



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 | 1.6014 | 1.2054 | n/a |
| RT2 | 14.1269 | 169.5245m | n/a |
| RT3 | 7.4603 | 901.7444m | n/a |
| RT4 | 26.8102 | 923.3311m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 1.7664m | 9.1470m | n/a |
| CT2 | 729.9909m | 1.0544m | n/a |
| CT3 | 47.9093m | 106.2844m | n/a |
| CT4 | 2.3598 | 1.2595m | 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 | 1.5901 | 710.4848m | n/a |
| RF2 | 8.5659 | 829.9083m | n/a |
| RF3 | 19.6871 | 1.0209 | n/a |
| RF4 | 19.8767 | 638.7069m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 1.3634m | 573.1689u | n/a |
| CF2 | 41.4004m | 1.5115m | n/a |
| CF3 | 495.5471m | 9.3169m | n/a |
| CF4 | 2.2199 | 144.4089m | n/a |

Note

- n/a indicates not applicable

