

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

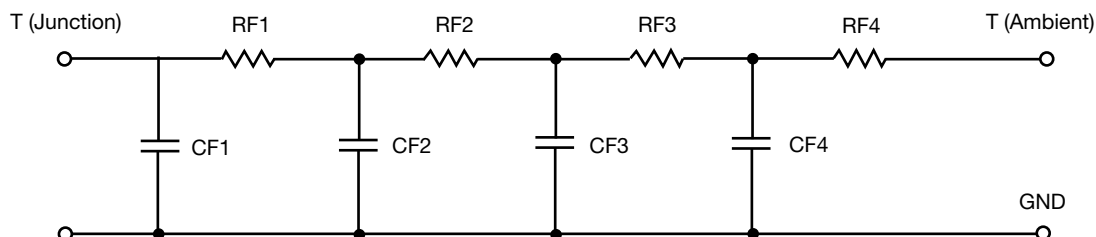


R-C VALUES FOR TANK CONFIGURATION						
THERMAL RESISTANCE (°C/W)						
Junction to	Ambient		Case		Foot	
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2
RT1	13.8615	12.9393	N/A	N/A	11.4493	23.4402
RT2	46.1252	43.4881	N/A	N/A	27.4200	10.9620
RT3	39.6459	47.8599	N/A	N/A	26.0457	19.4430
RT4	50.3664	49.4521	N/A	N/A	24.9593	41.1548
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2
CT1	176.2092u	289.6611u	N/A	N/A	72.5167u	1.5649m
CT2	1.2914m	1.4921m	N/A	N/A	3.6944m	214.4767u
CT3	12.8500m	10.5436m	N/A	N/A	700.8137u	58.1757m
CT4	1.4505	1.5052	N/A	N/A	1.3702m	2.9908m

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	
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2
RF1	13.0019	17.0836	N/A	N/A	15.1544	17.5427
RF2	53.4507	47.3090	N/A	N/A	32.2783	43.3715
RF3	33.9623	41.2460	N/A	N/A	29.2519	24.0470
RF4	49.5851	49.3614	N/A	N/A	13.3027	10.0388
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2
CF1	102.3062u	229.5127u	N/A	N/A	63.9325u	188.2622u
CF2	880.9529u	1.0029m	N/A	N/A	315.2523u	968.0053u
CF3	13.6265m	9.9194m	N/A	N/A	373.9146u	5.7792m
CF4	1.4448	1.6273	N/A	N/A	7.1475m	160.3470m

Note

N/A indicates not applicable

