



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	Nch Ambient	Pch Ambient	Nch Case	Pch Case
RT1	1.5163	1.5163	412.9000m	412.9000m
RT2	9.2792	9.2792	981.3000m	981.3000m
RT3	13.6619	13.6619	1.4877	1.4877
RT4	60.5426	60.5426	1.4181	1.4181
THERMAL CAPACITANCE (Joules/°C)				
Junction to	Nch Ambient	Pch Ambient	Nch Case	Pch Case
CT1	146.9790u	146.9790u	10.0888	10.0888
CT2	10.9460m	10.9460m	48.0417m	48.0417m
CT3	117.9312m	117.9312m	783.9540u	783.9540u
CT4	1.0033	1.0033	4.1737m	4.1737m

- 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	N-ch Ambient	P-ch Ambient	N-ch Case	P-ch Case
RF1	1.8428	1.8428	2.0419	2.0419
RF2	12.6955	12.6955	1.0618	1.0618
RF3	15.121	15.1210	759.5000m	759.5000m
RF4	55.3407	55.3407	436.8000m	436.8000m
THERMAL CAPACITANCE (Joules/°C)				
Junction to	N-ch Ambient	P-ch Ambient	N-ch Case	P-ch Case
CF1	401.4701u	401.4701u	657.3594u	657.3594u
CF2	11.2857m	11.2857m	4.6246m	4.6246m
CF3	150.3625m	150.3625m	44.2907m	44.2907m
CF4	951.2119m	951.2119m	8.9167	8.9167

Note

- n/a indicates not applicable



