R-C Thermal Model Parameters

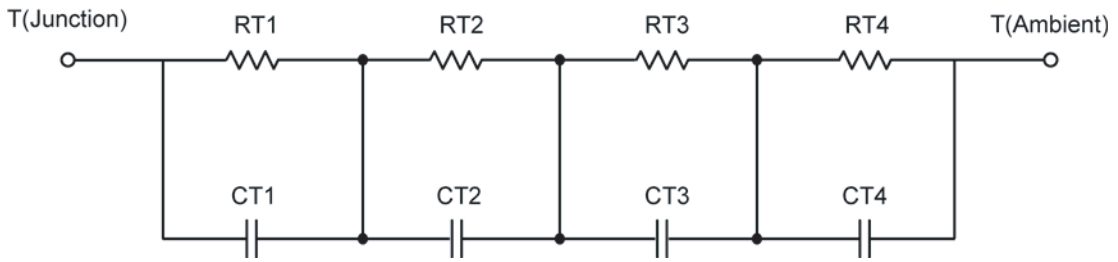
DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "A Simple Method of Generating Thermal Models for a Power MOSFET"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank configuration are included. The corresponding values for the Cauer/Filter configuration are available upon request.

Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

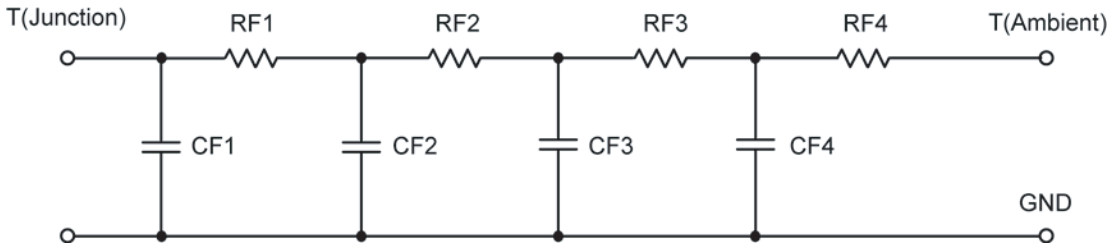
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	816.9183 m	324.4979 u	N/A
RT2	6.3753	286.9499 m	N/A
RT3	8.4873	251.3020 m	N/A
RT4	48.9947	762.3926 m	N/a
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3984 m	625.3748 u	N/A
CT2	49.9901 m	3.0330 m	N/A
CT3	294.4438 m	39.2410 m	N/A
CT4	1.3751	11.3185 m	N/A

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



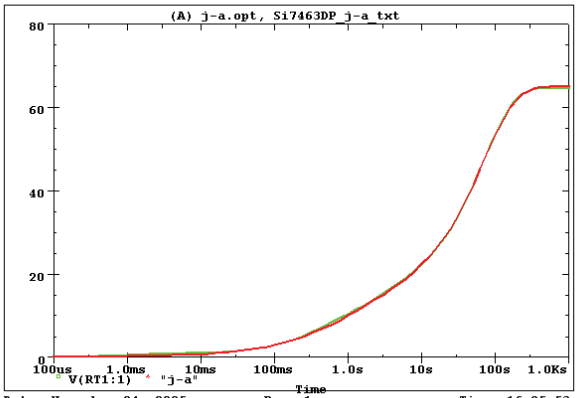
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.6597	250.0066 m	N/A
RF2	6.7288	255.7609 m	N/A
RF3	6.9255	578.7731 m	N/A
RF4	43.5775	214.5172 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	27.3576 m	1.4941 m	N/A
CF2	220.2736 m	3.1793 m	N/A
CF3	30.2816 m	4.4688 m	N/A
CF4	1.3100	103.3651 u	N/A

Note: NA indicates not applicable

Reference:

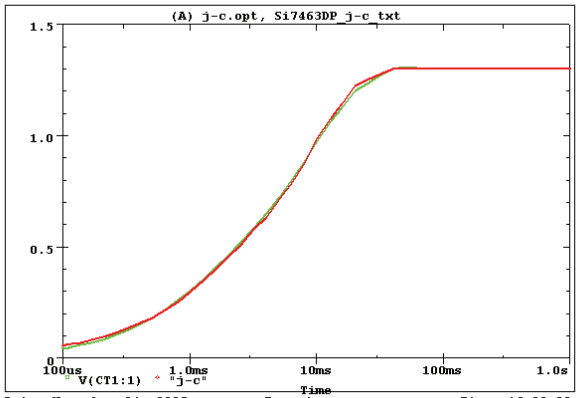
[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002

Si7463DP Tank j-a Temperature: 27.0



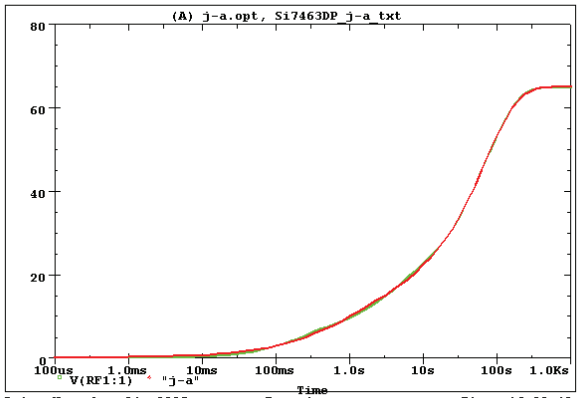
Date: November 04, 2005 Page 1 Time: 16:25:53

Si7463DP Tank j-c Temperature: 27.0



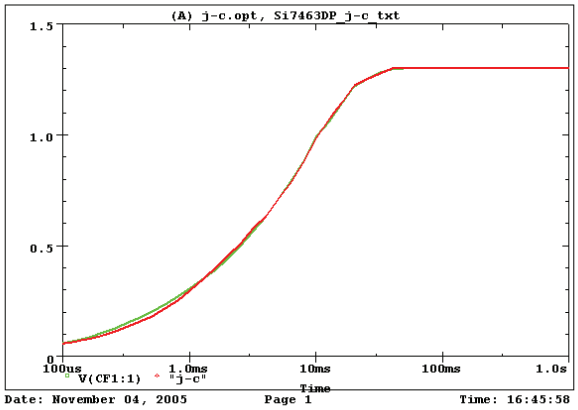
Date: November 04, 2005 Page 1 Time: 16:30:23

Si7463DP Filter j-a Temperature: 27.0



Date: November 04, 2005 Page 1 Time: 16:38:43

Si7463DP Filter j-c Temperature: 27.0



Date: November 04, 2005 Page 1 Time: 16:45:58