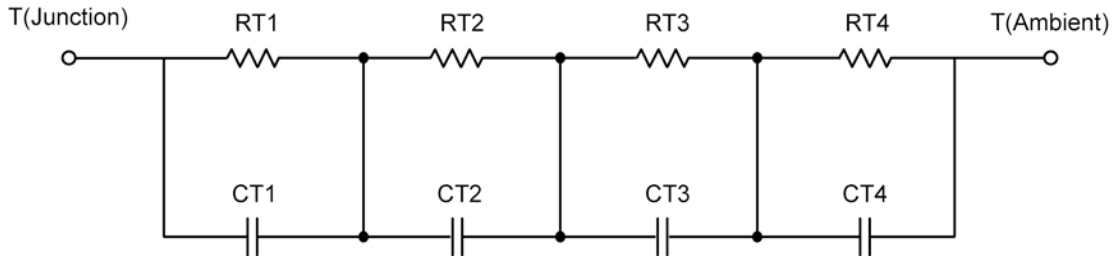
# R-C Thermal Model Parameters

## 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."

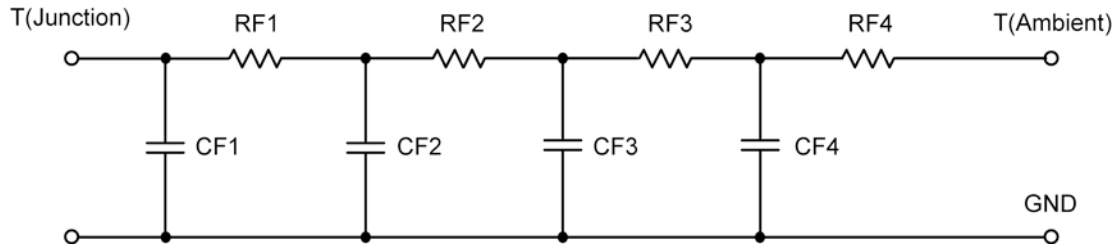
## R-C THERMAL MODEL FOR TANK CONFIGURATION




| R-C VALUES FOR TANK CONFIGURATION | | | |
|---|---|---|---|
| Thermal Resistance (°C/W) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RT1 | N/A | 38.1707 m | N/A |
| RT2 | N/A | 294.8138 m | N/A |
| RT3 | N/A | 89.2967 m | N/A |
| RT4 | N/A | 177.7188 m | N/A |
| Thermal Capacitance (Joules/°C) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CT1 | N/A | 8.1491 m | N/A |
| CT2 | N/A | 187.0855 m | N/A |
| CT3 | N/A | 35.1278 m | N/A |
| CT4 | N/A | 76.1299 m | N/A |

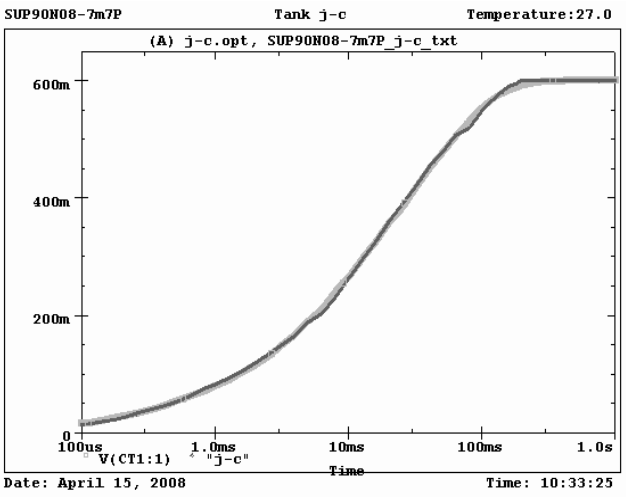
*This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.*

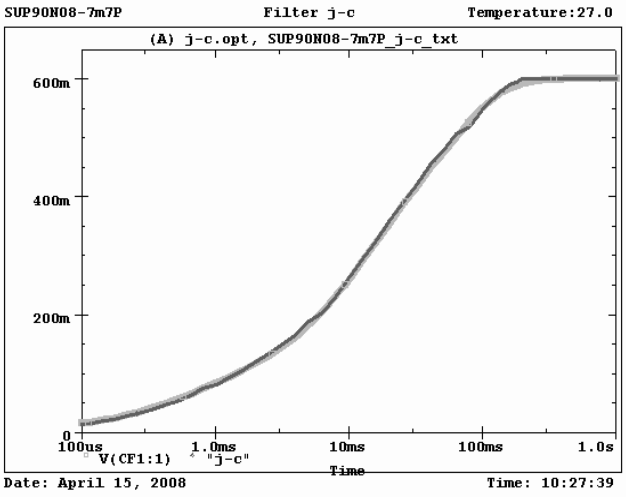
## R-C THERMAL MODEL FOR FILTER CONFIGURATION




| R-C VALUES FOR FILTER CONFIGURATION | | | |
|---|---|---|---|
| **Thermal Resistance (°C/W)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RF1 | N/A | 96.2019 m | N/A |
| RF2 | N/A | 173.0276 m | N/A |
| RF3 | N/A | 127.8896 m | N/A |
| RF4 | N/A | 202.8809 m | N/A |
| **Thermal Capacitance (Joules/°C)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CF1 | N/A | 6.2728 m | N/A |
| CF2 | N/A | 31.3666 m | N/A |
| CF3 | N/A | 914.6713 u | N/A |
| CF4 | N/A | 213.1208 m | N/A |

**Note**
NA indicates not applicable


SUP90N08-7m7P
Tank j-c
Temperature:27.0
(A) j-c.opt, SUP90N08-7m7P_j-c_txt
600m
400m
200m
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: April 15, 2008
Time: 10:33:25


SUP90N08-7m7P
Filter j-c
Temperature:27.0
(A) j-c.opt, SUP90N08-7m7P_j-c_txt
600m
400m
200m
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: April 15, 2008
Time: 10:27:39