

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-CH1	Case-CH1	Ambient-CH2	Case-CH2
RT1	6.2339	623.4000 m	3.5955	381.9481 m
RT2	14.9833	1.4143	13.5640	591.0242 m
RT3	20.0274	1.3841	18.7959	1.3842
RT4	38.7554	2.0782	44.0446	742.8000 m
Thermal Capacitance (Joules/°C)				
Junction to	Ambient-CH1	Case-CH1	Ambient-CH2	Case-CH2
CT1	1.6361 m	1.3716	1.6316 m	150.0863 m
CT2	33.3391 m	1.6053 m	46.8319 m	484.9802 u
CT3	723.0025 m	830.1273 u	712.5055 m	5.3486 m
CT4	3.0308	7.7569 m	2.3842	27.4219 m

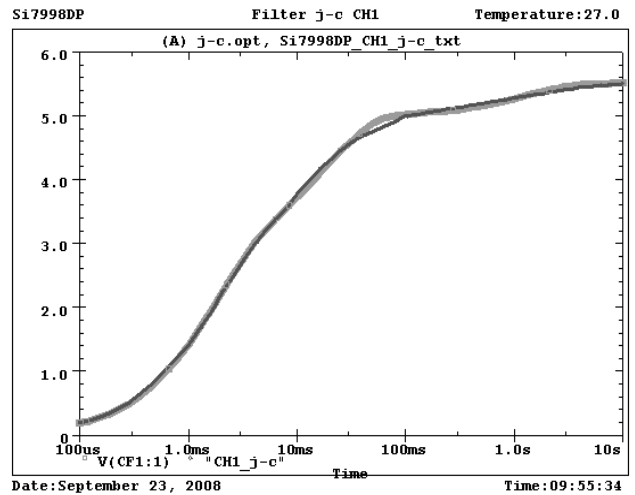
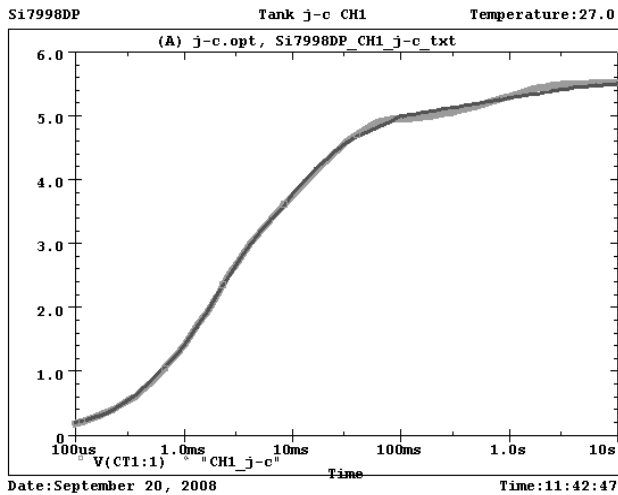
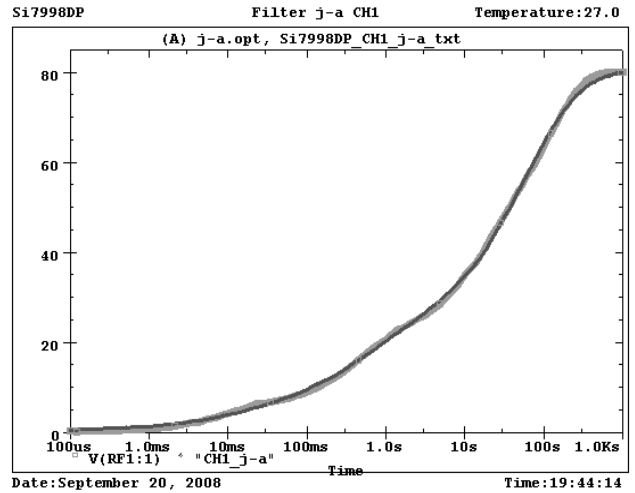
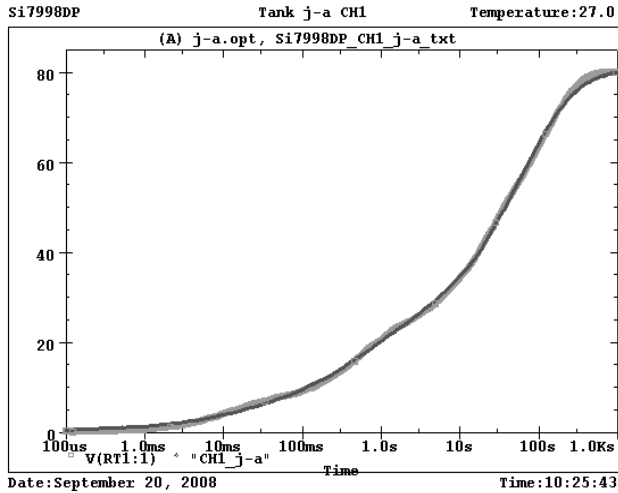
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION**R-C VALUES FOR FILTER CONFIGURATION**

Thermal Resistance ($^{\circ}\text{C}/\text{W}$)				
Junction to	Ambient-CH1	Case-CH1	Ambient-CH2	Case-CH2
RF1	6.2528	3.1111	3.8581	667.8400 m
RF2	16.0082	427.6000 m	15.7398	974.2200 m
RF3	27.1427	1.4667	30.6393	1.2586
RF4	30.5963	494.6000 m	29.7628	199.3400 m
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)				
Junction to	Ambient-CH1	Case-CH1	Ambient-CH2	Case-CH2
CF1	1.4235 m	528.7806 u	1.5101 m	422.6229 u
CF2	26.8137 m	6.6443 m	42.0099 m	3.4167 m
CF3	520.4286 m	3.4190 m	558.5053 m	3.8185 m
CF4	3.1353	2.5279	3.0284	262.1001 m

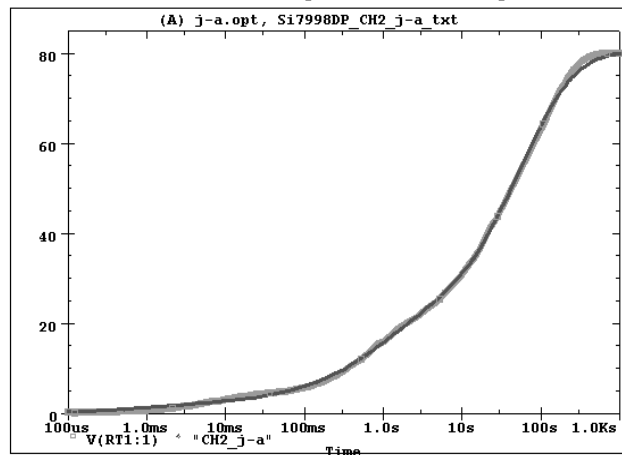
Note

NA indicates not applicable

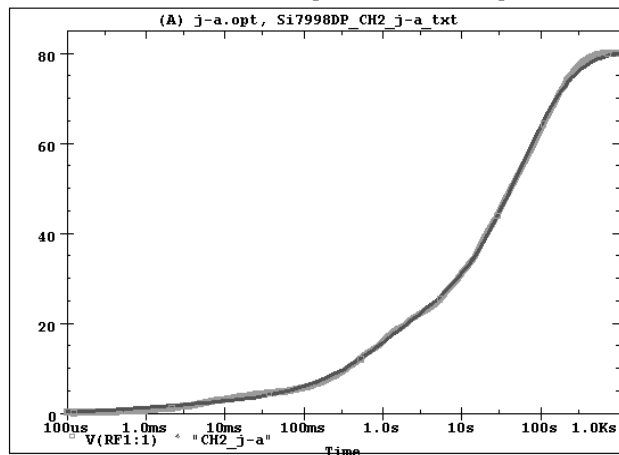




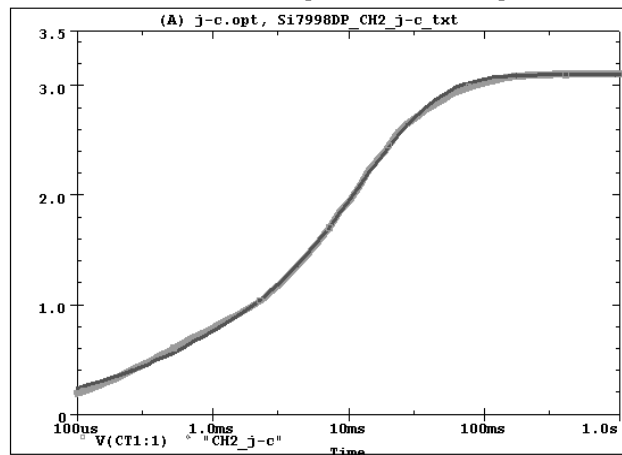
Si7998DP Tank j-a CH2 Temperature:27.0



Si7998DP Filter j-a CH2 Temperature:27.0



Si7998DP Tank j-c CH2 Temperature:27.0



Si7998DP Filter j-c CH2 Temperature:27.0

