

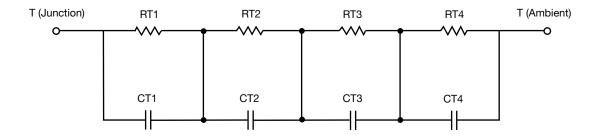
# **R-C Thermal Model Parameters**

## **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**



| THERMAL RESISTANCE (°C/W) |               |                    |      |  |  |
|---------------------------|---------------|--------------------|------|--|--|
| Junction to               | Ambient       | Case               | Foot |  |  |
| RT1                       | 27.1344       | 158.3239m          | N/A  |  |  |
| RT2                       | 16.1722       | 286.4966m          | N/A  |  |  |
| RT3                       | 8.4502        | 1.3144             | N/A  |  |  |
| RT4                       | 33.3465       | 934.2857m          | N/A  |  |  |
|                           | THERMAL CAPAC | ITANCE (Joules/°C) |      |  |  |
| Junction to               | Ambient       | Case               | Foot |  |  |
| CT1                       | 1.4889        | 1.5890m            | N/A  |  |  |
| CT2                       | 52.4679m      | 1.0159             | N/A  |  |  |
| CT3                       | 1.8785m       | 10.1722m           | N/A  |  |  |
| CT4                       | 2.8957        | 155.2922m          | N/A  |  |  |

#### Note

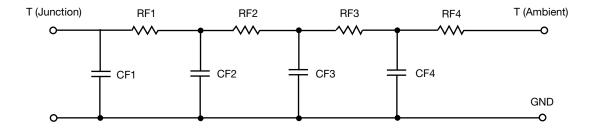
• n/a indicates not applicable

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.

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## **R-C THERMAL MODEL FOR FILTER CONFIGURATION**



| R-C VALUES FOR FILTER CONFIGURATION |               |                    |      |  |  |  |
|-------------------------------------|---------------|--------------------|------|--|--|--|
| THERMAL RESISTANCE (°C/W)           |               |                    |      |  |  |  |
| Junction to                         | Ambient       | Case               | Foot |  |  |  |
| RF1                                 | 9.2346        | 630.5397m          | N/A  |  |  |  |
| RF2                                 | 18.1388       | 995.4087m          | N/A  |  |  |  |
| RF3                                 | 33.5322       | 702.0734m          | N/A  |  |  |  |
| RF4                                 | 23.6356       | 359.0002m          | N/A  |  |  |  |
|                                     | THERMAL CAPAC | ITANCE (Joules/°C) |      |  |  |  |
| Junction to                         | Ambient       | Case               | Foot |  |  |  |
| CF1                                 | 1.8170m       | 3.8498m            | N/A  |  |  |  |
| CF2                                 | 53.2733m      | 9.7489m            | N/A  |  |  |  |
| CF3                                 | 1.0683        | 126.6362m          | N/A  |  |  |  |
| CF4                                 | 202.9004m     | 922.8251u          | N/A  |  |  |  |

### Note

• n/a indicates not applicable

