

## 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 P-SPICE, 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 P-SPICE 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 P-SPICE Platform".

### R-C THERMAL MODEL FOR TANK CONFIGURATION

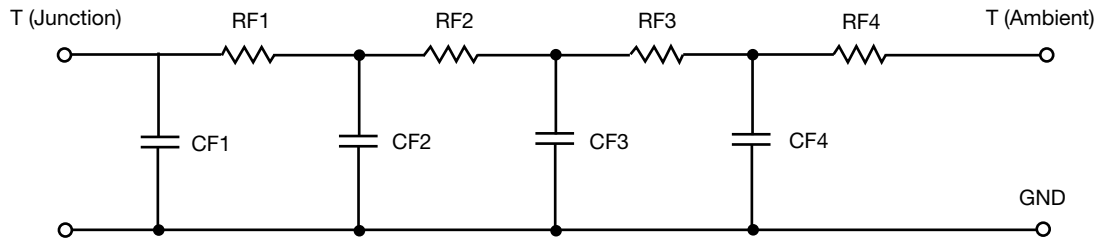


| R-C VALUES FOR TANK CONFIGURATION |           |           |      |
|-----------------------------------|-----------|-----------|------|
| THERMAL RESISTANCE (°C/W)         |           |           |      |
| Junction to                       | Ambient   | Case      | Foot |
| RT1                               | 14.5380   | 1.1278m   | N/A  |
| RT2                               | 24.4900   | 51.4366m  | N/A  |
| RT3                               | 14.5510   | 4.9136    | N/A  |
| RT4                               | 51.4210   | 4.5126    | N/A  |
| THERMAL CAPACITANCE (Joules/°C)   |           |           |      |
| Junction to                       | Ambient   | Case      | Foot |
| CT1                               | 269.9908u | 5.4337u   | N/A  |
| CT2                               | 4.5827m   | 1.1487m   | N/A  |
| CT3                               | 185.6769m | 65.6663u  | N/A  |
| CT4                               | 1.4859    | 333.4860u | 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**

| <b>R-C VALUES FOR FILTER CONFIGURATION</b> |                |             |             |
|--|----------------|-------------|-------------|
| <b>THERMAL RESISTANCE (°C/W)</b>           |                |             |             |
| <b>Junction to</b>                         | <b>Ambient</b> | <b>Case</b> | <b>Foot</b> |
| RF1  | 14.2399        | 2.7405      | N/A         |
| RF2  | 26.7362        | 4.8557      | N/A         |
| RF3  | 18.7649        | 148.0019m   | N/A         |
| RF4  | 45.2590        | 1.7443      | N/A         |
| <b>THERMAL CAPACITANCE (Joules/°C)</b>     |                |             |             |
| <b>Junction to</b>                         | <b>Ambient</b> | <b>Case</b> | <b>Foot</b> |
| CF1  | 217.8029u      | 32.0110u    | N/A         |
| CF2  | 3.6830m        | 77.9058u    | N/A         |
| CF3  | 208.5384m      | 542.5505u   | N/A         |
| CF4  | 1.5514         | 15.9981u    | N/A         |

**Note**

N/A indicates not applicable

