

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

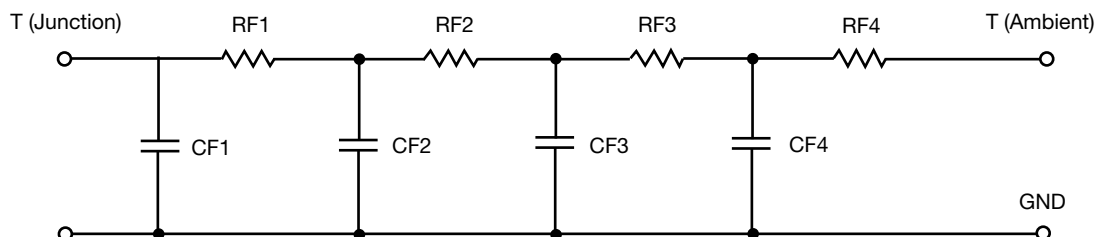


R-C VALUES FOR TANK CONFIGURATION						
THERMAL RESISTANCE (°C/W)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
RT1	2.2116	1.7617	491.3236m	114.3448m	N/A	N/A
RT2	13.6348	11.9747	994.0403m	946.9164m	N/A	N/A
RT3	12.0147	11.7736	717.7417m	1.0304	N/A	N/A
RT4	39.1389	39.4900	2.3717	501.1014m	N/A	N/A
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CT1	528.5864u	1.7285m	170.8814u	39.9912u	N/A	N/A
CT2	8.3992m	20.6029m	1.2721m	5.8771m	N/A	N/A
CT3	228.6182m	519.3184m	32.5177m	16.2515m	N/A	N/A
CT4	1.8749	1.9800	2.4784m	381.8702u	N/A	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	Channel 1	Channel 2
RF1	7.3405	6.0660	1.1654	500.2237m	N/A	N/A
RF2	14.1143	11.7244	1.7223	1.2269	N/A	N/A
RF3	21.4927	23.7067	1.6747	858.5529m	N/A	N/A
RF4	23.3041	22.8162	9.8232m	1.9575m	N/A	N/A
THERMAL CAPACITANCE (Joules/°C)						
Junction to	Ambient		Case		Foot	
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CF1	1.7843m	4.6630m	214.3103u	128.4111u	N/A	N/A
CF2	21.3888m	43.6239m	1.0472m	2.6961m	N/A	N/A
CF3	628.2305m	666.7115m	3.8790m	12.0709m	N/A	N/A
CF4	2.9499	2.9587	328.3534u	33.2303u	N/A	N/A

Note

N/A indicates not applicable

