

R-C Thermal Model Parameters

DESCRIPTION

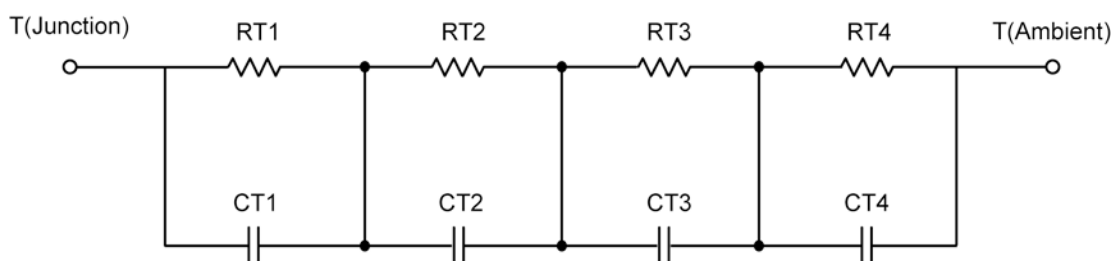
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse 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 | 3.7208 | 1.1030 | N/A |
| RT2 | 11.8695 | 1.3422 | N/A |
| RT3 | 9.3366 | 361.0000 m | N/A |
| RT4 | 60.0731 | 1.3938 | N/A |
| Thermal Capacitance (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 2.5348 m | 43.4290 m | N/A |
| CT2 | 167.8336 m | 826.1972 u | N/A |
| CT3 | 23.1652 m | 33.3835 | N/A |
| CT4 | 1.0448 | 3.5063 m | N/A |

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 (°C/W) | | | |
|---------------------------------|------------|------------|------|
| Junction to | Ambient | Case | Foot |
| RF1 | 4.2973 | 1.2451 | N/A |
| RF2 | 12.7425 | 1.4918 | N/A |
| RF3 | 13.4578 | 1.0762 | N/A |
| RF4 | 54.5024 | 386.9000 m | N/A |
| Thermal Capacitance (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 1.9955 m | 569.2014 u | N/A |
| CF2 | 18.8804 m | 1.1336 m | N/A |
| CF3 | 193.2682 m | 31.2964 m | N/A |
| CF4 | 925.3995 m | 18.4761 | N/A |

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

