



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 PSpice, 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 PSpice 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 PSpice Platform".

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION				
THERMAL RESISTANCE (°C/W)				
Junction to	Channel 1 Ambient	Channel 2 Ambient	Channel 1 Case	Channel 2 Case
RT1	5.0048	4.6396	1.4206	452.6567m
RT2	55.9051	56.5615	1.2843	1.1751
RT3	10.2358	10.5173	1.7542	1.2857
RT4	13.8543	13.2816	1.0409	186.5433m
THERMAL CAPACITANCE (Joules/°C)				
Junction to	Channel 1 Ambient	Channel 2 Ambient	Channel 1 Case	Channel 2 Case
CT1	901.0615u	4.3188m	1.5400m	1.3948m
CT2	1.3409	1.3298	955.7241u	10.9718m
CT3	16.2586m	24.6271m	7.8914m	7.4238m
CT4	197.3087m	230.2982m	246.3880m	176.5300m

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	Channel 1 Ambient	Channel 2 Ambient	Channel 1 Case	Channel 2 Case
RF1	4.4011	5.1241	2.8266	841.5745m
RF2	11.2017	12.6725	1.7462	1.3458
RF3	16.1288	16.4254	268.5796m	672.6393m
RF4	53.2684	50.7780	658.6204m	239.9862m
THERMAL CAPACITANCE (Joules/°C)				
Junction to	Channel 1 Ambient	Channel 2 Ambient	Channel 1 Case	Channel 2 Case
CF1	651.4856u	3.0408m	497.8301u	1.1773m
CF2	10.4287m	16.0878m	6.4111m	3.4762m
CF3	135.2992m	226.7788m	263.5433m	1.4122m
CF4	1.2187	1.2164	50.7400m	56.6706m

Note

- n/a indicates not applicable



