

## 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-Full Copper</b>	<b>Case</b>	<b>Ambient-Minimum Copper</b>
RT1	21.1702	N/A	43.2531
RT2	38.5859	N/A	67.7423
RT3	10.0032	N/A	36.5484
RT4	30.2407	N/A	42.4562
<b>THERMAL CAPACITANCE (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient-Full Copper</b>	<b>Case</b>	<b>Ambient-Minimum Copper</b>
CT1	247.0957 u	N/A	786.6692 u
CT2	1.0228 m	N/A	3.6050 m
CT3	67.3635 m	N/A	53.2709 m
CT4	1.0425	N/A	637.2618 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**

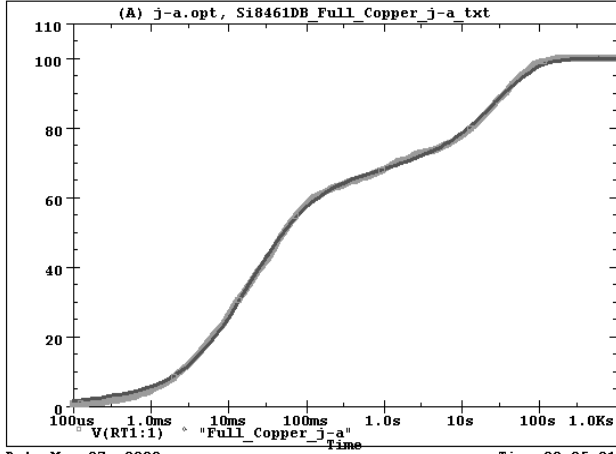
THERMAL RESISTANCE (°C/W)			
Junction to	Ambient-Full Copper	Case	Ambient-Minimum Copper
RF1	6.9226	N/A	18.9036
RF2	43.8887	N/A	77.6354
RF3	18.2254	N/A	51.5693
RF4	30.9633	N/A	41.8918
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient-Full Copper	Case	Ambient-Minimum Copper
CF1	75.2476 u	N/A	389.7928 u
CF2	299.0840 u	N/A	839.8825 u
CF3	9.5148 m	N/A	18.4593 m
CF4	938.1982 m	N/A	505.4127 m

**Note**

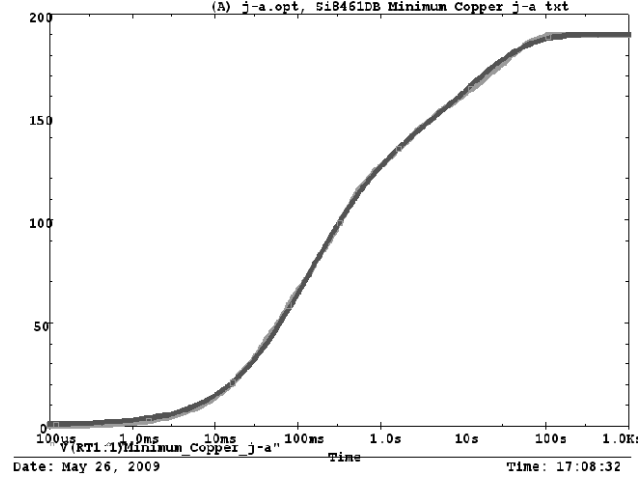
N/A indicates not applicable



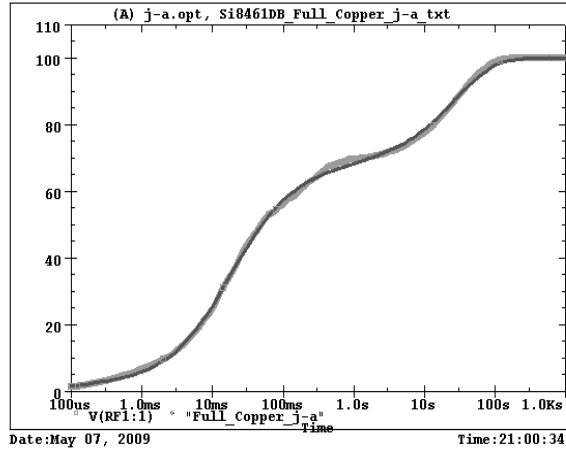
Si8461DB Tank j-a Full -Copper Temperature:27.0



Si8461DB Tank j-a Minimum Copper Temperature: 27.0



Si8461DB Filter j-a Full -Copper Temperature:27.0



Si8461DB Filter j-a Minimum Copper Temperature: 27.0

