



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		Foot		Case	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
RT1	10.0698	10.3402	n/a	n/a	675.5900m	654.4032m
RT2	9.7529	9.4124	n/a	n/a	1.9216	2.2060
RT3	3.7672	3.4446	n/a	n/a	399.8504m	348.6939m
RT4	46.1047	46.5711	n/a	n/a	301.2457m	293.0798m
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Foot		Case	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CT1	331.9624m	887.9575m	n/a	n/a	2.3746m	2.6959m
CT2	40.8915m	75.6054m	n/a	n/a	4.4360m	6.6610m
CT3	1.9684m	13.5310m	n/a	n/a	38.2777m	62.3075m
CT4	1.3863	1.5337	n/a	n/a	685.1279u	1.4817m

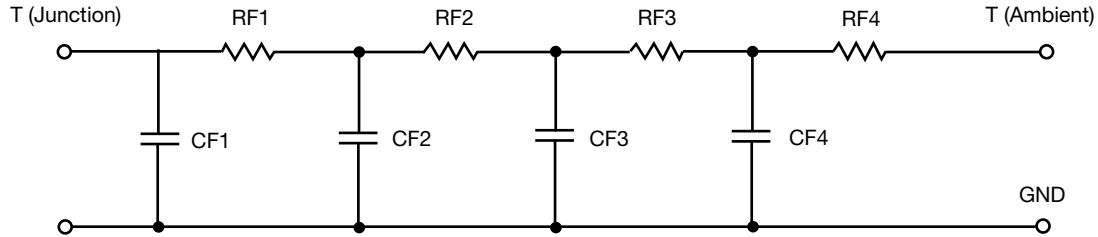
Note

- 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		Foot		Case	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
RF1	4.1628	3.4514	n/a	n/a	625.2185m	594.5806m
RF2	12.0441	10.9621	n/a	n/a	1.5550	1.6825
RF3	15.3300	17.3312	n/a	n/a	48.4156m	18.7430m
RF4	38.4698	38.4093	n/a	n/a	1.0697	1.2177
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Foot		Case	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CF1	1.7987m	10.6841m	n/a	n/a	449.0485u	690.4659u
CF2	32.4543m	41.6289m	n/a	n/a	1.5418m	1.9059m
CF3	313.4293m	421.4905m	n/a	n/a	4.9577m	8.5343m
CF4	1.3941	1.3661	n/a	n/a	301.4448u	4.3920m

Note

- n/a indicates not applicable

