

## R-C Thermal Model Parameters

### DESCRIPTION

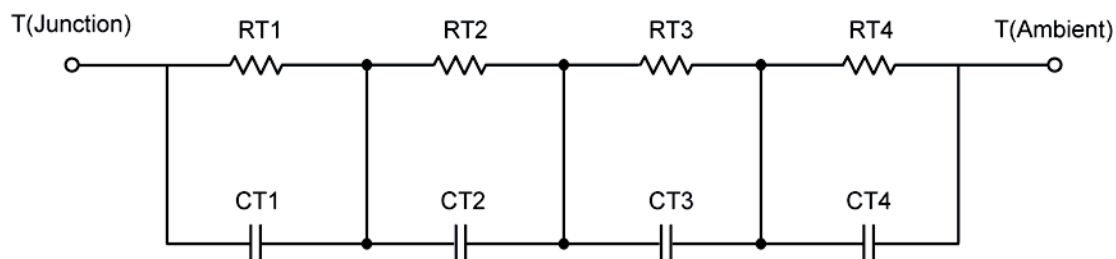
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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



<b>R-C VALUES FOR TANK CONFIGURATION</b>					
Thermal Resistance (°C/W)					
Junction to	Ambient Ch1	Ambient Ch2	Case	Foot Ch1	Foot Ch2
RT1	54.8842	52.2946	N/A	12.1500	25.3252
RT2	29.4964	8.7466	N/A	5.1562	2.4693
RT3	18.4819	31.0163	N/A	9.6674	15.4441
RT4	6.8802	27.5612	N/A	12.9979	6.5508
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Ch1	Ambient Ch2	Case	Foot Ch1	Foot Ch2
CT1	1.3522	1.5115	N/A	9.5372 m	3.7227 m
CT2	55.0173 m	237.7467 u	N/A	352.1553 u	1.9238 m
CT3	13.4487 m	77.7767 m	N/A	53.2271 m	70.1255 m
CT4	1.8083 m	8.1745 m	N/A	3.4701 m	494.7954 u

*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 ( $^{\circ}\text{C}/\text{W}$ )					
Junction to	Ambient Ch1	Ambient Ch2	Case	Foot Ch1	Foot Ch2
RF1	17.5401	9.0563	N/A	8.0392	8.6592
RF2	36.7047	31.3852	N/A	22.6159	25.0686
RF3	42.3908	29.3289	N/A	3.8078	7.8110
RF4	13.3139	49.8636	N/A	5.4927	8.3753
Thermal Capacitance (Joules/ $^{\circ}\text{C}$ )					
Junction to	Ambient Ch1	Ambient Ch2	Case	Foot Ch1	Foot Ch2
CF1	2.8328 m	235.8178 u	N/A	415.4909 u	322.9454 u
CF2	23.9144 m	6.7497 m	N/A	2.4696 m	2.4730 m
CF3	1.0823	64.2917 m	N/A	30.1241 m	28.3107 m
CF4	3.9200	1.4656	N/A	29.5966 m	117.1709 m

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

