

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 | 20.8369 | N/A | 5.4283 |
| RT2 | 6.2505 | N/A | 8.8890 |
| RT3 | 16.9980 | N/A | 5.6926 |
| RT4 | 40.9146 | N/A | 4.9901 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | 349.6788 m | N/A | 137.5035 m |
| CT2 | 471.2139 u | N/A | 11.6764 m |
| CT3 | 20.7583 m | N/A | 1.9521 m |
| CT4 | 2.6296 | N/A | 138.5223 u |

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 | 6.4674 | N/A | 5.8106 |
| RF2 | 17.7225 | N/A | 6.5174 |
| RF3 | 22.8037 | N/A | 7.9891 |
| RF4 | 38.0064 | N/A | 4.6829 |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | 445.4930 u | N/A | 132.2512 u |
| CF2 | 17.6454 m | N/A | 1.5505 m |
| CF3 | 244.3055 m | N/A | 9.2501 m |
| CF4 | 2.3329 | N/A | 117.6707 m |

Note

N/A indicates not applicable

