



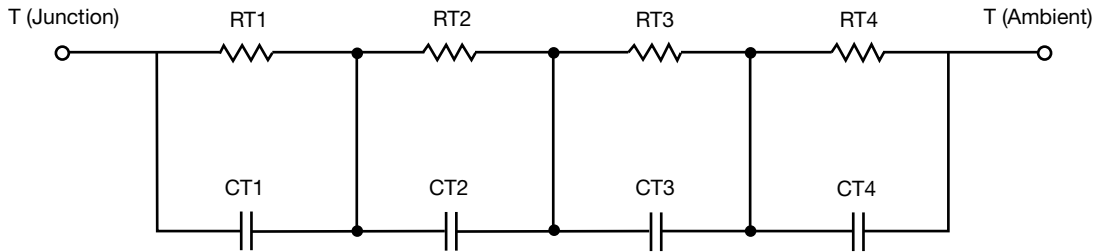
# R-C Thermal Model Parameters

## 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-Full Copper | Ambient-Minimum Copper | Foot |
| RT1                               | 45.1574             | 85.6698                | N/A  |
| RT2                               | 49.8165             | 78.1846                | N/A  |
| RT3                               | 20.8788             | 83.8800                | N/A  |
| RT4                               | 67.5214             | 78.7147                | N/A  |
| THERMAL CAPACITANCE (Joules/°C)   |                     |                        |      |
| Junction to                       | Ambient-Full Copper | Ambient-Minimum Copper | Foot |
| CT1                               | 1.6266              | 273.5475m              | N/A  |
| CT2                               | 2.3031m             | 240.8119u              | N/A  |
| CT3                               | 172.9350m           | 1.7372m                | N/A  |
| CT4                               | 146.4748u           | 12.7476m               | 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-Full Copper | Ambient-Minimum Copper | Foot |
| RF1                                 | 54.6183             | 96.3154                | N/A  |
| RF2                                 | 55.7808             | 91.2010                | N/A  |
| RF3                                 | 28.4438             | 66.3965                | N/A  |
| RF4                                 | 44.5902             | 73.0078                | N/A  |
| THERMAL CAPACITANCE (Joules/°C)     |                     |                        |      |
| Junction to                         | Ambient-Full Copper | Ambient-Minimum Copper | Foot |
| CF1                                 | 109.3494u           | 199.2948u              | N/A  |
| CF2                                 | 758.8691u           | 1.3740m                | N/A  |
| CF3                                 | 59.9059m            | 18.9916m               | N/A  |
| CF4                                 | 1.5317              | 326.6633m              | N/A  |

Note

- n/a indicates not applicable

