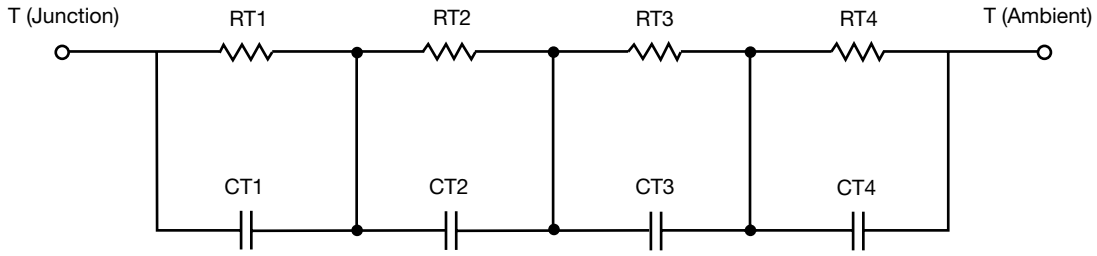
R-C Thermal Model Parameters

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 P-SPICE, 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 P-SPICE 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 P-SPICE Platform”.

R-C THERMAL MODEL FOR TANK CONFIGURATION



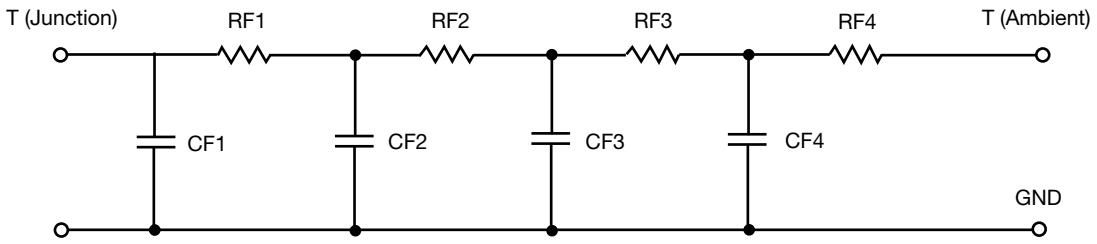
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	1.0479	N/A
RT2	N/A	2.0434	N/A
RT3	N/A	2.0702	N/A
RT4	N/A	338.5000 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	5.1735 m	N/A
CT2	N/A	115.9934 m	N/A
CT3	N/A	22.6820 m	N/A
CT4	N/A	810.6376 u	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.

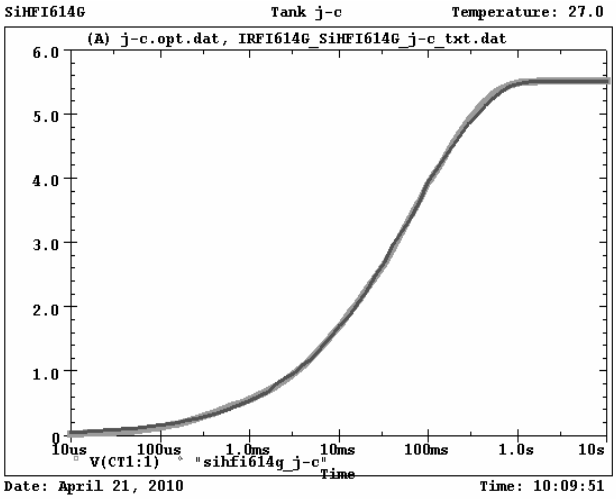
R-C THERMAL MODEL FOR FILTER CONFIGURATION

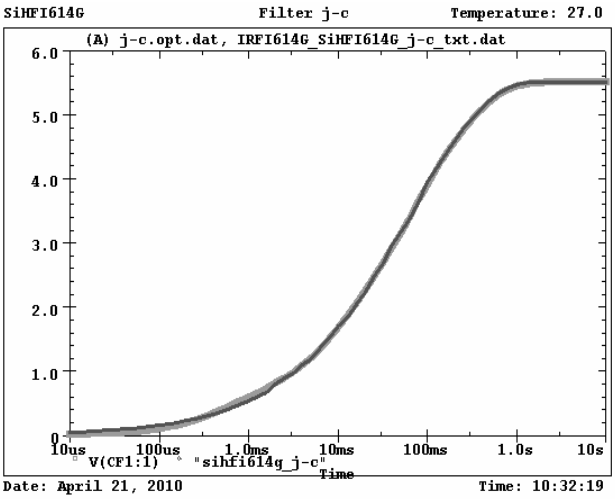


R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	674.1000 m	N/A
RF2	N/A	1.6670	N/A
RF3	N/A	2.1124	N/A
RF4	N/A	1.0465	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	851.0934 u	N/A
CF2	N/A	5.0777 m	N/A
CF3	N/A	22.8292 m	N/A
CF4	N/A	226.3413 m	N/A

Note

- N/A indicates not applicable


SiHFI614G
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, IRFI614G_SiHFI614G_j-c_txt.dat
6.0
5.0
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)
"sihfi614g_j-c"
Time
Date: April 21, 2010
Time: 10:09:51


SiHFI614G
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, IRFI614G_SiHFI614G_j-c_txt.dat
6.0
5.0
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"sihfi614g_j-c"
Time
Date: April 21, 2010
Time: 10:32:19