

R-C Thermal Model Parameters

DESCRIPTION

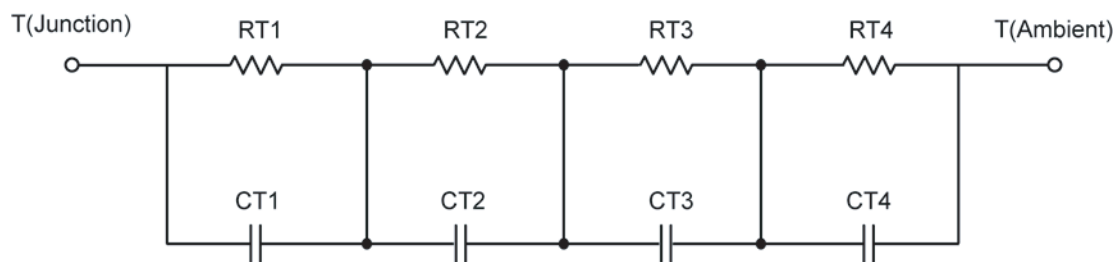
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse 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 | 16.6549 | N/A | 10.9296 |
| RT2 | 11.1784 | N/A | 5.0991 |
| RT3 | 28.9565 | N/A | 2.7739 |
| RT4 | 53.2102 | N/A | 17.1974 |
| Thermal Capacitance (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 95.3868 m | N/A | 16.9692 m |
| CT2 | 502.4189 u | N/A | 440.4814 u |
| CT3 | 5.9857 m | N/A | 1.0932 |
| CT4 | 1.5057 | N/A | 3.2693 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 | 13.1993 | N/A | 6.7881 |
| RF2 | 24.5081 | N/A | 11.7733 |
| RF3 | 19.9659 | N/A | 11.5527 |
| RF4 | 52.3267 | N/A | 5.8859 |
| Thermal Capacitance (Joules/ $^{\circ}\text{C}$) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 480.8460 u | N/A | 359.0530 u |
| CF2 | 4.4848 m | N/A | 2.0900 m |
| CF3 | 41.5902 m | N/A | 2.2689 m |
| CF4 | 1.4665 | N/A | 85.5765 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

