

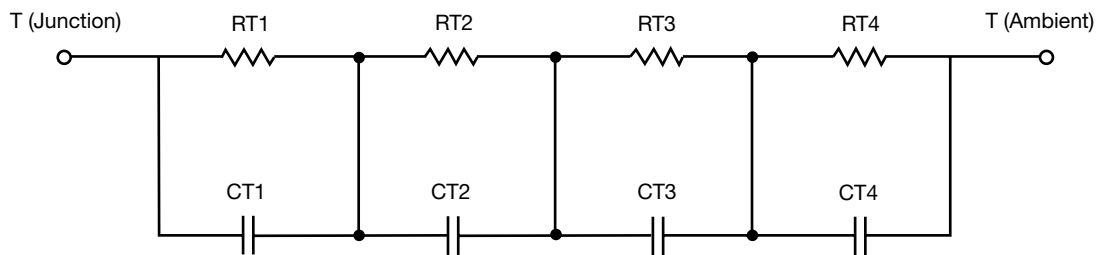
## R-C Thermal Model Parameters

### 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                               | 1.4498    | 920.6084m | N/A  |
| RT2                               | 29.6544   | 1.3167    | N/A  |
| RT3                               | 11.7613   | 1.1059    | N/A  |
| RT4                               | 6.7669    | 1.1708    | N/A  |
| THERMAL CAPACITANCE (Joules/°C)   |           |           |      |
| Junction to                       | Ambient   | Case      | Foot |
| CT1                               | 2.0337m   | 1.3139    | N/A  |
| CT2                               | 1.8428    | 6.5196m   | N/A  |
| CT3                               | 604.6069m | 70.5420m  | N/A  |
| CT4                               | 41.6849m  | 653.7104u | N/A  |

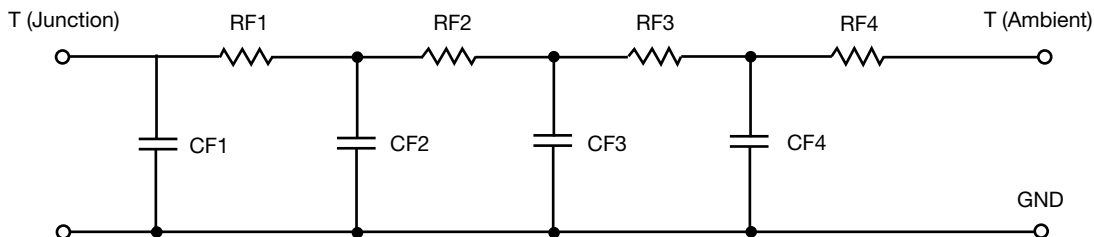
#### Note

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**



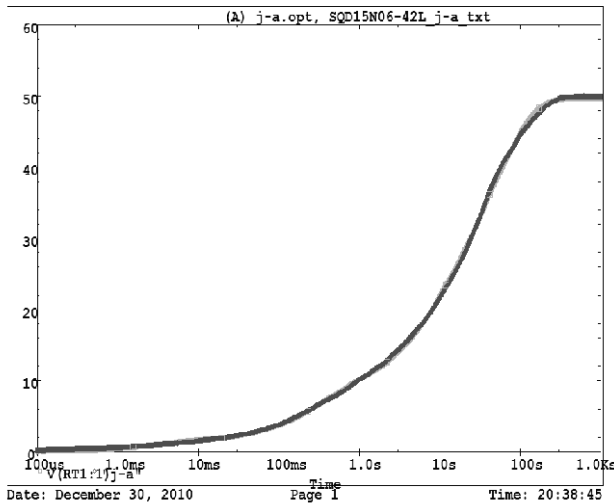
| <b>R-C VALUES FOR FILTER CONFIGURATION</b> |                |             |             |
|--|----------------|-------------|-------------|
| <b>THERMAL RESISTANCE (°C/W)</b>           |                |             |             |
| <b>Junction to</b>                         | <b>Ambient</b> | <b>Case</b> | <b>Foot</b> |
| RF1  | 3.3161         | 1.1720      | N/A         |
| RF2  | 8.5954         | 1.2052      | N/A         |
| RF3  | 16.9972        | 1.0158      | N/A         |
| RF4  | 20.6600        | 1.0710      | N/A         |
| <b>THERMAL CAPACITANCE (Joules/°C)</b>     |                |             |             |
| <b>Junction to</b>                         | <b>Ambient</b> | <b>Case</b> | <b>Foot</b> |
| CF1  | 6.0642m        | 503.9403u   | N/A         |
| CF2  | 72.1314m       | 3.4649m     | N/A         |
| CF3  | 520.8259m      | 28.2813m    | N/A         |
| CF4  | 1.7643         | 599.1817m   | N/A         |

**Note**

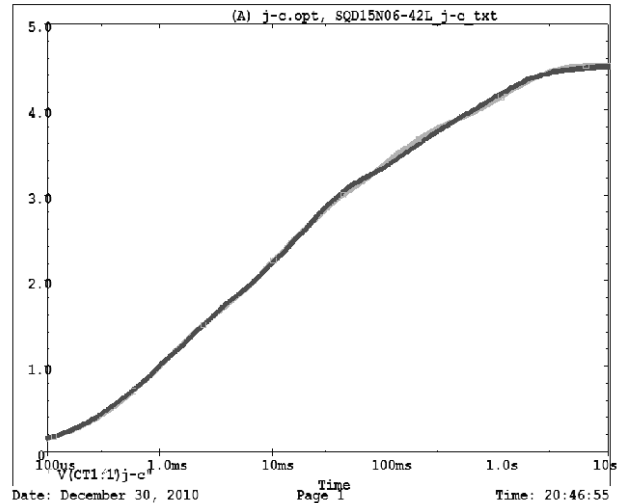
N/A indicates not applicable



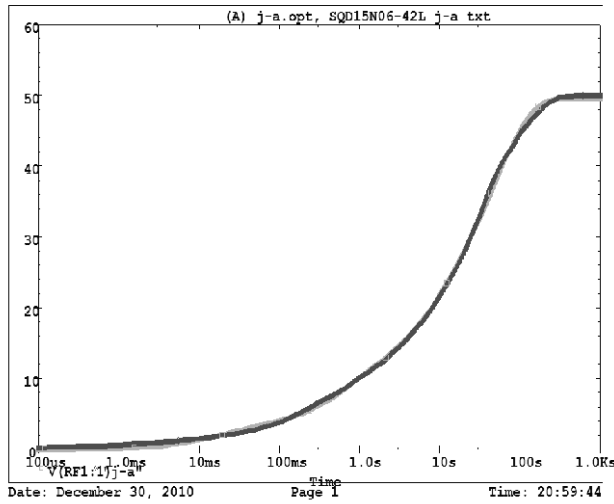
SQD15N06-42L Tank j-a Temperature: 27.0



SQD15N06-42L Tank j-c Temperature: 27.0



SQD15N06-42L Filter j-a Temperature: 27.0



SQD15N06-42L Filter j-c Temperature: 27.0

