# 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 and Cauer/Filter configurations are included.

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
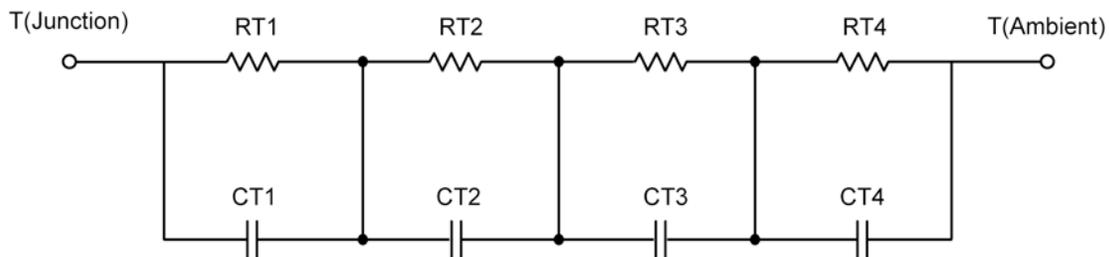
R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	Ambient	Case	Foot
RT1	1.6776	N/A	N/A
RT2	9.0721	N/A	N/A
RT3	6.9636	N/A	N/A
RT4	32.2867	N/A	N/A
Thermal Capacitance (Joules/°C)			
Junction to	Ambient	Case	Foot
CT1	2.4587 m	N/A	N/A
CT2	657.5557 m	N/A	N/A
CT3	45.2102 m	N/A	N/A
CT4	1.3796	N/A	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
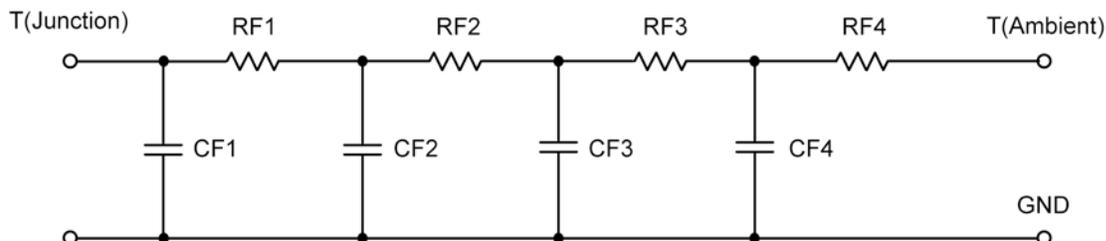
<table>
<tr><th colspan="4">R-C VALUES FOR FILTER CONFIGURATION</th></tr>
<tr><th colspan="4">Thermal Resistance (°C/W)</th></tr>
<tr><th>Junction to</th><th>Ambient</th><th>Case</th><th>Foot</th></tr>
<tr><td>RF1</td><td>1.7590</td><td>N/A</td><td>N/A</td></tr>
<tr><td>RF2</td><td>7.7083</td><td>N/A</td><td>N/A</td></tr>
<tr><td>RF3</td><td>14.1246</td><td>N/A</td><td>N/A</td></tr>
<tr><td>RF4</td><td>26.4081</td><td>N/A</td><td>N/A</td></tr>
<tr><th colspan="4">Thermal Capacitance (Joules/°C)</th></tr>
<tr><th>Junction to</th><th>Ambient</th><th>Case</th><th>Foot</th></tr>
<tr><td>CF1</td><td>1.9124 m</td><td>N/A</td><td>N/A</td></tr>
<tr><td>CF2</td><td>36.6273 m</td><td>N/A</td><td>N/A</td></tr>
<tr><td>CF3</td><td>352.4759 m</td><td>N/A</td><td>N/A</td></tr>
<tr><td>CF4</td><td>1.1058</td><td>N/A</td><td>N/A</td></tr>
</table>

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