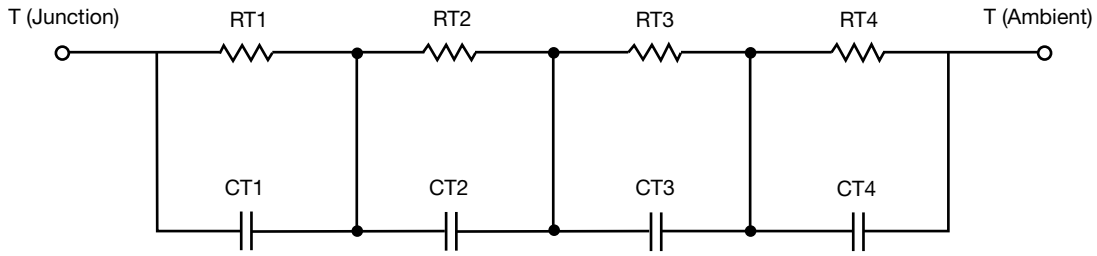
# R-C Thermal Model Parameters

## 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



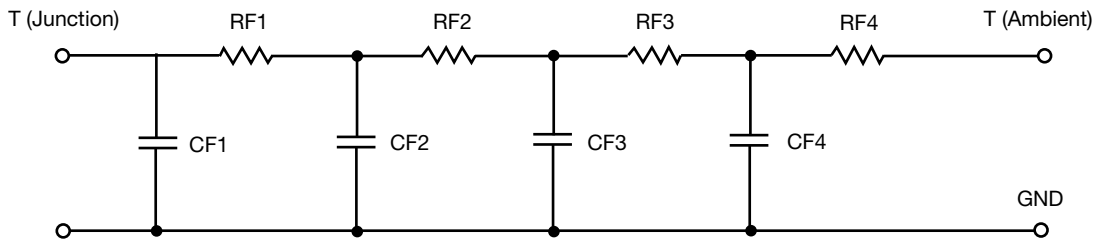

| R-C VALUES FOR TANK CONFIGURATION | | | |
|---|---|---|---|
| THERMAL RESISTANCE (°C/W) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| RT1 | 60.6277 | n/a | 9.0634 |
| RT2 | 16.9657 | n/a | 2.7529 |
| RT3 | 61.1678 | n/a | 7.5913 |
| RT4 | 25.7909 | n/a | 30.5800 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CT1 | 1.4462 | n/a | 4.1438m |
| CT2 | 268.8995m | n/a | 279.5026u |
| CT3 | 6.2161m | n/a | 235.0567m |
| CT4 | 1.1289m | n/a | 12.3990m |

**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 | 13.2515 | n/a | 4.5694 |
| RF2 | 47.7764 | n/a | 19.5812 |
| RF3 | 39.0007 | n/a | 23.0159 |
| RF4 | 63.8732 | n/a | 3.2135 |
| **THERMAL CAPACITANCE (Joules/°C)** | | | |
| **Junction to** | **Ambient** | **Case** | **Foot** |
| CF1 | 463.4177u | n/a | 418.9755u |
| CF2 | 2.0264m | n/a | 3.7740m |
| CF3 | 15.7869m | n/a | 15.4965m |
| CF4 | 1.1630 | n/a | 1.0248 |

**Note**

- n/a indicates not applicable