

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		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
RT1	4.4941	4.2948	1.1399	1.2098	n/a
RT2	13.8724	12.6741	2.0391	524.7156m	n/a
RT3	9.8007	10.9521	1.0650	177.4844m	n/a
RT4	56.8328	57.0790	1.2560	1.1880	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CT1	828.9282u	3.8699m	1.0532m	9.0726m	n/a
CT2	164.9655m	226.2727m	5.4945m	1.4775m	n/a
CT3	14.3520m	23.2460m	220.7686m	111.4105m	n/a
CT4	1.2906	1.3115	1.2660m	10.9142m	n/a

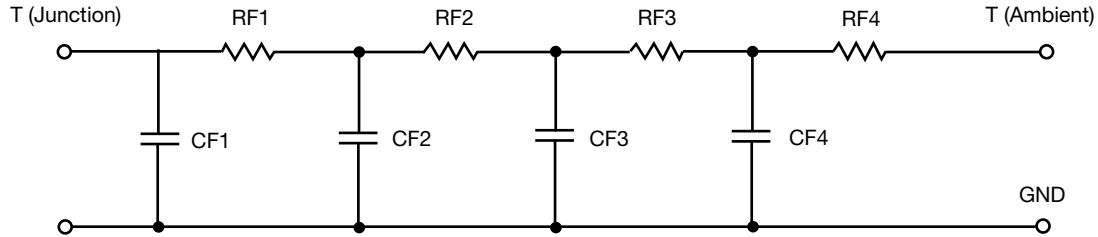
Note

- 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		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
RF1	5.5596	5.1630	1.5446	888.6521m	n/a
RF2	12.9699	12.8823	1.9558	1.1494	n/a
RF3	16.4093	16.5533	1.1773	981.8705m	n/a
RF4	50.0612	50.4014	822.3000m	80.0774m	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CF1	862.2997u	2.5267m	423.6227u	1.1864m	n/a
CF2	16.4075m	18.0960m	751.2718u	3.7026m	n/a
CF3	226.4595m	225.6561m	14.1083m	1.9284m	n/a
CF4	1.2614	1.2536	310.9968m	89.0238m	n/a

Note

- n/a indicates not applicable

