

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 P-SPICE, 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 P-SPICE 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 P-SPICE Platform".

R-C THERMAL MODEL FOR TANK CONFIGURATION

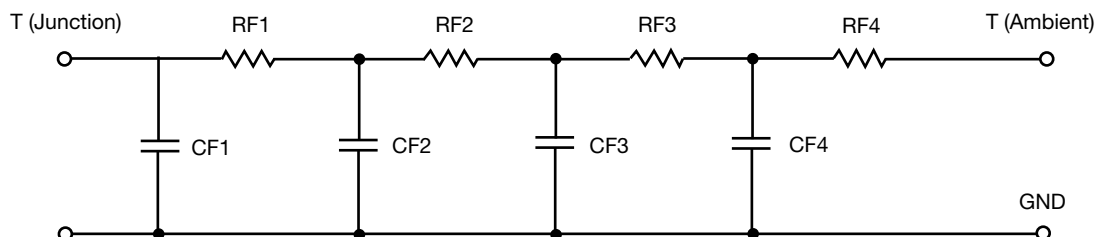


R-C VALUES FOR TANK CONFIGURATION						
THERMAL RESISTANCE (°C/W)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
RT1	6.8691	6.7907	N/A	N/A	18.3873	4.8313
RT2	29.7186	19.4342	N/A	N/A	3.1359	2.9036
RT3	22.2929	21.1301	N/A	N/A	18.1603	6.0181
RT4	51.1194	38.6768	N/A	N/A	2.0907	9.1648
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CT1	1.0405m	2.7657m	N/A	N/A	26.6220m	197.2030m
CT2	8.6095m	51.3747m	N/A	N/A	574.1209u	223.8315u
CT3	144.7631m	661.7378m	N/A	N/A	3.6695m	2.7394m
CT4	1.7365	2.7017	N/A	N/A	4.6774m	11.1623m

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	Channel 1	Channel 2
RF1	10.7884	7.5668	N/A	N/A	7.2872	4.2266
RF2	38.0661	24.5348	N/A	N/A	18.8569	10.4998
RF3	35.1731	35.5246	N/A	N/A	10.7420	5.9940
RF4	25.1523	18.8486	N/A	N/A	5.0357	2.2554
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CF1	990.2923u	2.5850m	N/A	N/A	570.3582u	253.2406u
CF2	11.0031m	48.3114m	N/A	N/A	2.7004m	2.8682m
CF3	598.4420m	753.4585m	N/A	N/A	17.0605m	30.0414m
CF4	4.1682	6.2106	N/A	N/A	109.8530m	632.7378m

Note

N/A indicates not applicable

