

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 | N/A | 206.8963m | N/A |
| RT2 | N/A | 395.9902m | N/A |
| RT3 | N/A | 227.3667m | N/A |
| RT4 | N/A | 170.3569m | N/A |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CT1 | N/A | 222.1626m | N/A |
| CT2 | N/A | 62.2638m | N/A |
| CT3 | N/A | 371.7826m | N/A |
| CT4 | N/A | 5.4771m | 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



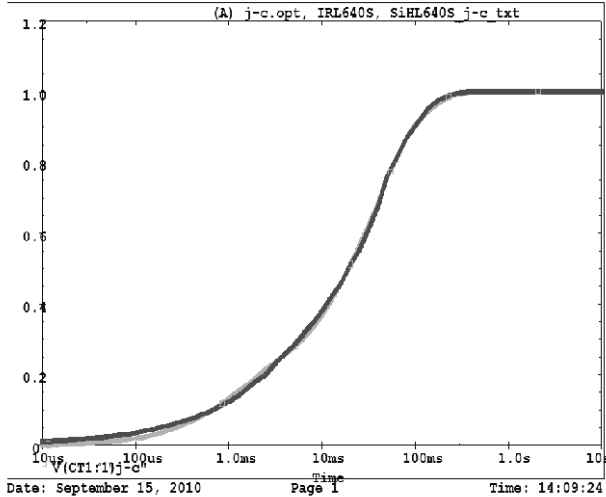
| R-C VALUES FOR FILTER CONFIGURATION | | | |
|-------------------------------------|---------|-----------|------|
| THERMAL RESISTANCE (°C/W) | | | |
| Junction to | Ambient | Case | Foot |
| RF1 | N/A | 209.8292m | N/A |
| RF2 | N/A | 296.0633m | N/A |
| RF3 | N/A | 286.4369m | N/A |
| RF4 | N/A | 205.5016m | N/A |
| THERMAL CAPACITANCE (Joules/°C) | | | |
| Junction to | Ambient | Case | Foot |
| CF1 | N/A | 5.2686m | N/A |
| CF2 | N/A | 27.2196m | N/A |
| CF3 | N/A | 50.8257m | N/A |
| CF4 | N/A | 11.4582m | N/A |

Note

N/A indicates not applicable



IRL640S, SiHL640S Tank j-c Temperature: 27.0



IRL640S, SiHL640S Filter j-c Temperature: 27.0

