

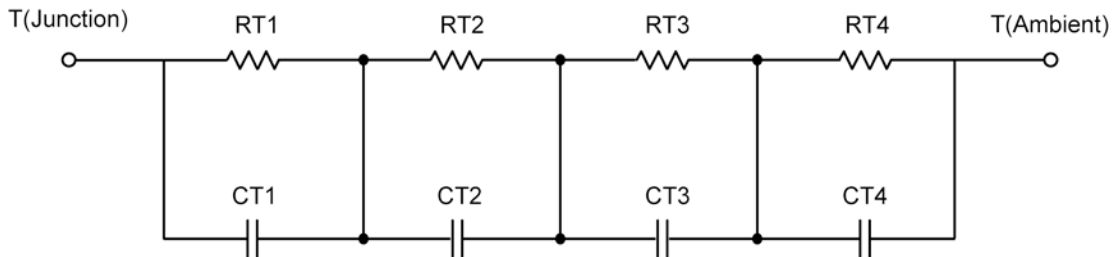
## R-C Thermal Model Parameters

### 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



| <b>R-C VALUES FOR TANK CONFIGURATION</b> |           |      |            |
|--|-----------|------|------------|
| Thermal Resistance (°C/W)                |           |      |            |
| Junction to                              | Ambient   | Case | Foot       |
| RT1                                      | 33.0641   | N/A  | 14.9622    |
| RT2                                      | 13.4089   | N/A  | 6.3424     |
| RT3                                      | 30.6996   | N/A  | 20.6505    |
| RT4                                      | 52.8274   | N/A  | 3.0449     |
| Thermal Capacitance (Joules/°C)          |           |      |            |
| Junction to                              | Ambient   | Case | Foot       |
| CT1                                      | 1.3067 m  | N/A  | 314.7666 u |
| CT2                                      | 85.2596 u | N/A  | 45.9858 u  |
| CT3                                      | 28.1248 m | N/A  | 971.9596 u |
| CT4                                      | 1.7149    | N/A  | 51.9837 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 ( $^{\circ}\text{C}/\text{W}$ ) |           |      |            |
|--|-----------|------|------------|
| Junction to  | Ambient   | Case | Foot       |
| RF1  | 16.3112   | N/A  | 11.0190    |
| RF2  | 35.2453   | N/A  | 25.0270    |
| RF3  | 27.2518   | N/A  | 8.6902     |
| RF4  | 51.1917   | N/A  | 263.8000 m |
| Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )  |           |      |            |
| Junction to  | Ambient   | Case | Foot       |
| CF1  | 89.4278 u | N/A  | 45.9914 u  |
| CF2  | 1.3321 m  | N/A  | 284.9028 u |
| CF3  | 36.0319 m | N/A  | 4.2431 m   |
| CF4  | 1.7520    | N/A  | 191.5169 m |

**Note**

NA indicates not applicable

