



# 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 PSpice, 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 PSpice 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 PSpice Platform".

## R-C THERMAL MODEL FOR TANK CONFIGURATION



| R-C VALUES FOR TANK CONFIGURATION |         |           |      |
|-----------------------------------|---------|-----------|------|
| THERMAL RESISTANCE (°C/W)         |         |           |      |
| Junction to                       | Ambient | Case      | Foot |
| RT1                               | n/a     | 1.9082    | n/a  |
| RT2                               | n/a     | 340.2673m | n/a  |
| RT3                               | n/a     | 696.5004m | n/a  |
| RT4                               | n/a     | 1.0550    | n/a  |
| THERMAL CAPACITANCE (Joules/°C)   |         |           |      |
| Junction to                       | Ambient | Case      | Foot |
| CT1                               | n/a     | 629.3689m | n/a  |
| CT2                               | n/a     | 2.1813m   | n/a  |
| CT3                               | n/a     | 8.9947m   | n/a  |
| CT4                               | n/a     | 1.1410    | 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 |
| RF1                                 | n/a     | 689.8301m | n/a  |
| RF2                                 | n/a     | 421.3642m | n/a  |
| RF3                                 | n/a     | 2.1184    | n/a  |
| RF4                                 | n/a     | 770.4060m | n/a  |
| THERMAL CAPACITANCE (Joules/°C)     |         |           |      |
| Junction to                         | Ambient | Case      | Foot |
| CF1                                 | n/a     | 2.0324m   | n/a  |
| CF2                                 | n/a     | 26.7228m  | n/a  |
| CF3                                 | n/a     | 381.1698m | n/a  |
| CF4                                 | n/a     | 93.5107m  | n/a  |

Note

- n/a indicates not applicable

