



## R-C Thermal Model Parameters

### DESCRIPTION

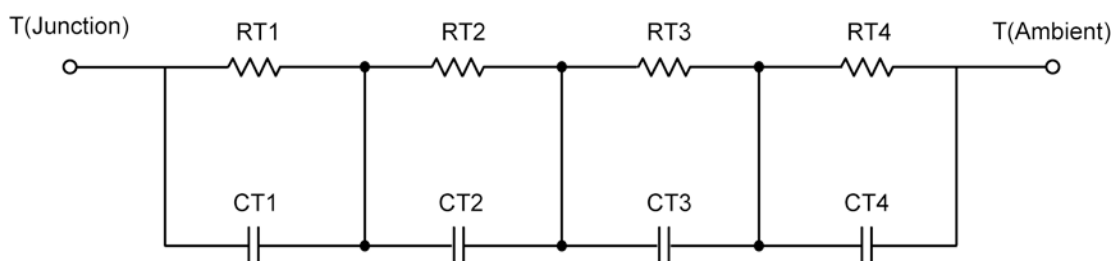
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

*Note:*

*For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).*

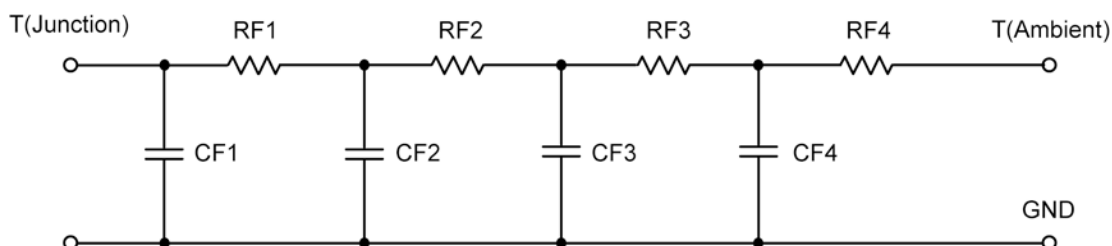
### R-C THERMAL MODEL FOR TANK CONFIGURATION



| R-C VALUES FOR TANK CONFIGURATION |                 |                            |      |
|-----------------------------------|-----------------|----------------------------|------|
| Thermal Resistance (°C/W)         |                 |                            |      |
| Junction to                       | Ambient TN2404K | Ambient TN2404KL & BS107KL | Foot |
| RT1                               | 15.6218         | 61.8675                    | N/A  |
| RT2                               | 206.5664        | 9.6727                     | N/A  |
| RT3                               | 65.3515         | 14.8318                    | N/A  |
| RT4                               | 62.4603         | 69.6280                    | N/A  |
| Thermal Capacitance (Joules/°C)   |                 |                            |      |
| Junction to                       | Ambient TN2404K | Ambient TN2404KL & BS107KL | Foot |
| CT1                               | 90.3666 $\mu$   | 3.6608                     | N/A  |
| CT2                               | 2.9922 m        | 16.5455 m                  | N/A  |
| CT3                               | 911.1518 $\mu$  | 529.0014 m                 | N/A  |
| CT4                               | 946.6489 m      | 44.0437                    | N/A  |

*This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet 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 TN2404K | Ambient TN2404KL & BS107KL | Foot |
| RF1                             | 47.9694         | 9.6486                     | N/A  |
| RF2                             | 108.8884        | 20.2145                    | N/A  |
| RF3                             | 134.5175        | 67.6141                    | N/A  |
| RF4                             | 58.6247         | 58.5228                    | N/A  |
| Thermal Capacitance (Joules/°C) |                 |                            |      |
| Junction to                     | Ambient TN2404K | Ambient TN2404KL & BS107KL | Foot |
| CF1                             | 224.4597 u      | 14.1387 m                  | N/A  |
| CF2                             | 941.2509 u      | 414.3842 m                 | N/A  |
| CF3                             | 3.5379 m        | 3.2403                     | N/A  |
| CF4                             | 1.1487          | 48.7029                    | N/A  |

Note: NA indicates not applicable

#### Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya. IEEE / SEMITHERM 2002

