

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	
	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2
RT1	7.6613	23.7726	N/A	N/A	8.0571	15.4916
RT2	21.2365	8.3359	N/A	N/A	10.3501	11.3025
RT3	16.4338	25.4855	N/A	N/A	7.0414	9.7142
RT4	49.3630	52.3513	N/A	N/A	2.5872	3.3426
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2
CT1	2.4118m	4.7181m	N/A	N/A	165.5358m	87.8917m
CT2	31.8521m	510.3109u	N/A	N/A	52.0059m	29.4068m
CT3	189.1796m	33.6199m	N/A	N/A	8.4851m	8.6594m
CT4	1.3176	1.4249	N/A	N/A	557.2095u	2.0876m

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	
	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2
RF1	8.2656	14.6218	N/A	N/A	3.3161	14.5065
RF2	30.1659	33.7987	N/A	N/A	9.9524	8.9256
RF3	18.6400	14.8562	N/A	N/A	7.4069	5.2244
RF4	37.8043	46.3749	N/A	N/A	7.3076	11.0567
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2	N-CH/Channel 1	P-Ch/Channel 2
CF1	1.9509m	640.8370u	N/A	N/A	814.7390u	3.1392m
CF2	24.8364m	6.1887m	N/A	N/A	6.4893m	11.2982m
CF3	370.1664m	175.8183m	N/A	N/A	47.9069m	34.4004m
CF4	1.3954	1.5019	N/A	N/A	16.4955m	13.2910m

Note

N/A indicates not applicable



