



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 | 20.0898 | 259.6992m | n/a |
| RT2 | 10.8658 | 389.2086m | n/a |
| RT3 | 4.2278 | 341.0731m | n/a |
| RT4 | 29.8165 | 310.0191m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 1.1451 | 20.3988u | n/a |
| CT2 | 98.4862m | 246.1236u | n/a |
| CT3 | 5.1886m | 1.8019m | n/a |
| CT4 | 4.1790 | 2.0487m | 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 | 3.7467 | 386.1677m | n/a |
| RF2 | 11.9474 | 665.4470m | n/a |
| RF3 | 25.2214 | 188.0016m | n/a |
| RF4 | 24.0845 | 60.3837m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 3.5690m | 21.5195u | n/a |
| CF2 | 64.3580m | 313.3796u | n/a |
| CF3 | 682.9363m | 2.0571m | n/a |
| CF4 | 3.7516 | 7.4638m | n/a |

Note

- n/a indicates not applicable

