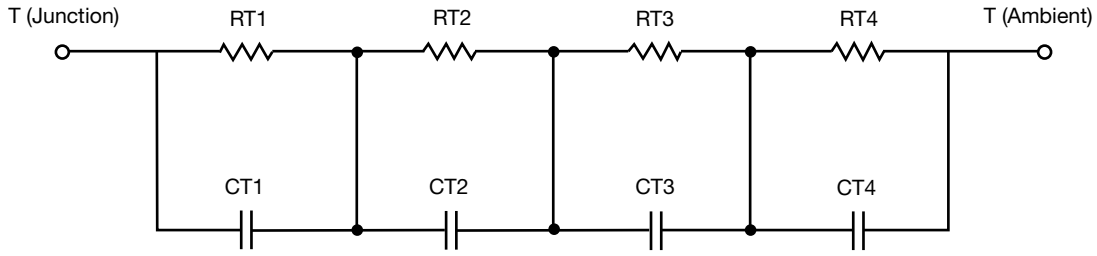
R-C Thermal Model Parameters

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



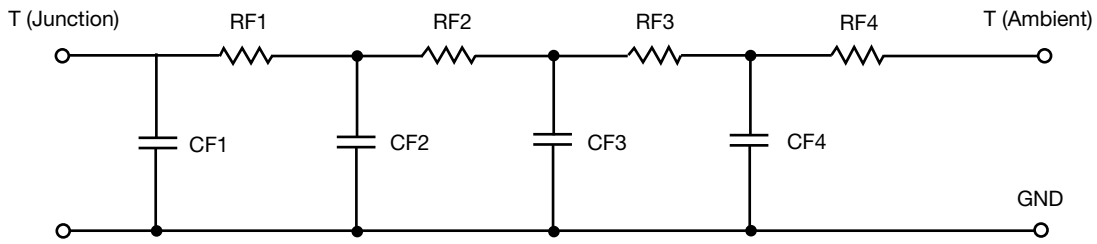
R-C VALUES FOR TANK CONFIGURATION					
THERMAL RESISTANCE (°C/W)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
RT1	7.5001	3.6707	2.6042	1.0860	n/a
RT2	13.1238	29.4201	812.4787m	353.3779m	n/a
RT3	14.2404	10.3123	248.0299m	286.2782m	n/a
RT4	32.2818	12.8111	2.6386	174.3439m	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CT1	541.9442u	2.3679m	891.4420u	1.3914m	n/a
CT2	861.8346m	3.3642	195.3999u	15.2580m	n/a
CT3	18.7690m	44.3919m	1.0292	103.2616u	n/a
CT4	2.8612	1.1029	3.9101m	37.4179m	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	7.8586	6.0582	1.2788	370.9797m	n/a
RF2	14.5121	10.2174	2.9391	1.3728	n/a
RF3	20.5874	22.4690	1.5721	117.4847m	n/a
RF4	25.0419	17.6048	403.3005m	38.7356m	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Case		Foot
	Channel 1	Channel 2	Channel 1	Channel 2	
CF1	521.8606u	4.2245m	178.7722u	126.0606u	n/a
CF2	17.2311m	66.1436m	545.3847u	1.3124m	n/a
CF3	648.0695m	949.0795m	3.6965m	28.1639m	n/a
CF4	3.0102	4.8090	33.2004m	364.0417m	n/a

Note

- n/a indicates not applicable