

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	Ambient	Case DrainTop	Case Source
RT1	12.7542	305.6245m	544.5543m
RT2	9.9672	330.3859m	383.9691m
RT3	2.0772	105.3532m	180.7976m
RT4	29.2014	258.6364m	290.6790m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case DrainTop	Case Source
CT1	1.1028	39.2406m	63.3285m
CT2	88.1971m	22.3953m	21.0606m
CT3	23.1883m	3.3612m	531.5482u
CT4	3.2687	15.3220m	10.0705m

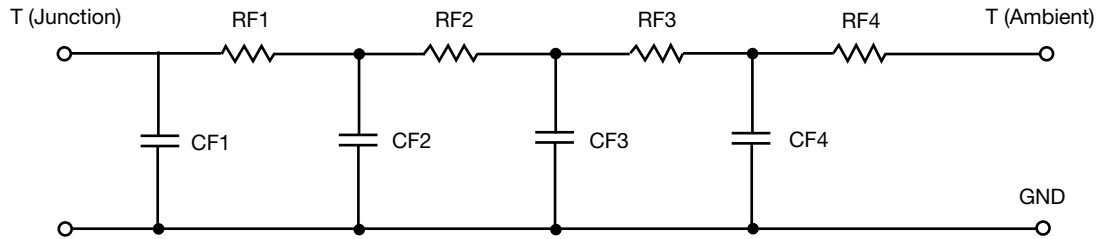
Note

- 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	Ambient	Case DrainTop	Case Source
RF1	4.3782	265.9231m	211.1036m
RF2	10.4502	152.6981m	699.9136m
RF3	22.2027	413.8846m	107.6259m
RF4	16.9689	167.4942m	381.3569m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	Ambient	Case DrainTop	Case Source
CF1	22.9756m	2.9640m	403.5571u
CF2	73.7270m	1.1090m	5.9697m
CF3	954.8578m	10.2340m	54.8570m
CF4	4.6553	196.2828u	338.8126u

Note

- n/a indicates not applicable

