



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 | 4.0515 | 1.3859 | n/a |
| RT2 | 11.7292 | 74.3340m | n/a |
| RT3 | 6.3776 | 20.4535m | n/a |
| RT4 | 42.6256 | 312.9663m | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 15.5965m | 32.2480m | n/a |
| CT2 | 596.2797m | 19.7810u | n/a |
| CT3 | 124.1204m | 119.3014m | n/a |
| CT4 | 1.9359 | 8.9230m | 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 | 4.2939 | 128.7832m | n/a |
| RF2 | 12.0622 | 301.5352m | n/a |
| RF3 | 26.0869 | 330.1959m | n/a |
| RF4 | 22.6427 | 1.0351 | n/a |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 10.5204m | 2.5423m | n/a |
| CF2 | 86.9540m | 2.7093m | n/a |
| CF3 | 805.9547m | 12.8435m | n/a |
| CF4 | 2.9201 | 21.3257m | n/a |

Note

- n/a indicates not applicable

