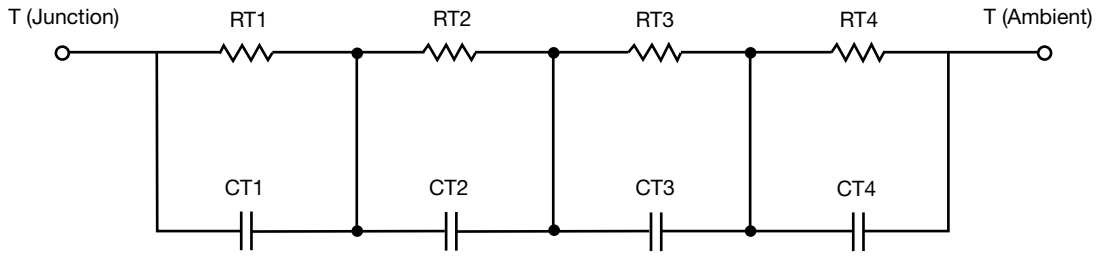
R-C Thermal Model Parameters

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



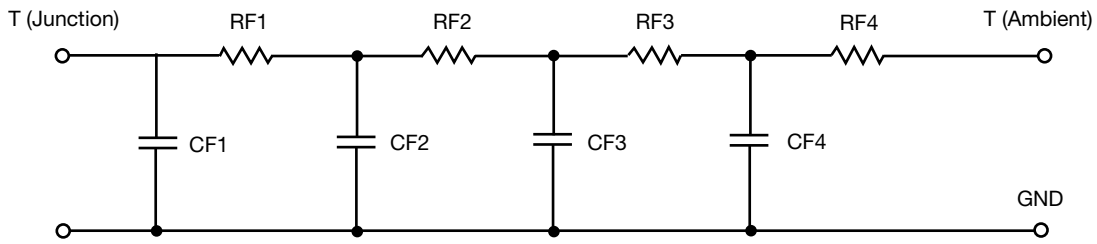
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	56.4442	n/a	15.7816
RT2	5.9534	n/a	3.1065
RT3	34.1503	n/a	1.7819
RT4	13.1361	n/a	9.3571
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3255	n/a	3.4545m
CT2	369.0254m	n/a	495.7684u
CT3	10.6429m	n/a	129.3625m
CT4	1.7229m	n/a	25.0124m

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	12.4897	n/a	3.6800
RF2	32.8378	n/a	14.0650
RF3	11.2533	n/a	7.6191
RF4	53.2882	n/a	4.6414
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.1061m	n/a	403.9149u
CF2	6.4977m	n/a	2.3269m
CF3	153.5726m	n/a	2.9017m
CF4	1.2770	n/a	42.4980m

Note

- n/a indicates not applicable