

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 | 1.6085 | 202.9628m | n/a |
| RT2 | 9.2677 | 831.8710m | n/a |
| RT3 | 6.9452 | 94.1601m | n/a |
| RT4 | 32.1786 | 271.0061m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 6.3421m | 2.2734m | n/a |
| CT2 | 1.6438 | 41.9948m | n/a |
| CT3 | 81.9262m | 14.7360m | n/a |
| CT4 | 2.8561 | 117.8329m | 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 | 2.8523 | 288.5594m | n/a |
| RF2 | 6.9704 | 32.1247m | n/a |
| RF3 | 11.7651 | 202.5601m | n/a |
| RF4 | 28.4122 | 876.7558m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 8.6375m | 1.8538m | n/a |
| CF2 | 102.1624m | 7.0132m | n/a |
| CF3 | 737.6105m | 13.2897m | n/a |
| CF4 | 1.9250 | 12.8982m | n/a |

Note

- n/a indicates not applicable

