

R-C Thermal Model Parameters

DESCRIPTION

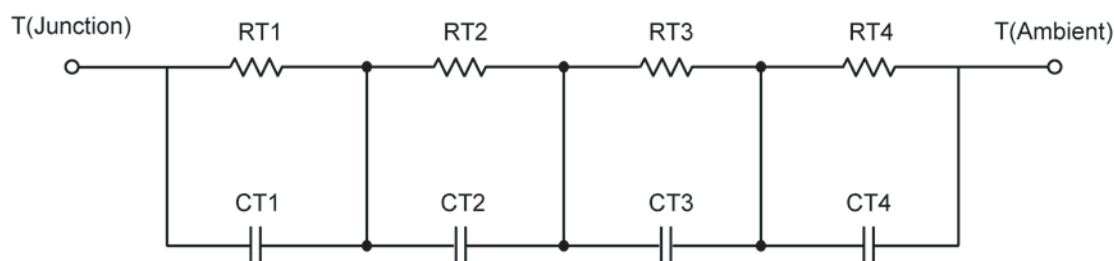
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

Note:

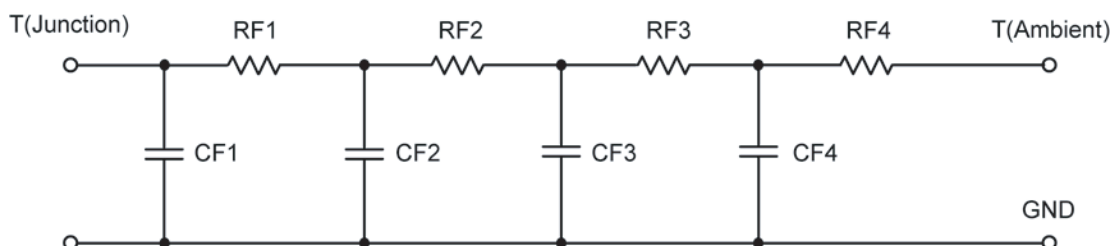
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



| R-C VALUES FOR TANK CONFIGURATION | | | |
|--|------------|------|------------|
| Thermal Resistance (°C/W) | | | |
| Junction to | Ambient | Case | Foot |
| RT1 | 23.2265 | N/A | 5.7631 |
| RT2 | 6.7205 | N/A | 952.9893 m |
| RT3 | 17.0899 | N/A | 6.3869 |
| RT4 | 48.3259 | N/A | 11.8993 |
| Thermal Capacitance (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 23.8003 m | N/A | 27.8936 m |
| CT2 | 10.3117 m | N/A | 3.3650 m |
| CT3 | 206.2464 m | N/A | 11.0918 m |
| CT4 | 1.4544 | N/A | 118.7165 m |

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 ($^{\circ}\text{C}/\text{W}$) | | | |
|--|------------|------|------------|
| Junction to | Ambient | Case | Foot |
| RF1 | 11.7111 | N/A | 3.8466 |
| RF2 | 20.5960 | N/A | 10.6704 |
| RF3 | 18.4481 | N/A | 10.0777 |
| RF4 | 44.1841 | N/A | 406.9401 m |
| Thermal Capacitance (Joules/ $^{\circ}\text{C}$) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 7.2348 m | N/A | 3.4863 m |
| CF2 | 12.3323 m | N/A | 6.4665 m |
| CF3 | 131.5624 m | N/A | 112.5067 m |
| CF4 | 1.3255 | N/A | 906.6078 m |

Note: NA indicates not applicable

Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002

