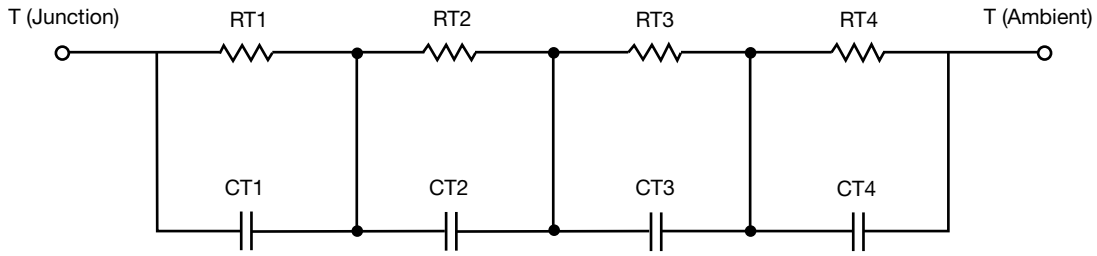
R-C Thermal Model Parameters

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



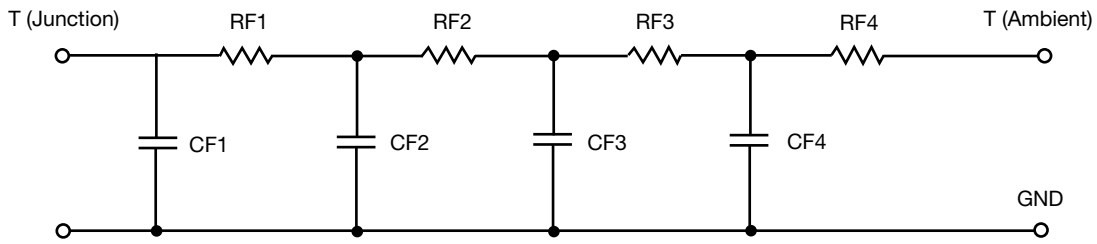
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	5.8682	1.2066	n/a
RT2	16.4116	1.5253	n/a
RT3	11.4715	2.4315	n/a
RT4	46.2487	1.3422	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	490.5172u	175.7850u	n/a
CT2	6.8276m	1.0403m	n/a
CT3	151.7582m	1.5821m	n/a
CT4	1.6675	2.3302m	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	6.7252	1.8012	n/a
RF2	15.7322	2.7556	n/a
RF3	11.6591	690.8903m	n/a
RF4	45.8835	1.2354	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	475.5980u	116.3474u	n/a
CF2	5.7640m	335.5167u	n/a
CF3	91.2488m	586.5703u	n/a
CF4	1.5026	754.3171u	n/a

Note

- n/a indicates not applicable