

## 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

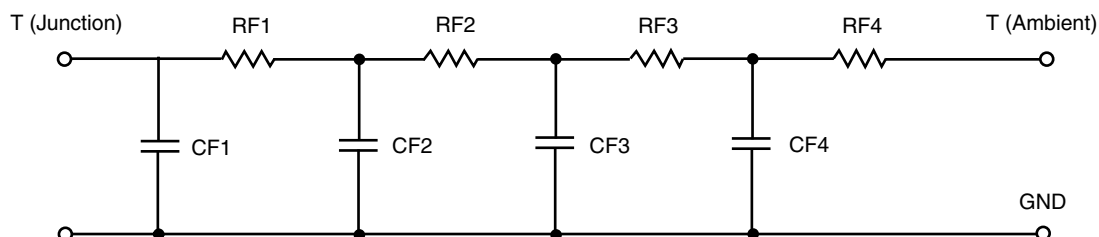


R-C VALUES FOR TANK CONFIGURATION				
THERMAL RESISTANCE (°C/W)				
Junction to	Ambient NCh	Ambient PCh	Case NCh	Case PCh
RT1	12.4956	12.4956	764.1000 m	764.1000 m
RT2	27.7856	27.7856	5.6063	5.6063
RT3	26.5938	26.5938	5.7425	5.7425
RT4	43.1250	43.1250	3.8871	3.8871
THERMAL CAPACITANCE (Joules/°C)				
Junction to	Ambient NCh	Ambient PCh	Case NCh	Case PCh
CT1	90.6753 u	90.1579 u	5.0483 m	5.0483 m
CT2	1.9893 m	1.9779 m	452.2021 u	452.2021 u
CT3	34.1166 m	35.0295 m	54.4164 u	54.4164 u
CT4	1.1119	1.1315	486.1773 u	486.1773 u

#### 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**

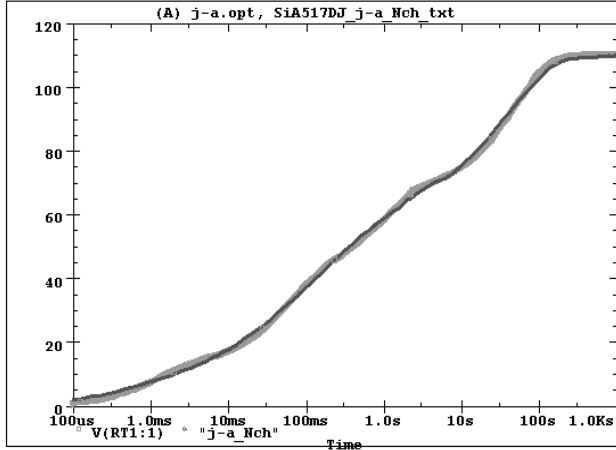
THERMAL RESISTANCE (°C/W)				
Junction to	Ambient NCh	Ambient PCh	Case NCh	Case PCh
RF1	14.2316	14.2316	8.6635	8.6635
RF2	31.2018	31.2018	4.0091	4.0091
RF3	23.4786	23.4786	1.6771	1.6771
RF4	41.0898	41.0898	1.6503	1.6503
THERMAL CAPACITANCE (Joules/°C)				
Junction to	Ambient NCh	Ambient PCh	Case NCh	Case PCh
CF1	92.1040 u	92.1040 u	43.9117 u	43.9117 u
CF2	2.0224 m	2.0224 m	226.4934 u	226.4934 u
CF3	41.6061 m	41.6061 m	229.4698 u	229.4698 u
CF4	1.1219	1.1219	103.4306 u	103.4306 u

**Note**

N/A indicates not applicable

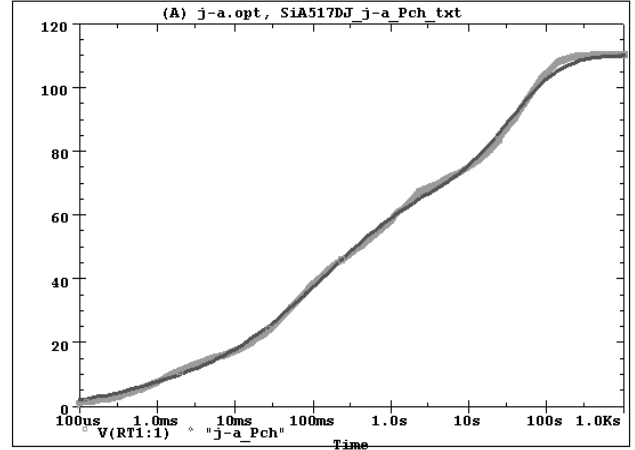


SiA517DJ Tank j-a N Channel Temperature:27.0



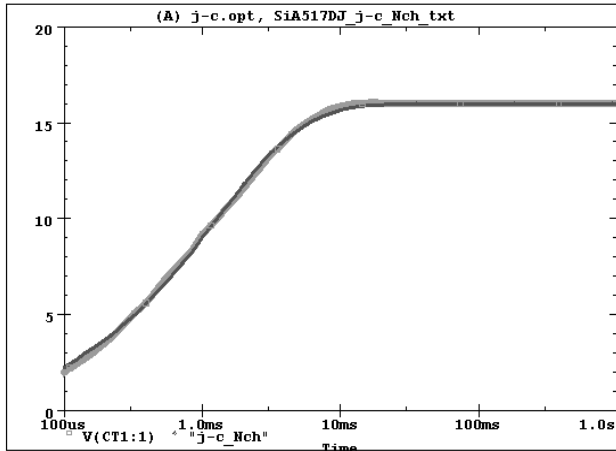
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SiA517DJ Tank j-a P Channel Temperature:27.0



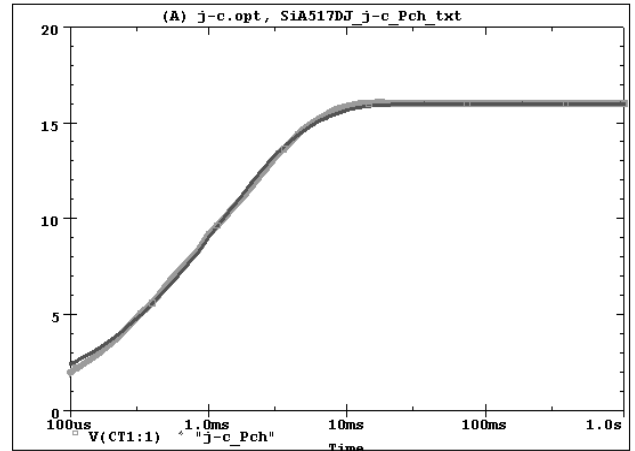
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SiA517DJ Tank j-c N Channel Temperature:27.0



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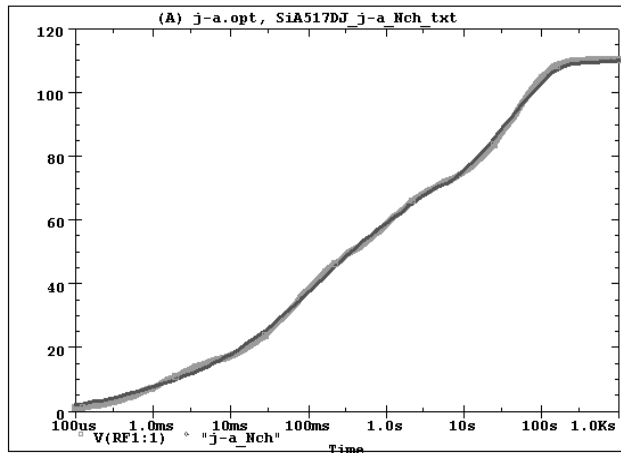
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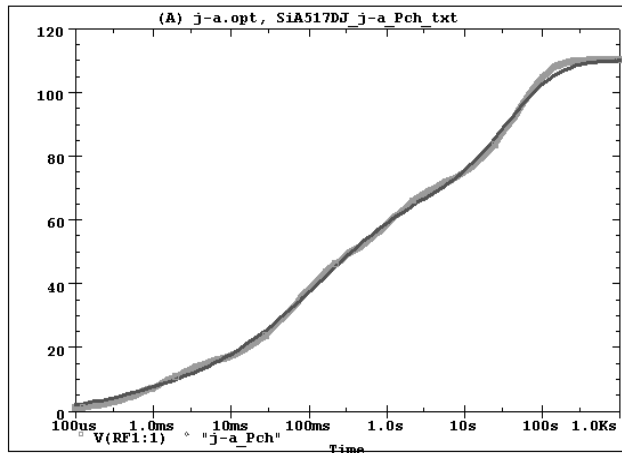


SiA517DJ Filter j-a N Channel Temperature:27.0



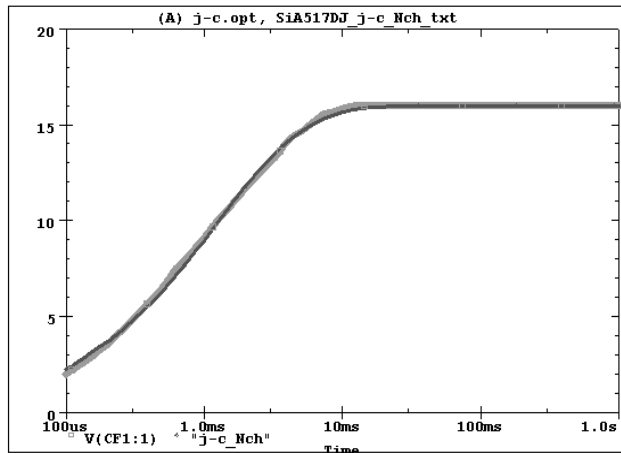
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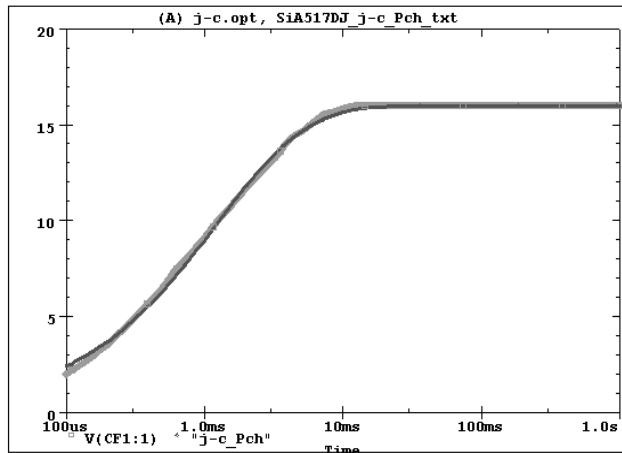
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SiA517DJ Filter j-c N Channel Temperature:27.0



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SiA517DJ Filter j-c P Channel Temperature:27.0



Date:April 02, 2009 Time:19:25:09