

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 | 3.7181 | 520.4174 m | N/A |
| RT2 | 7.8179 | 204.6692 m | N/A |
| RT3 | 9.2726 | 671.4163 m | N/A |
| RT4 | 44.1914 | 103.4971 m | N/A |
| Thermal Capacitance (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 32.6883 m | 33.0457 m | N/A |
| CT2 | 104.7284 m | 1.2949 m | N/A |
| CT3 | 1.1804 | 23.7693 m | N/A |
| CT4 | 1.6137 | 15.3478 m | N/A |

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 | 5.3381 | 96.9521 m | N/A |
| RF2 | 9.0265 | 369.0229 m | N/A |
| RF3 | 8.0464 | 463.8063 m | N/A |
| RF4 | 42.5890 | 570.2187 m | N/A |
| Thermal Capacitance (Joules/ $^{\circ}\text{C}$) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 21.1671 m | 723.1322 u | N/A |
| CF2 | 86.9363 m | 2.1560 m | N/A |
| CF3 | 419.7924 m | 12.5889 m | N/A |
| CF4 | 925.1198 m | 1.5335 m | N/A |

Note

NA indicates not applicable

