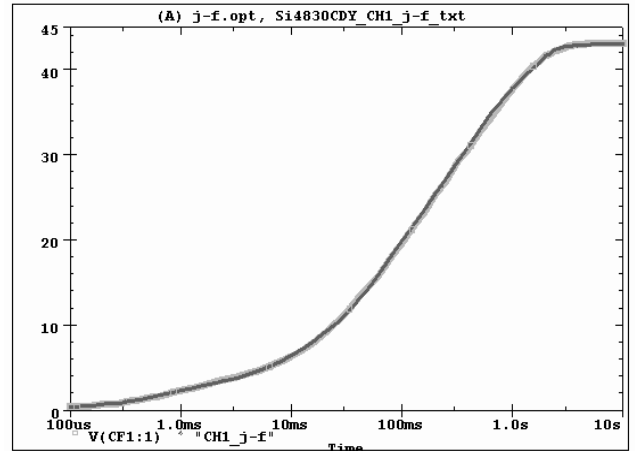
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Si4830CDY Tank j-f CH1 Temperature:27.0



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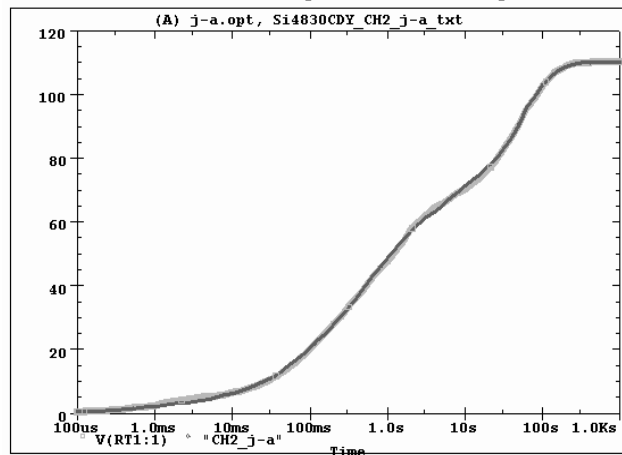
Si4830CDY Filter j-f CH1 Temperature:27.0



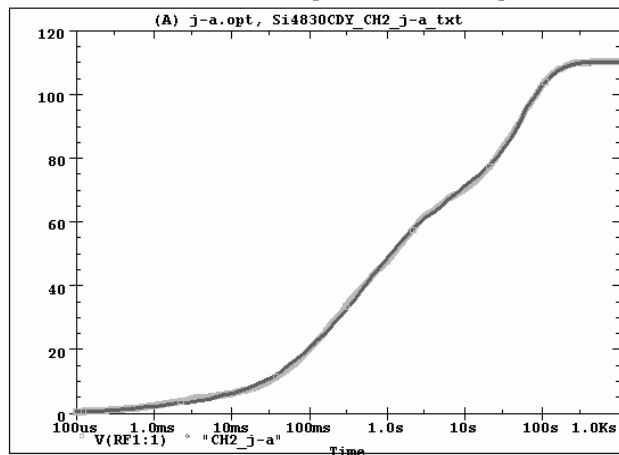
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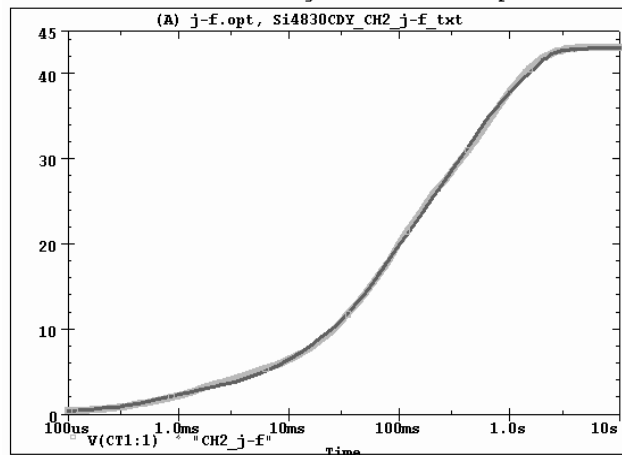
Si4830CDY Tank j-a CH2 Temperature:27.0



Si4830CDY Filter j-a CH2 Temperature:27.0



Si4830CDY Tank j-f CH2 Temperature:27.0



Si4830CDY Filter j-f CH2 Temperature:27.0

