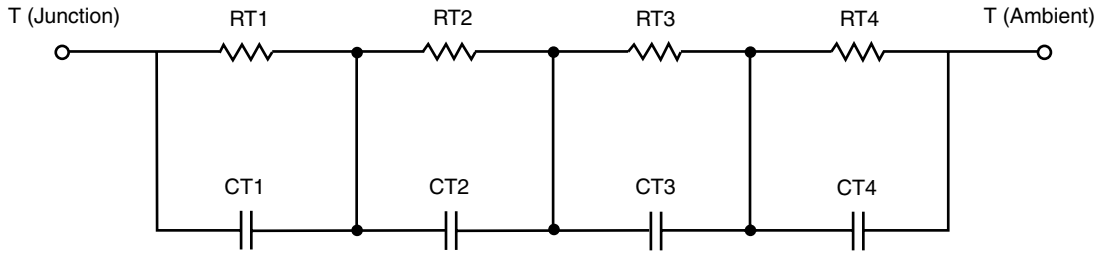
R-C Thermal Model Parameters

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

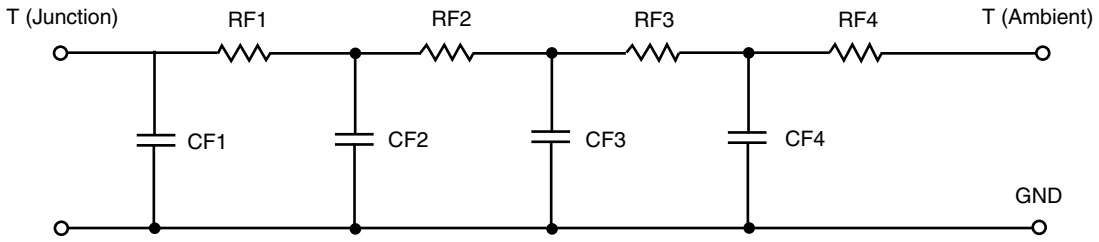


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.4756	N/A	1.2579
RT2	7.8488	N/A	9.2411
RT3	14.1073	N/A	5.5158
RT4	51.5683	N/A	3.9852
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	46.2564 m	N/A	1.1507
CT2	709.7718 u	N/A	2.8689 m
CT3	5.7043 m	N/A	15.6254 m
CT4	1.3533	N/A	849.6270 u

Note
N/A indicates not applicable

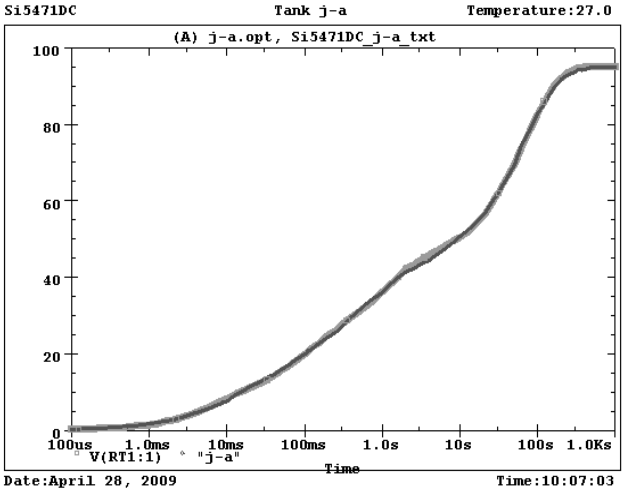
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

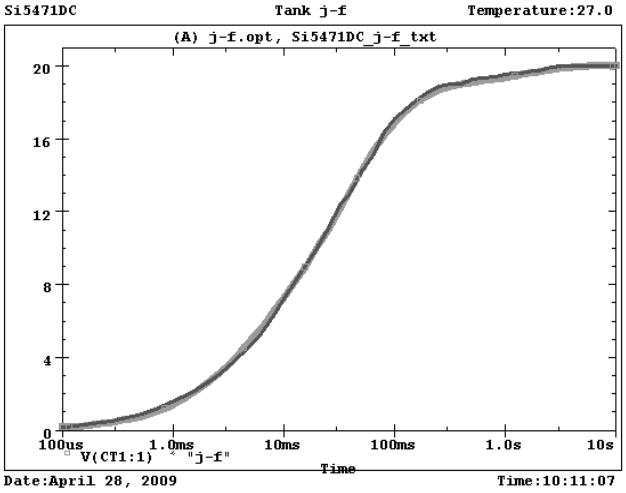
R-C THERMAL MODEL FOR FILTER CONFIGURATION

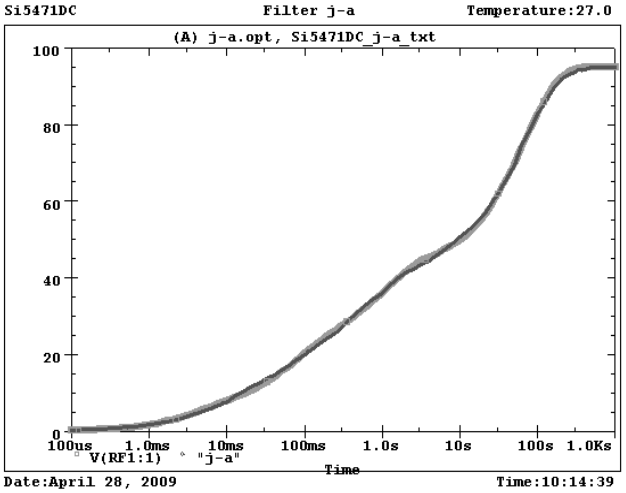


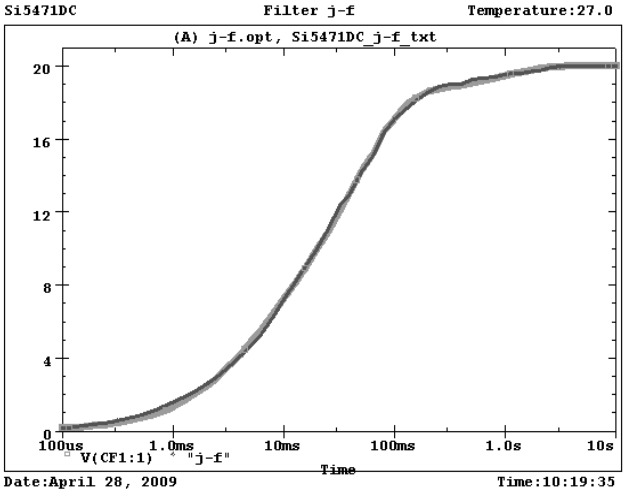
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.1649	N/A	7.8979
RF2	16.9203	N/A	10.5963
RF3	19.2364	N/A	860.1971 m
RF4	50.6784	N/A	645.6029 m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	527.6603 u	N/A	683.5960 u
CF2	3.7697 m	N/A	3.2860 m
CF3	45.3320 m	N/A	536.1706 m
CF4	1.2878	N/A	6.1769 m

Note
N/A indicates not applicable


Si5471DC
Tank j-a
Temperature:27.0
(A) j-a.opt, Si5471DC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:April 28, 2009
Time:10:07:03


Si5471DC
Tank j-f
Temperature:27.0
(A) j-f.opt, Si5471DC_j-f_txt
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)
"j-f"
Time
Date:April 28, 2009
Time:10:11:07


Si5471DC
Filter j-a
Temperature:27.0
(A) j-a.opt, Si5471DC_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:April 28, 2009
Time:10:14:39


Si5471DC
Filter j-f
Temperature:27.0
(A) j-f.opt, Si5471DC_j-f_txt
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:April 28, 2009
Time:10:19:35