

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	13.3044	N/A	8.9352
RT2	3.7268	N/A	1.5267
RT3	22.1704	N/A	2.3889
RT4	41.7984	N/A	8.1492
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	25.7575 m	N/A	8.9395 m
CT2	3.0250 m	N/A	612.8259 u
CT3	120.4017 m	N/A	1.3469
CT4	2.0911	N/A	120.2485 m

Note

N/A indicates not applicable

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

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

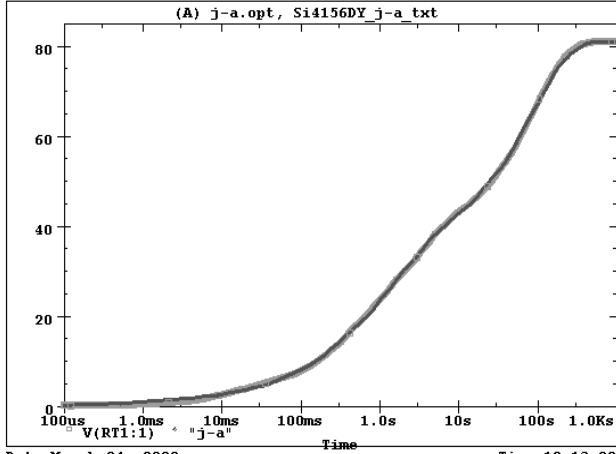
THERMAL RESISTANCE (°C/W)			
Junction to	Ambient	Case	Foot
RF1	4.2069	N/A	1.5331
RF2	19.3118	N/A	9.7469
RF3	19.3486	N/A	7.2795
RF4	38.1327	N/A	2.4405
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	2.1239 m	N/A	524.9641 u
CF2	18.5666 m	N/A	7.2006 m
CF3	136.4733 m	N/A	92.2570 m
CF4	2.1734	N/A	720.1278 m

Note

N/A indicates not applicable

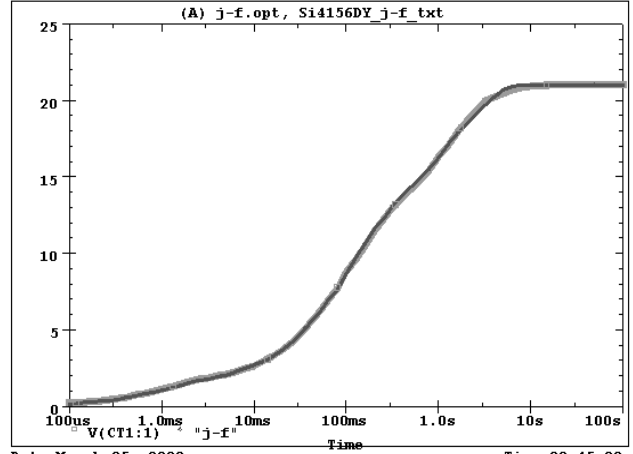


Si4156DY Tank j-a Temperature:27.0



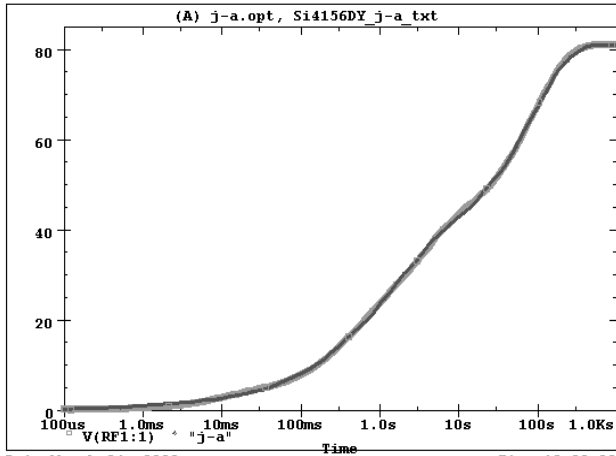
Date:March 24, 2009 Time:10:13:09

Si4156DY Tank j-f Temperature:27.0



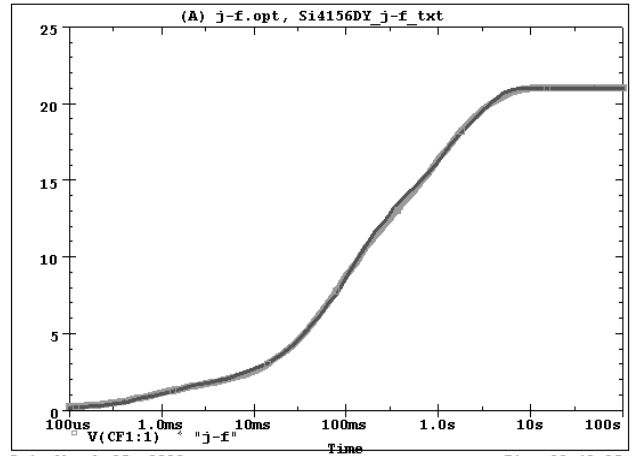
Date:March 25, 2009 Time:09:45:00

Si4156DY Filter j-a Temperature:27.0



Date:March 24, 2009 Time:10:28:33

Si4156DY Filter j-f Temperature:27.0



Date:March 25, 2009 Time:09:49:35