

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 | 8.2815 | N/A | 11.0831 |
| RT2 | 30.3644 | N/A | 3.8285 |
| RT3 | 23.2924 | N/A | 11.4483 |
| RT4 | 47.5183 | N/A | 8.4826 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 487.0120u | N/A | 28.1584m |
| CT2 | 5.2238m | N/A | 288.3764u |
| CT3 | 43.9265m | N/A | 4.2515m |
| CT4 | 1.4539 | N/A | 6.9515m |

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 | 16.9694 | N/A | 5.3220 |
| RF2 | 42.1611 | N/A | 19.4480 |
| RF3 | 30.4457 | N/A | 3.8642 |
| RF4 | 20.2879 | N/A | 6.3658 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 783.3019u | N/A | 309.0180u |
| CF2 | 8.0964m | N/A | 2.1366m |
| CF3 | 907.1767m | N/A | 5.7175m |
| CF4 | 2.9791 | N/A | 52.6932m |

Note

N/A indicates not applicable

