

## 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                               | 10.9934    | 187.1768 m | N/A  |
| RT2                               | 20.2758    | 5.1737     | N/A  |
| RT3                               | 18.0671    | 15.3922 m  | N/A  |
| RT4                               | 30.6637    | 2.6433     | N/A  |
| THERMAL CAPACITANCE (Joules/°C)   |            |            |      |
| Junction to                       | Ambient    | Case       | Foot |
| CT1                               | 257.4576 u | 49.2787 m  | N/A  |
| CT2                               | 9.9208 m   | 217.4666 u | N/A  |
| CT3                               | 714.4509 m | 192.0199 m | N/A  |
| CT4                               | 3.4114     | 74.0780 u  | 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                             | 11.7271    | 4.3719     | N/A  |
| RF2                             | 19.0098    | 3.5022     | N/A  |
| RF3                             | 20.9255    | 172.0566 m | N/A  |
| RF4                             | 28.3376    | 3.7595 m   | N/A  |
| THERMAL CAPACITANCE (Joules/°C) |            |            |      |
| Junction to                     | Ambient    | Case       | Foot |
| CF1                             | 262.0356 u | 55.3592 u  | N/A  |
| CF2                             | 9.2016 m   | 232.5279 u | N/A  |
| CF3                             | 437.7307 m | 135.0816 m | N/A  |
| CF4                             | 2.7220     | 72.2070 m  | N/A  |

**Note**

N/A indicates not applicable

