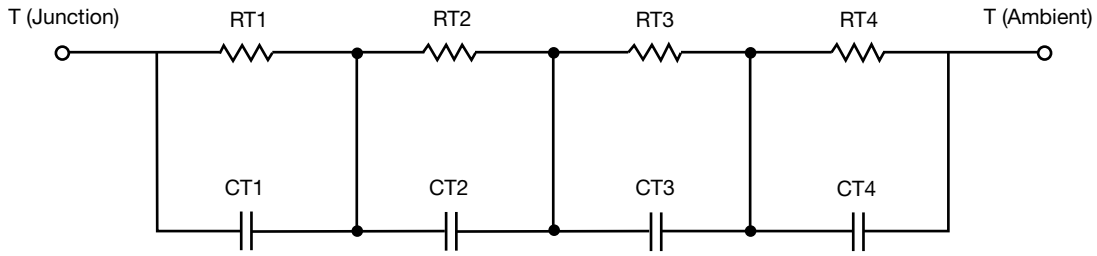
R-C Thermal Model Parameters

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



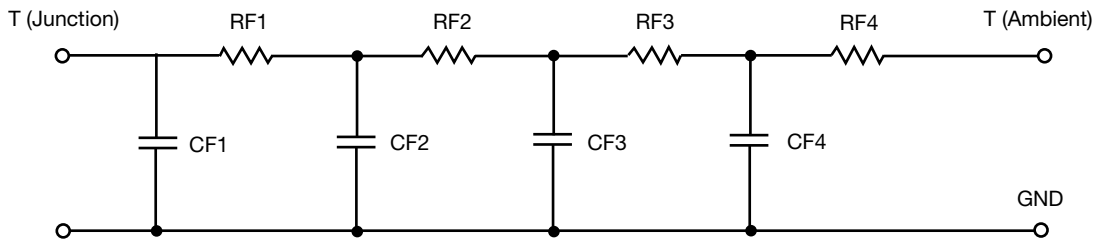
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.7093	n/a	12.5651
RT2	38.9649	n/a	3.6412
RT3	74.1761	n/a	28.1417
RT4	40.1497	n/a	33.6520
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	914.6057u	n/a	2.3388m
CT2	6.3002m	n/a	118.3023u
CT3	18.5836m	n/a	8.5166m
CT4	1.3989	n/a	24.8386m

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	13.0369	n/a	3.4209
RF2	45.7533	n/a	16.7866
RF3	77.5694	n/a	43.1277
RF4	38.6404	n/a	14.6648
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	432.6249u	n/a	88.1936u
CF2	1.7423m	n/a	1.2590m
CF3	12.0840m	n/a	4.8276m
CF4	1.4185	n/a	62.4462m

Note

- n/a indicates not applicable