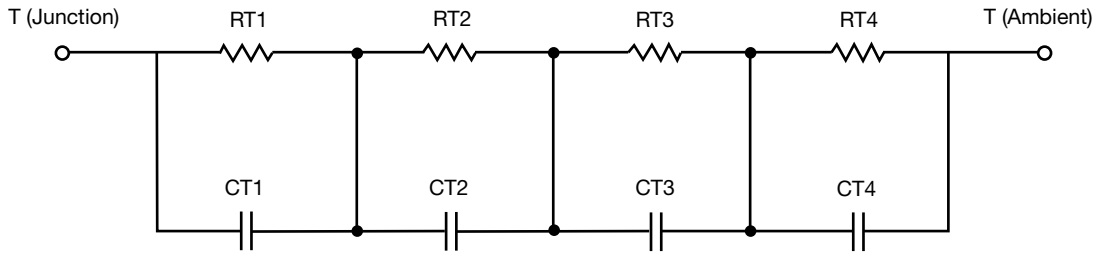
# R-C Thermal Model Parameters

## 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 PSpice, 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 PSpice 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 PSpice Platform”.

## R-C THERMAL MODEL FOR TANK CONFIGURATION




| R-C VALUES FOR TANK CONFIGURATION | | | |
|---|---|---|---|
| THERMAL RESISTANCE (°C/W) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RT1 | 5.5199 | 1.2365 | n/a |
| RT2 | 11.5769 | 999.8000m | n/a |
| RT3 | 17.6842 | 4.1206 | n/a |
| RT4 | 45.2190 | 143.1000m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CT1 | 440.0251u | 198.8699u | n/a |
| CT2 | 203.3389m | 7.2601m | n/a |
| CT3 | 6.6246m | 538.7673u | n/a |
| CT4 | 1.7688 | 52.2509m | 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.*



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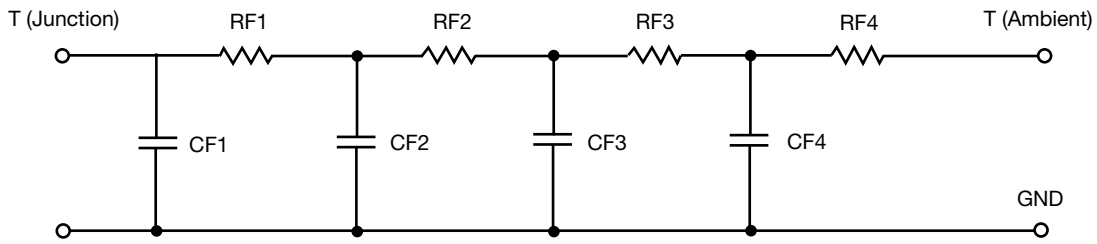
## R-C THERMAL MODEL FOR FILTER CONFIGURATION




| R-C VALUES FOR FILTER CONFIGURATION | | | |
|---|---|---|---|
| **THERMAL RESISTANCE (°C/W)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RF1 | 4.9502 | 2.6614 | n/a |
| RF2 | 18.9752 | 3.5742 | n/a |
| RF3 | 12.7811 | 99.9977m | n/a |
| RF4 | 43.2935 | 164.4023m | n/a |
| **THERMAL CAPACITANCE (Joules/°C)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CF1 | 307.9476u | 159.3819u | n/a |
| CF2 | 5.0635m | 521.4187u | n/a |
| CF3 | 158.6997m | 44.3088m | n/a |
| CF4 | 1.6375 | 207.5850u | n/a |

**Note**

- n/a indicates not applicable



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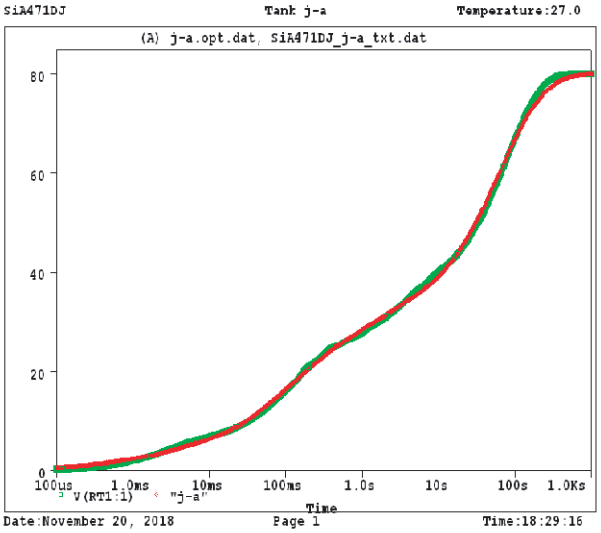


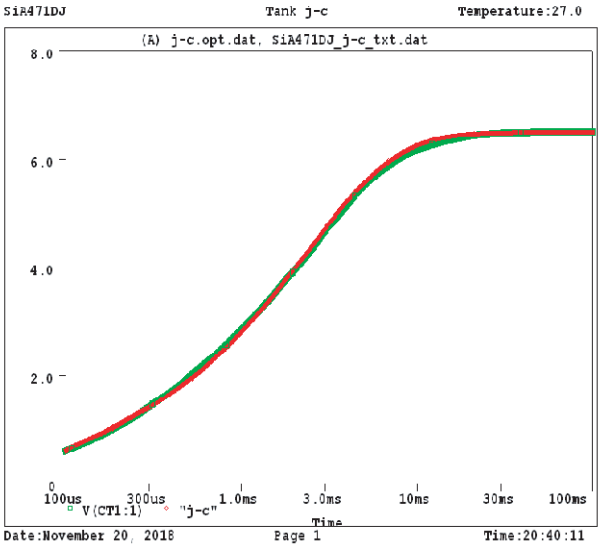


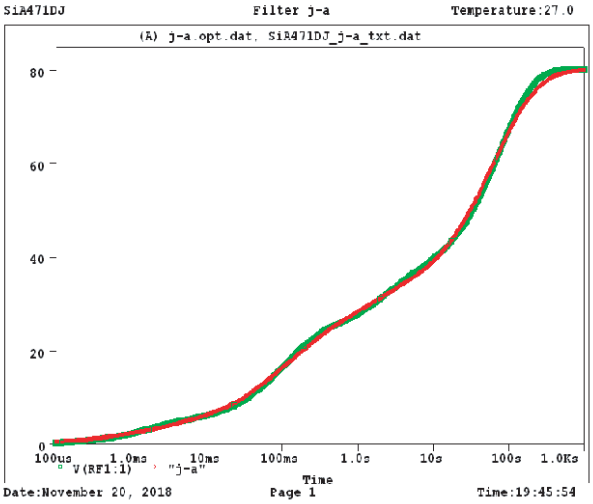


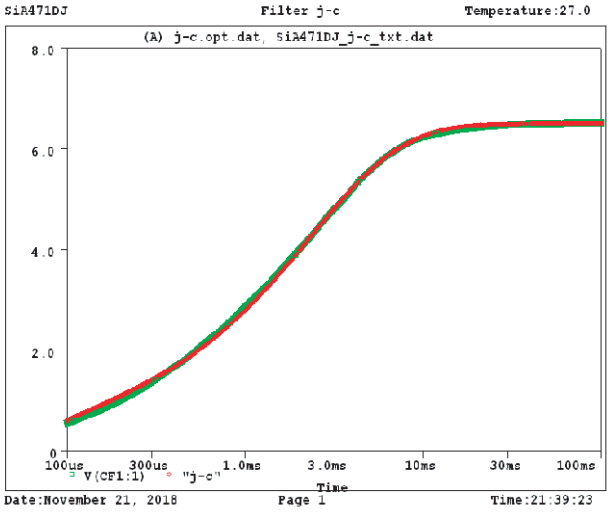




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