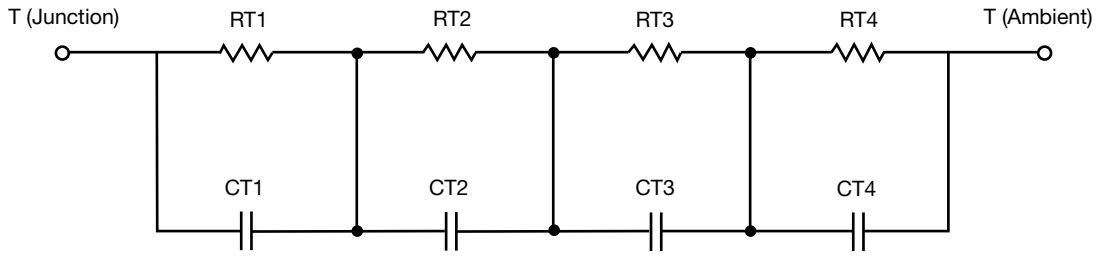
R-C Thermal Model Parameters

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 PSpice, 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 PSpice 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 PSpice Platform”.

R-C THERMAL MODEL FOR TANK CONFIGURATION



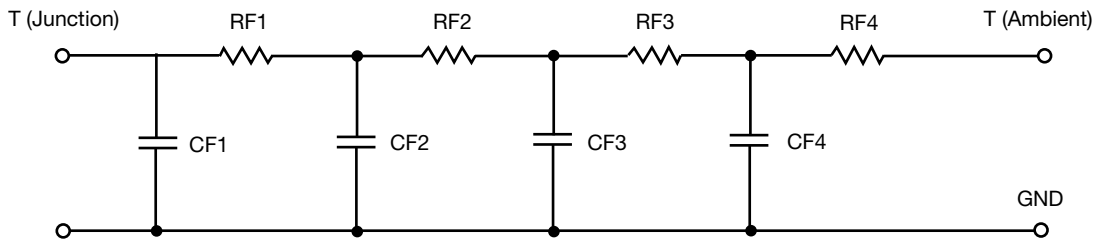
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.0433	n/a	11.4467
RT2	17.5890	n/a	12.0578
RT3	32.4865	n/a	11.7105
RT4	56.8812	n/a	2.7850
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	7.2000m	n/a	7.2444m
CT2	3.0226m	n/a	5.6477m
CT3	23.1454m	n/a	98.4640m
CT4	1.0243	n/a	262.1619u

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**
RF1	25.5340	n/a	4.0904
RF2	27.8529	n/a	24.2066
RF3	17.8367	n/a	1.6022
RF4	38.7764	n/a	8.1008
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.3397m	n/a	389.3073u
CF2	21.5087m	n/a	3.0130m
CF3	641.4909m	n/a	42.2801m
CF4	830.8550m	n/a	131.0694m

Note

- n/a indicates not applicable