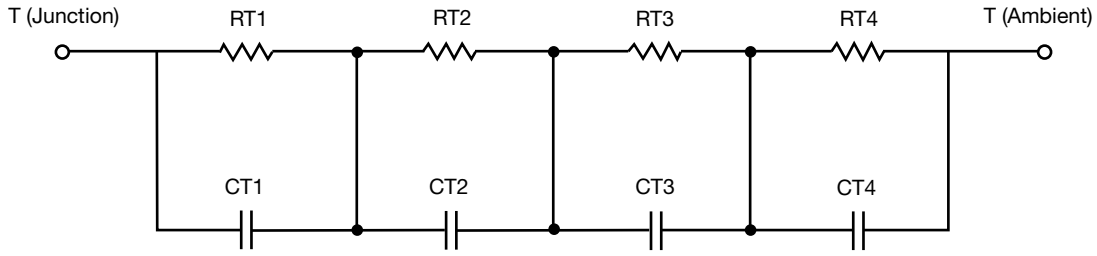
R-C Thermal Model Parameters

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



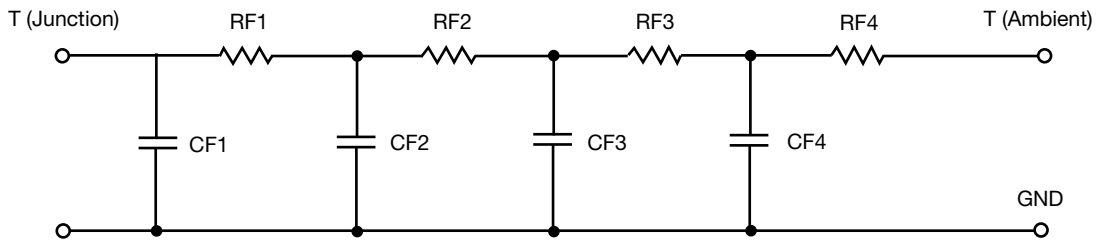
R-C VALUES FOR TANK CONFIGURATION					
THERMAL RESISTANCE (°C/W)					
Junction to	Ambient		Foot		Case
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	
RT1	8.7824	9.4234	11.7480	11.7480	n/a
RT2	28.3936	28.1457	16.9770	16.9767	n/a
RT3	23.2185	35.2396	5.4028	5.4029	n/a
RT4	48.4884	31.6121	10.7746	10.7750	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Foot		Case
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	
CT1	489.3804u	1.6098m	3.4909m	3.4901m	n/a
CT2	8.6678m	16.5025m	15.3618m	15.3958m	n/a
CT3	125.3519m	122.3507m	213.1447u	213.1316u	n/a
CT4	1.6270	2.7821	154.6826m	154.5902m	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		Foot		Case
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	
RF1	11.3114	8.0498	6.8076	6.8076	n/a
RF2	29.2913	29.6528	21.0081	21.0078	n/a
RF3	23.7083	36.8146	8.5137	8.5138	n/a
RF4	44.5261	29.7964	8.2910	8.2908	n/a
THERMAL CAPACITANCE (Joules/°C)					
Junction to	Ambient		Foot		Case
	NCh-Channel 1	PCh-Channel 2	NCh-Channel 1	PCh-Channel 2	
CF1	571.9884u	1.0559m	220.6605u	220.6578u	n/a
CF2	8.3572m	8.8707m	3.2563m	3.2563m	n/a
CF3	110.7112m	81.8064m	44.9759m	44.9757m	n/a
CF4	1.6665	2.7262	12.9723u	12.9721u	n/a

Note

- n/a indicates not applicable