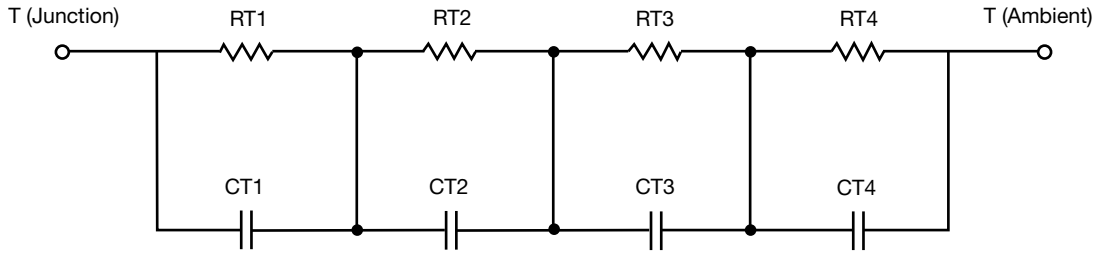
# R-C Thermal Model Parameters

## 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



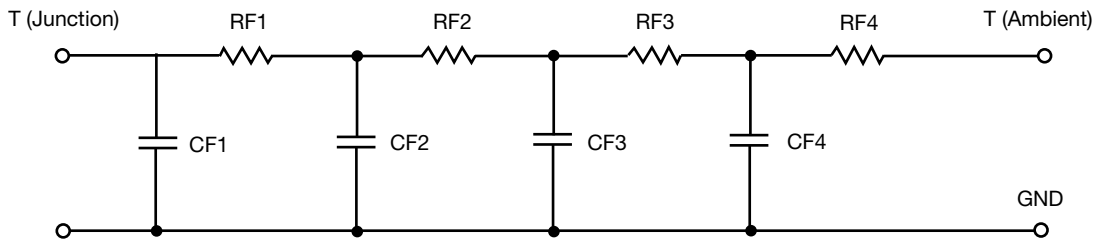

| R-C VALUES FOR TANK CONFIGURATION | | | | | |
|---|---|---|---|---|---|
| THERMAL RESISTANCE (°C/W) | | | | | |
| Junction to | Ambient | | Case | | Foot |
| | Channel 1 | Channel 2 | Channel 1 | Channel 2 | |
| RT1 | 7.5001 | 5.3180 | 2.6042 | 1.7660 | n/a |
| RT2 | 13.1238 | 12.2243 | 812.4787m | 590.0958m | n/a |
| RT3 | 14.2404 | 11.3386 | 248.0299m | 48.0739m | n/a |
| RT4 | 32.2818 | 31.2866 | 2.6386 | 1.3970 | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | | | |
| Junction to | Ambient | | Case | | Foot |
| | Channel 1 | Channel 2 | Channel 1 | Channel 2 | |
| CT1 | 541.9442u | 1.1995m | 891.4420u | 2.6473m | n/a |
| CT2 | 861.8346m | 917.3472m | 195.3999u | 203.5347u | n/a |
| CT3 | 18.7690m | 33.1963m | 1.0292 | 2.0908 | n/a |
| CT4 | 2.8612 | 2.9565 | 3.9101m | 1.6215m | 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 |
| | Channel 1 | Channel 2 | Channel 1 | Channel 2 | |
| RF1 | 9.3012 | 6.6210 | 1.2788 | 799.8159m | n/a |
| RF2 | 14.8200 | 11.9389 | 2.9391 | 2.2324 | n/a |
| RF3 | 27.6384 | 22.1659 | 1.5721 | 666.1334m | n/a |
| RF4 | 15.8118 | 19.7149 | 403.3005m | 113.5755m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | | | |
| Junction to | Ambient | | Case | | Foot |
| | Channel 1 | Channel 2 | Channel 1 | Channel 2 | |
| CF1 | 692.5013u | 1.5622m | 178.7722u | 216.5349u | n/a |
| CF2 | 26.3535m | 38.9398m | 545.3847u | 617.5766u | n/a |
| CF3 | 938.1882m | 826.9677m | 3.6965m | 8.2365m | n/a |
| CF4 | 6.2455 | 4.1277 | 33.2004m | 33.5205m | n/a |

**Note**

- n/a indicates not applicable