

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	Case	Foot
RT1	16.9603	N/A	3.7256
RT2	3.6638	N/A	9.3265
RT3	15.4122	N/A	7.2218
RT4	48.9637	N/A	1.7261
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	116.7346 m	N/A	647.8064 m
CT2	2.3211 m	N/A	91.3393 m
CT3	38.9570 m	N/A	11.7365 m
CT4	1.1914	N/A	1.3544 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**

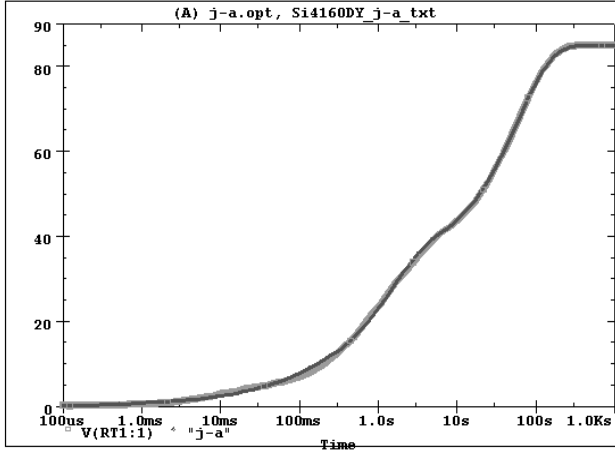
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)			
Junction to	Ambient	Case	Foot
RF1	5.0511	N/A	1.7334
RF2	19.7429	N/A	6.4878
RF3	16.4562	N/A	6.2912
RF4	43.7498	N/A	7.4876
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)			
Junction to	Ambient	Case	Foot
CF1	3.0247 m	N/A	1.2456 m
CF2	23.0892 m	N/A	7.0484 m
CF3	97.4416 m	N/A	24.7184 m
CF4	1.2396	N/A	145.9827 m

Note

NA indicates not applicable

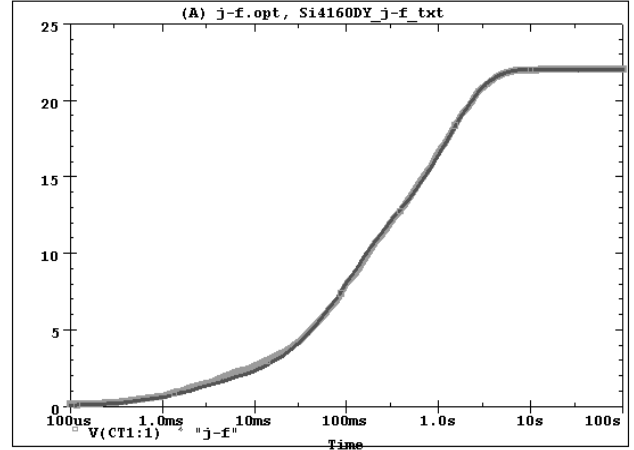


Si4160DY Tank j-a Temperature:27.0



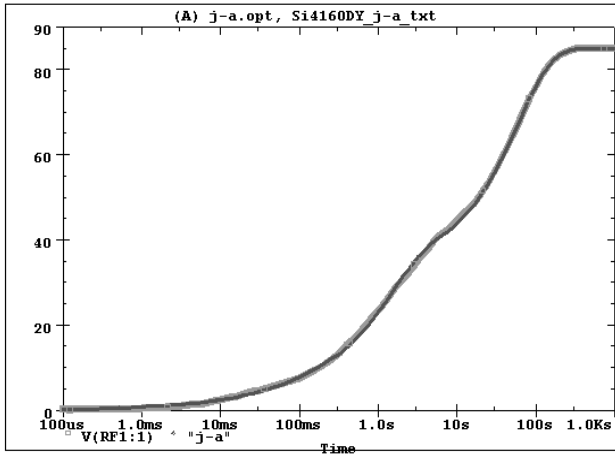
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Si4160DY Tank j-f Temperature:27.0



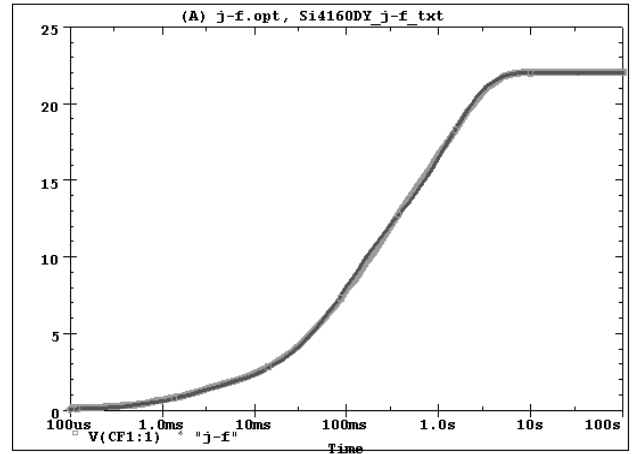
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Si4160DY Filter j-a Temperature:27.0



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Si4160DY Filter j-f Temperature:27.0



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