

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	5.6770	3.4480	1.0088	366.4683m	n/a
RT2	12.9058	10.6258	3.4856	2.2558	n/a
RT3	11.7193	8.2051	427.4000m	433.6121m	n/a
RT4	37.6979	34.7211	1.2782	44.1196m	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CT1	134.3922u	125.1201u	166.2525u	269.2363u	n/a
CT2	813.2019m	354.2872m	1.6830m	1.1204m	n/a
CT3	14.2833m	19.6788m	36.1397m	23.3736m	n/a
CT4	2.5870	1.6509	530.6375u	1.5570	n/a

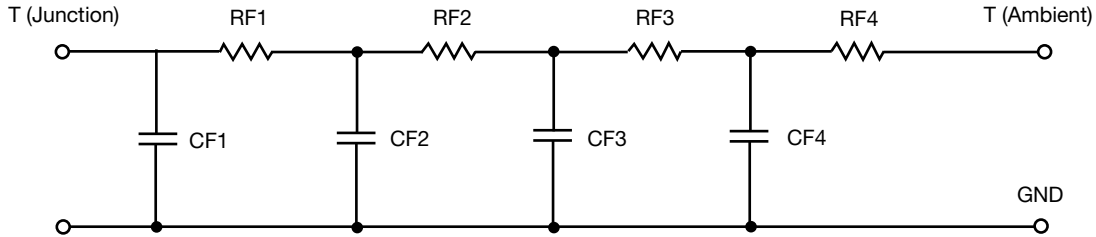
Note

- 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	5.3535	3.1890	1.6421	826.5197m	n/a
RF2	12.2571	8.5566	2.2543	1.7111	n/a
RF3	18.9298	13.9962	2.2327	443.9649m	n/a
RF4	31.4596	31.2582	70.9000m	118.4154m	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CF1	105.0275u	77.6321u	84.8834u	255.4541u	n/a
CF2	12.0511m	14.5031m	544.2183u	1.1604m	n/a
CF3	545.2023m	229.6427m	2.5281m	3.5057m	n/a
CF4	2.3550	1.5454	671.2830m	88.0494m	n/a

Note

- n/a indicates not applicable

