

## 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

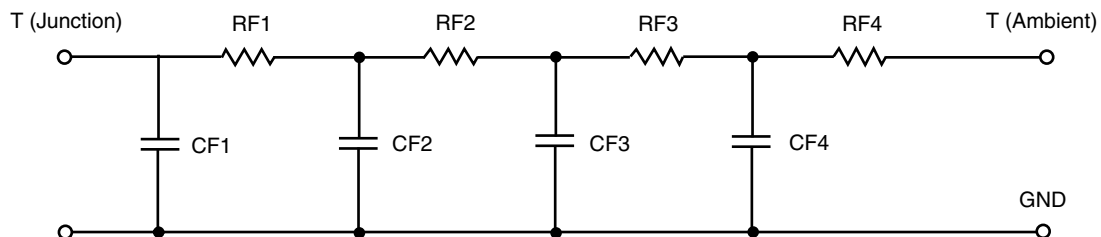


<b>R-C VALUES FOR TANK CONFIGURATION</b>			
<b>THERMAL RESISTANCE (°C/W)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
RT1	4.2525	362.4000 u	N/A
RT2	7.7612	504.3467 m	N/A
RT3	12.2156	972.1139 m	N/A
RT4	56.7707	923.1770 m	N/A
<b>THERMAL CAPACITANCE (Joules/°C)</b>			
<b>Junction to</b>	<b>Ambient</b>	<b>Case</b>	<b>Foot</b>
CT1	6.7215 m	1.9260 m	N/A
CT2	30.3603 m	787.5516 u	N/A
CT3	114.6204 m	18.2079 m	N/A
CT4	1.2151	9.3126 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**

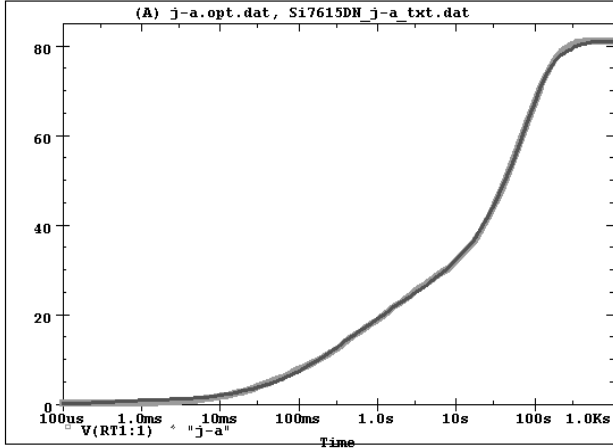
THERMAL RESISTANCE (°C/W)			
Junction to	Ambient	Case	Foot
RF1	7.6647	2.8700 m	N/A
RF2	9.5907	672.0000 m	N/A
RF3	10.8274	1.0331	N/A
RF4	52.8172	692.0300 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case	Foot
CF1	5.9406 m	125.4667 u	N/A
CF2	24.1531 m	695.7232 u	N/A
CF3	154.1887 m	6.0783 m	N/A
CF4	1.1220	527.9622 u	N/A

**Note**

N/A indicates not applicable



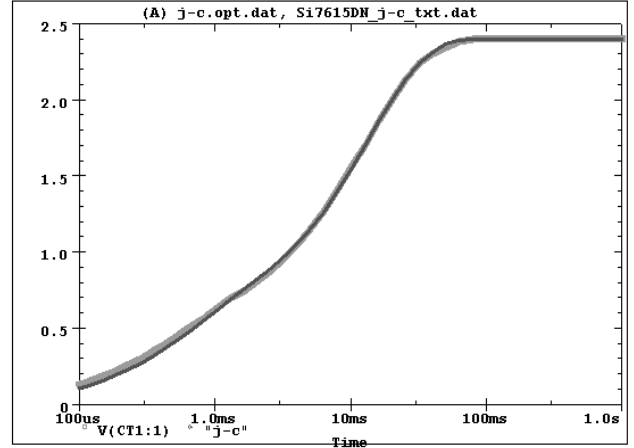
Si7615DN Tank j-a Temperature: 27.0



Date: September 01, 2009

Time: 11:29:49

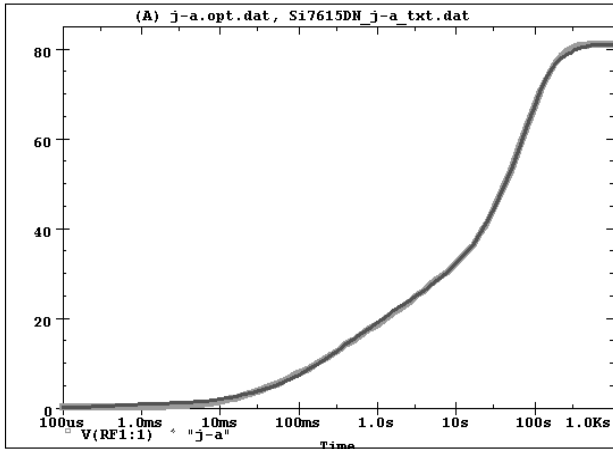
Si7615DN Tank j-c Temperature: 27.0



Date: September 01, 2009

Time: 11:33:11

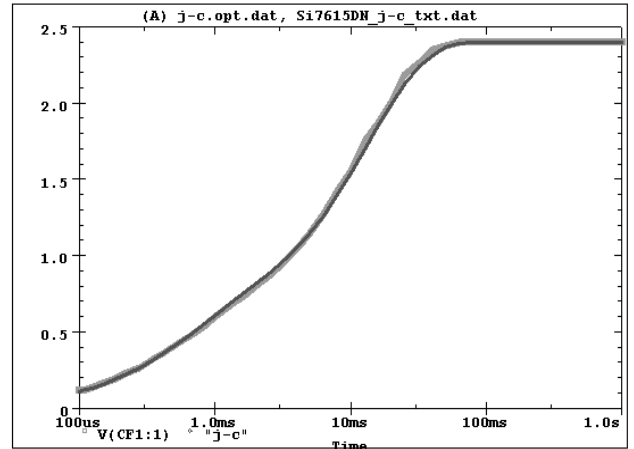
Si7615DN Filter j-a Temperature: 27.0



Date: September 01, 2009

Time: 11:36:57

Si7615DN Filter j-c Temperature: 27.0



Date: September 01, 2009

Time: 11:40:20