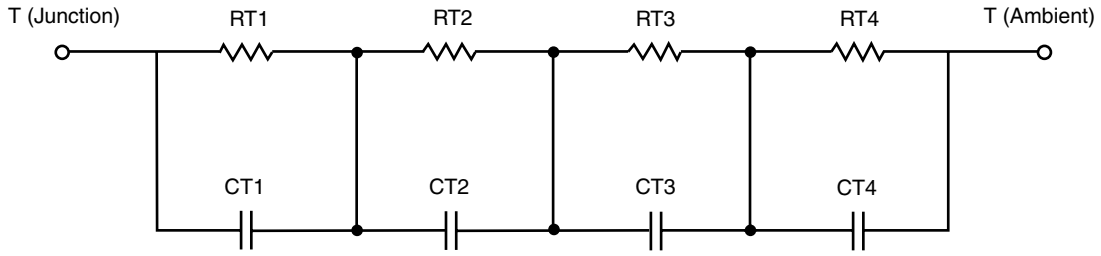
R-C Thermal Model Parameters

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

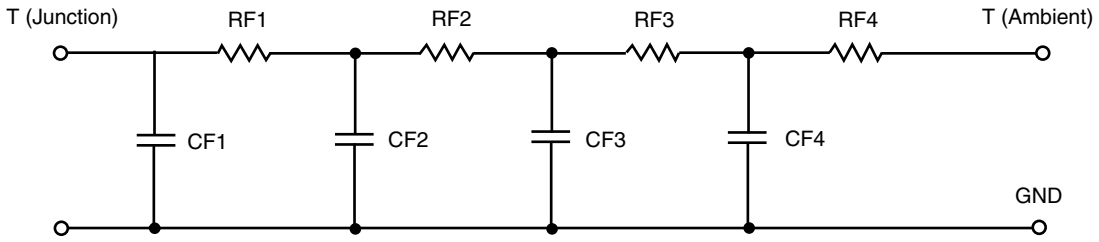


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	17.8284	960.6469 m	N/A
RT2	30.9354	847.5531 m	N/A
RT3	8.9741	1.5363	N/A
RT4	23.3757	1.1555	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	45.8313 m	19.2427 m	N/A
CT2	2.8348	457.2441 u	N/A
CT3	5.5092 m	9.5660 m	N/A
CT4	1.4299	5.4578 m	N/A

Note
N/A indicates not applicable

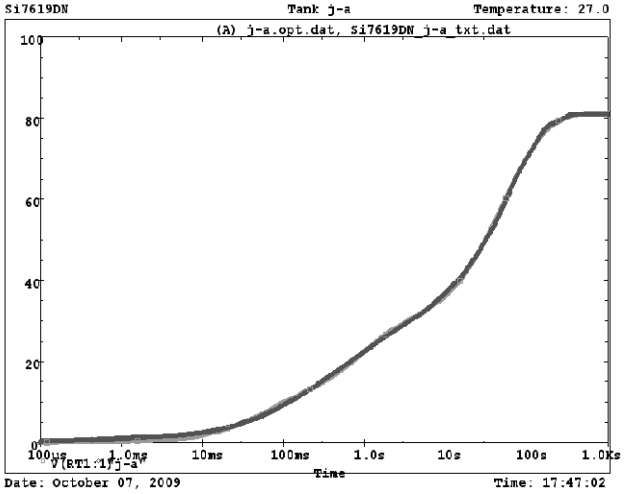
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

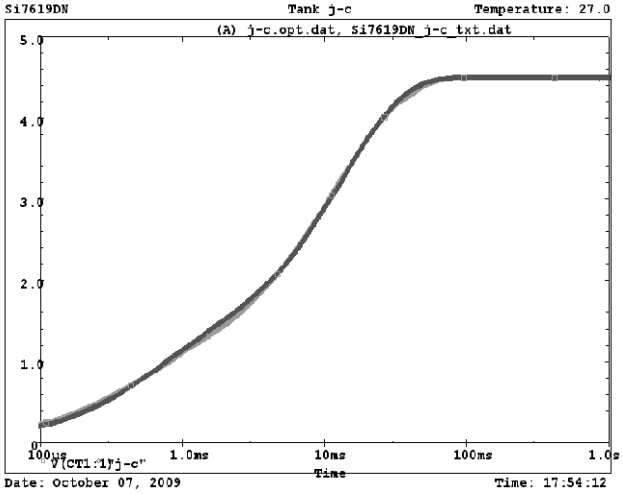
R-C THERMAL MODEL FOR FILTER CONFIGURATION

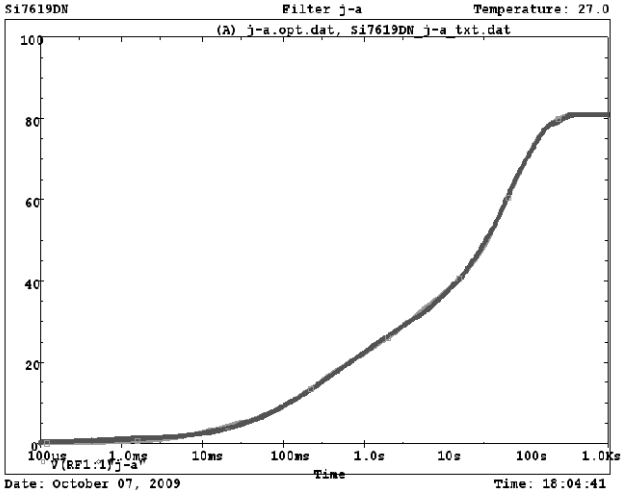


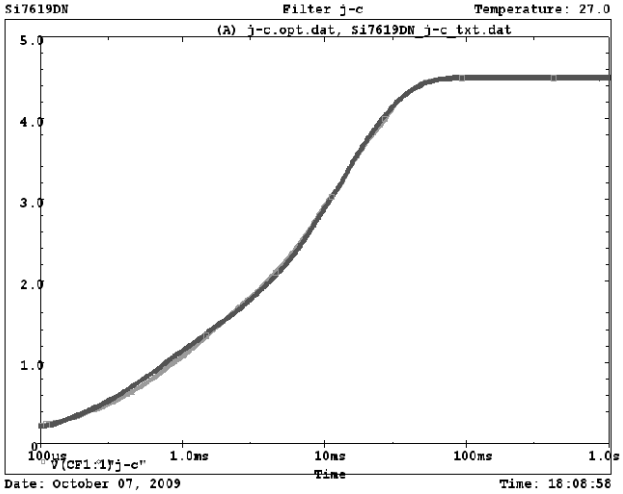
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.6613	416.5000 m	N/A
RF2	14.6117	1.1870	N/A
RF3	14.6854	1.6845	N/A
RF4	47.0416	1.2120	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.4888 m	354.4541 u	N/A
CF2	11.7823 m	401.9611 u	N/A
CF3	147.7955 m	3.7349 m	N/A
CF4	1.2150	268.1846 u	N/A

Note
N/A indicates not applicable


Si7619DN
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, Si7619DN_j-a_txt.dat
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a"
Time
Date: October 07, 2009
Time: 17:47:02


Si7619DN
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, Si7619DN_j-c_txt.dat
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: October 07, 2009
Time: 17:54:12


Si7619DN
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, Si7619DN_j-a_txt.dat
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: October 07, 2009
Time: 18:04:41


Si7619DN
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, Si7619DN_j-c_txt.dat
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: October 07, 2009
Time: 18:08:58