

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 | 21.9977 | N/A | 8.0452 |
| RT2 | 65.0809 | N/A | 9.1444 |
| RT3 | 17.4952 | N/A | 28.1784 |
| RT4 | 60.1691 | N/A | 4.3217 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 1.0252m | N/A | 19.8009m |
| CT2 | 5.3794m | N/A | 8.6162m |
| CT3 | 279.8746m | N/A | 24.1847m |
| CT4 | 1.4942 | N/A | 548.2116u |

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 | 37.0401 | N/A | 5.5922 |
| RF2 | 54.7344 | N/A | 14.0345 |
| RF3 | 21.8682 | N/A | 12.3087 |
| RF4 | 51.2353 | N/A | 17.7649 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 974.7637u | N/A | 684.5656u |
| CF2 | 6.4804m | N/A | 3.7143m |
| CF3 | 306.0003m | N/A | 3.9848m |
| CF4 | 1.4520 | N/A | 26.6315m |

Note

N/A indicates not applicable

