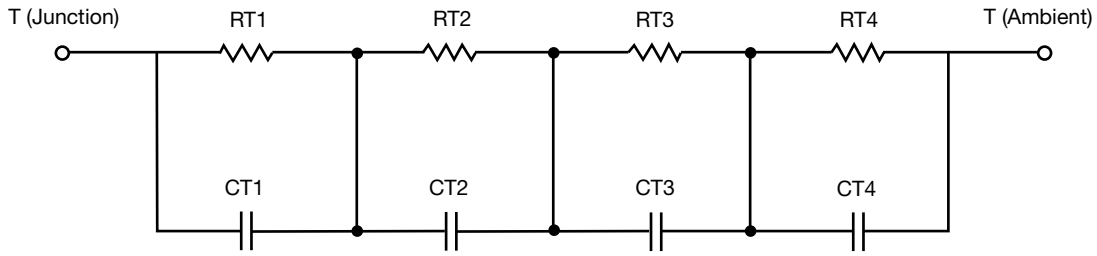
R-C Thermal Model Parameters

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



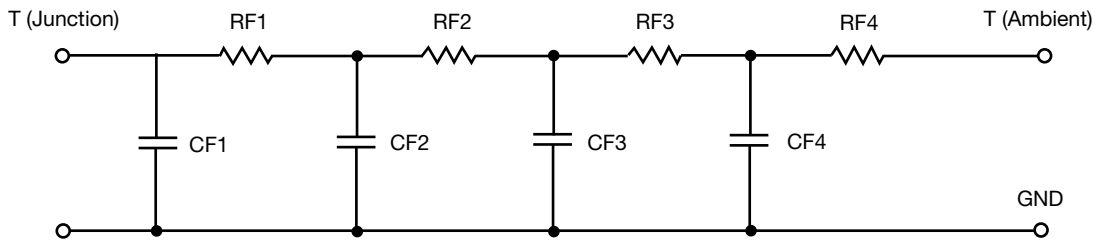
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	24.6189	n/a	6.4980
RT2	2.5490	n/a	4.9456
RT3	16.5954	n/a	8.5611
RT4	40.3311	n/a	1.9315
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	115.1326m	n/a	387.4875m
CT2	69.1165u	n/a	9.3361m
CT3	9.8531m	n/a	33.4644m
CT4	1.7745	n/a	496.8852u

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	2.5120	n/a	2.4856
RF2	19.9530	n/a	10.5063
RF3	24.3986	n/a	6.7924
RF4	37.1775	n/a	2.0213
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	60.1652u	n/a	601.3091u
CF2	9.0625m	n/a	8.6923m
CF3	108.7787m	n/a	126.1028m
CF4	1.7897	n/a	717.3494m

Note

- n/a indicates not applicable