



# 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                               | 17.1276   | 88.3471m  | n/a  |
| RT2                               | 18.7934   | 171.3226m | n/a  |
| RT3                               | 3.4460    | 2.2951m   | n/a  |
| RT4                               | 633.0000m | 138.0352m | n/a  |
| THERMAL CAPACITANCE (Joules/°C)   |           |           |      |
| Junction to                       | Ambient   | Case      | Foot |
| CT1                               | 6.0385    | 64.3941m  | n/a  |
| CT2                               | 4.8418    | 218.6491m | n/a  |
| CT3                               | 1.0801    | 1.9142    | n/a  |
| CT4                               | 135.5474m | 8.7820m   | 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                                 | 395.9000m | 7.2445m   | n/a  |
| RF2                                 | 3.6827    | 56.2404m  | n/a  |
| RF3                                 | 29.4697   | 155.7909m | n/a  |
| RF4                                 | 6.4517    | 179.4882m | n/a  |
| THERMAL CAPACITANCE (Joules/°C)     |           |           |      |
| Junction to                         | Ambient   | Case      | Foot |
| CF1                                 | 18.0023m  | 5.4356m   | n/a  |
| CF2                                 | 420.7831m | 82.7145u  | n/a  |
| CF3                                 | 1.9529    | 5.6356m   | n/a  |
| CF4                                 | 6.2882    | 144.2955m | n/a  |

Note

- n/a indicates not applicable

