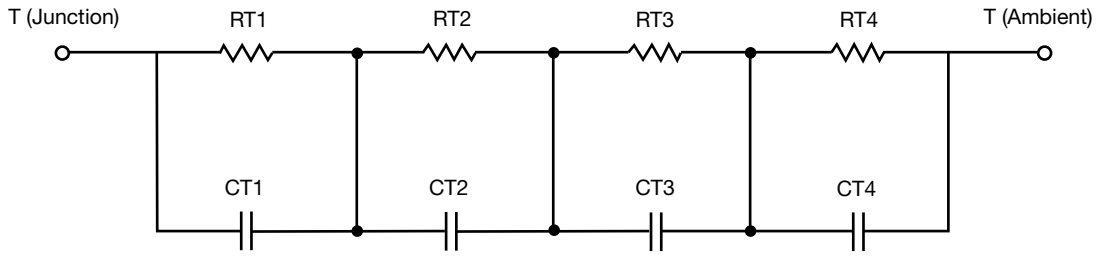
R-C Thermal Model Parameters

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



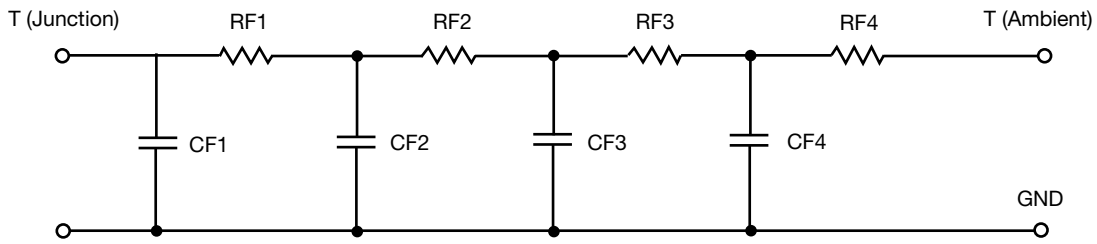
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.3526	362.3679u	n/a
RT2	7.8613	504.3467m	n/a
RT3	12.0154	972.1139m	n/a
RT4	56.7707	923.1770m	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.5696m	1.9260m	n/a
CT2	31.5646m	787.5516u	n/a
CT3	118.2264m	18.2079m	n/a
CT4	1.2151	9.3126m	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**
RF1	7.4586	6.0391m	n/a
RF2	9.9846	670.9463m	n/a
RF3	10.8213	1.0320	n/a
RF4	52.7355	691.0146m	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.8233m	125.4667u	n/a
CF2	23.7571m	695.7232u	n/a
CF3	158.3257m	6.0783m	n/a
CF4	1.1324	527.9622u	n/a

Note

- n/a indicates not applicable