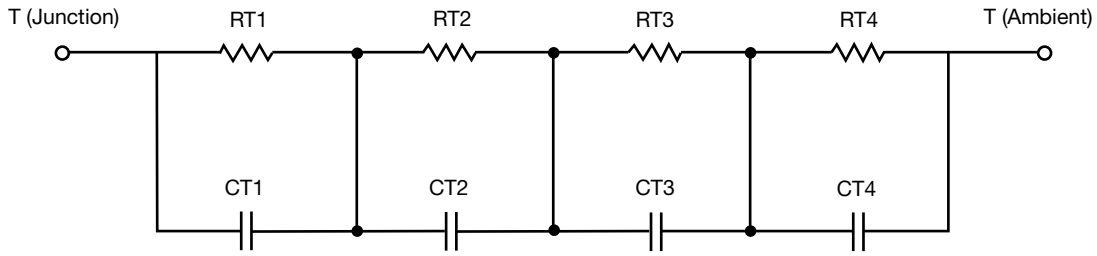
# R-C Thermal Model Parameters

## 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



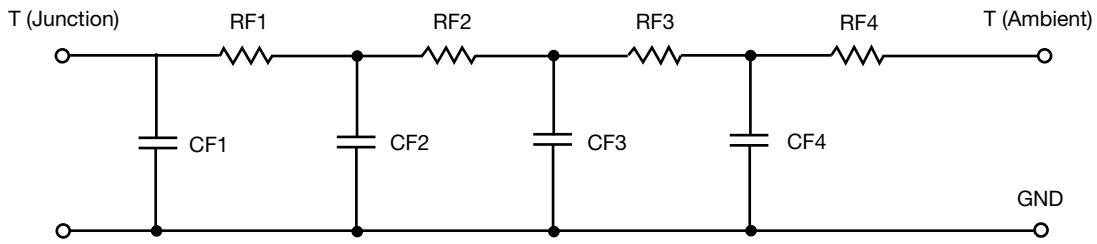

| R-C VALUES FOR TANK CONFIGURATION | | | |
|---|---|---|---|
| THERMAL RESISTANCE (°C/W) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RT1 | 3.9825 | 27.7226m | n/a |
| RT2 | 12.2711 | 713.3935m | n/a |
| RT3 | 12.0294 | 371.3819m | n/a |
| RT4 | 34.7170 | 787.5020m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CT1 | 2.3119m | 1.2136 | n/a |
| CT2 | 30.1500m | 2.6726m | n/a |
| CT3 | 967.4862m | 501.3570u | n/a |
| CT4 | 2.6158 | 8.2039m | 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 | 7.5244 | 646.1041m | n/a |
| RF2 | 11.4303 | 718.2059m | n/a |
| RF3 | 20.8012 | 396.7723m | n/a |
| RF4 | 23.2441 | 139.8980m | n/a |
| **THERMAL CAPACITANCE (Joules/°C)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CF1 | 4.2657m | 461.4456u | n/a |
| CF2 | 51.1875m | 2.2484m | n/a |
| CF3 | 813.7653m | 2.4743m | n/a |
| CF4 | 2.9288 | 70.0403m | n/a |

**Note**

- n/a indicates not applicable