

## 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

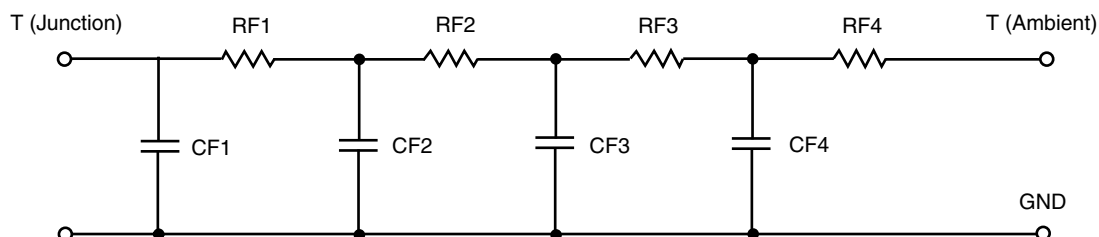


<b>R-C VALUES FOR TANK CONFIGURATION</b>			
<b>THERMAL RESISTANCE (°C/W)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
RT1	17.4576	69.2866 m	N/A
RT2	25.6216	445.6088 m	N/A
RT3	8.8790	109.1196 m	N/A
RT4	2.0418	575.9850 m	N/A
<b>THERMAL CAPACITANCE (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	1.5215	11.7400 m	N/A
CT2	4.9648	210.1211 m	N/A
CT3	113.2358 m	959.6505 u	N/A
CT4	14.5687 m	24.7249 m	N/A

#### 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**

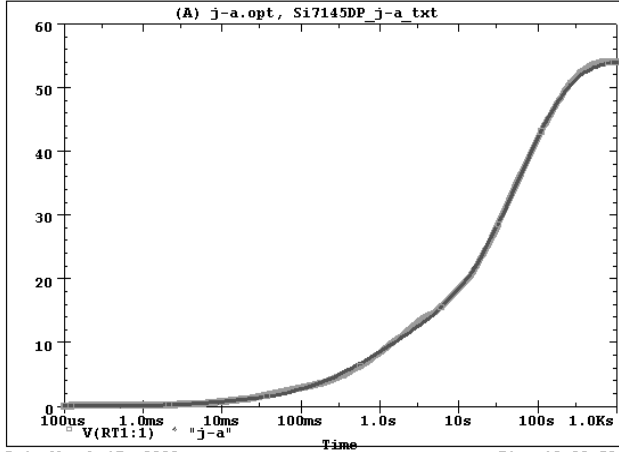
THERMAL RESISTANCE (°C/W)			
Junction to	Ambient	Case	Foot
RF1	4.0018	156.6073 m	N/A
RF2	7.8355	223.2650 m	N/A
RF3	25.1329	417.4349 m	N/A
RF4	17.0298	402.6928 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	23.9890 m	890.2000 u	N/A
CF2	97.5121 m	16.6643 m	N/A
CF3	922.4918 m	2.1855 m	N/A
CF4	6.2118	157.0029 m	N/A

**Note**

N/A indicates not applicable



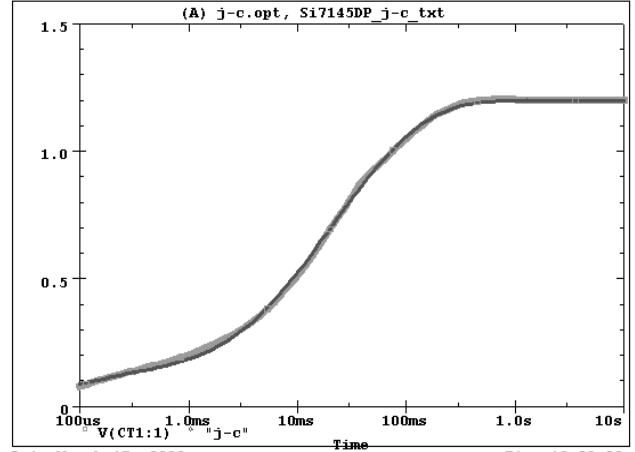
Si7145DP Tank j-a Temperature:27.0



Date:March 17, 2009

Time:10:33:53

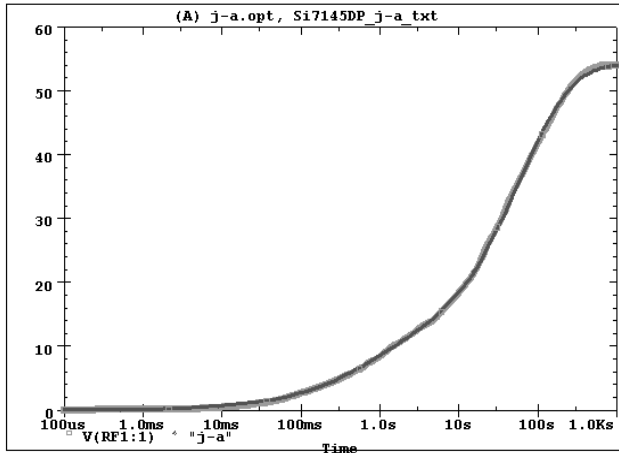
Si7145DP Tank j-c Temperature:27.0



Date:March 17, 2009

Time:10:39:39

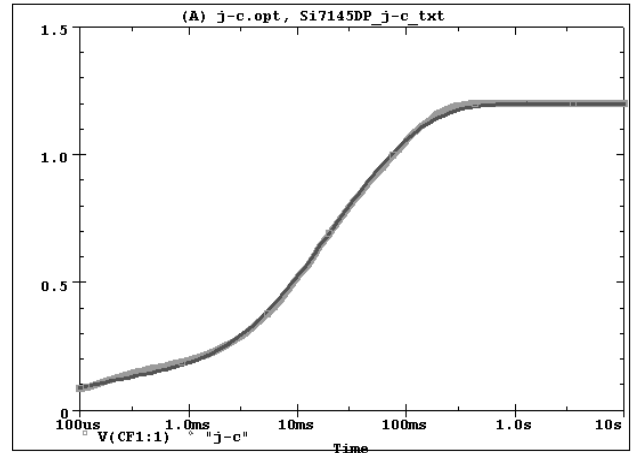
Si7145DP Filter j-a Temperature:27.0



Date:March 17, 2009

Time:10:46:05

Si7145DP Filter j-c Temperature:27.0



Date:March 17, 2009

Time:10:49:33