

## R-C Thermal Model Parameters

### DESCRIPTION

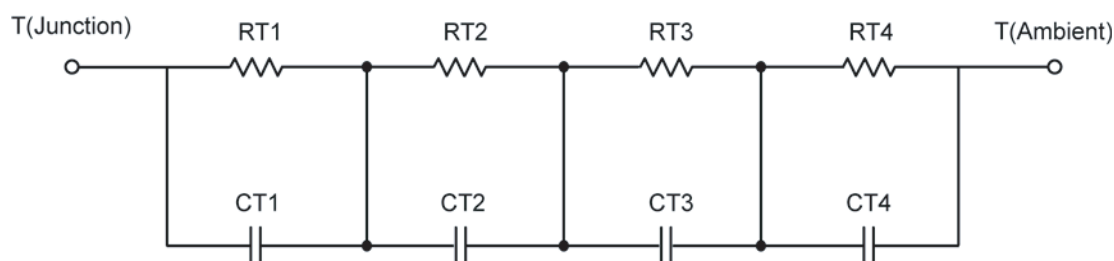
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

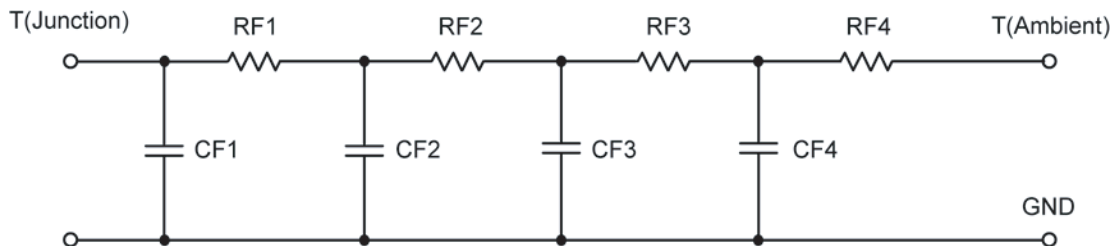
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

### R-C THERMAL MODEL FOR TANK CONFIGURATION



| R-C VALUES FOR TANK CONFIGURATION |           |      |            |
|-----------------------------------|-----------|------|------------|
| Thermal Resistance (°C/W)         |           |      |            |
| Junction to                       | Ambient   | Case | Foot       |
| RT1                               | 4.9280    | N/A  | 536.3249 m |
| RT2                               | 26.4288   | N/A  | 4.6553     |
| RT3                               | 26.4135   | N/A  | 10.1038    |
| RT4                               | 27.3492   | N/A  | 5.6867     |
| Thermal Capacitance (Joules/°C)   |           |      |            |
| Junction to                       | Ambient   | Case | Foot       |
| CT1                               | 7.0702 m  | N/A  | 644.2123 μ |
| CT2                               | 45.4725 m | N/A  | 65.5331 m  |
| CT3                               | 1.8744    | N/A  | 157.8483 m |
| CT4                               | 4.2541    | N/A  | 10.8807 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 (°C/W)       |            |      |            |
|---------------------------------|------------|------|------------|
| Junction to                     | Ambient    | Case | Foot       |
| RF1                             | 2.6273     | N/A  | 2.7852     |
| RF2                             | 27.5087    | N/A  | 8.1195     |
| RF3                             | 23.0822    | N/A  | 5.8581     |
| RF4                             | 31.8094    | N/A  | 4.2091     |
| Thermal Capacitance (Joules/°C) |            |      |            |
| Junction to                     | Ambient    | Case | Foot       |
| CF1                             | 1.0532 m   | N/A  | 3.5316 m   |
| CF2                             | 30.2590 m  | N/A  | 10.7913 m  |
| CF3                             | 783.3855 m | N/A  | 104.4945 m |
| CF4                             | 1.7732     | N/A  | 59.3930 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



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