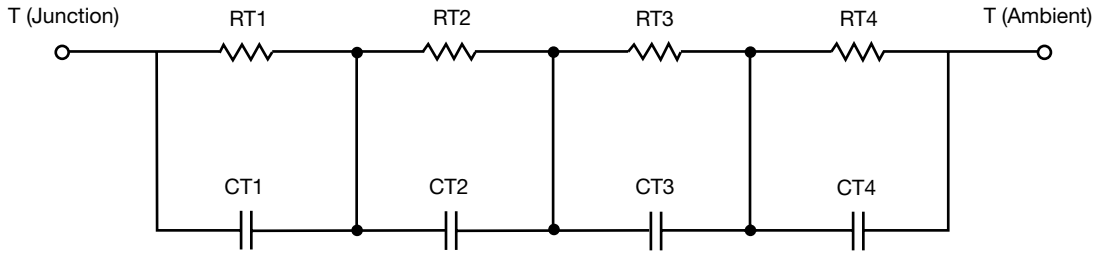
R-C Thermal Model Parameters

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

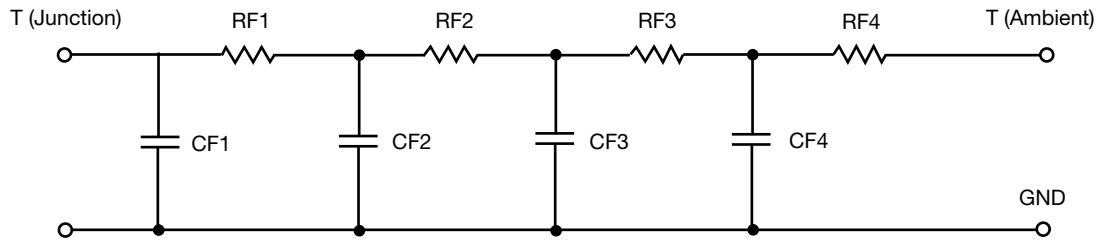


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.5550	773.9000 m	N/A
RT2	8.3674	51.1000 m	N/A
RT3	5.6842	943.6000 m	N/A
RT4	48.3934	31.4000 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	17.7858 m	7.5646 m	N/A
CT2	313.9576 m	25.0446 u	N/A
CT3	123.7878 m	20.4202 m	N/A
CT4	1.3465	109.4170 u	N/A

Note
N/A indicates not applicable

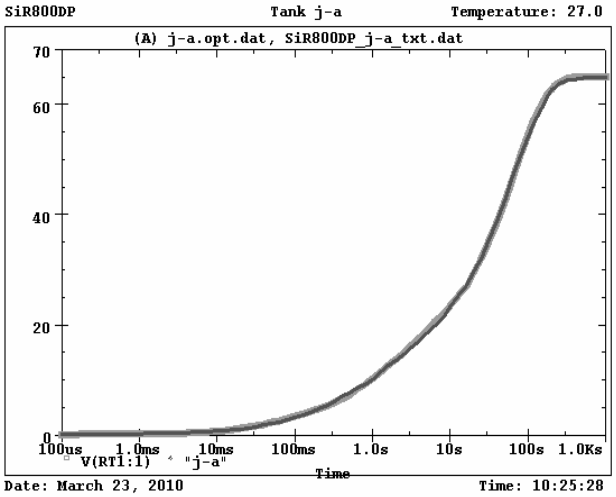
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

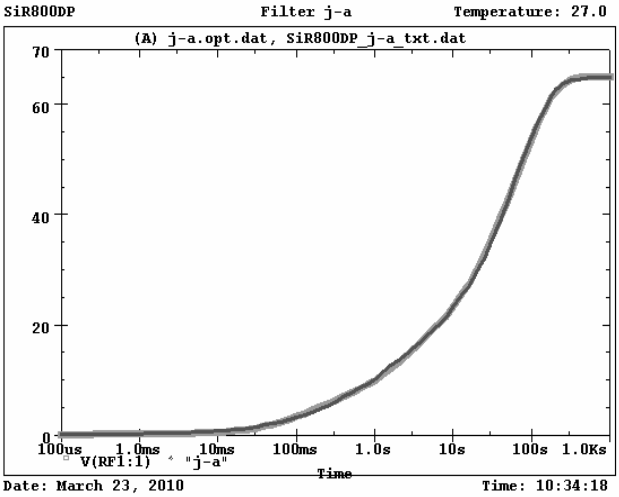
R-C THERMAL MODEL FOR FILTER CONFIGURATION

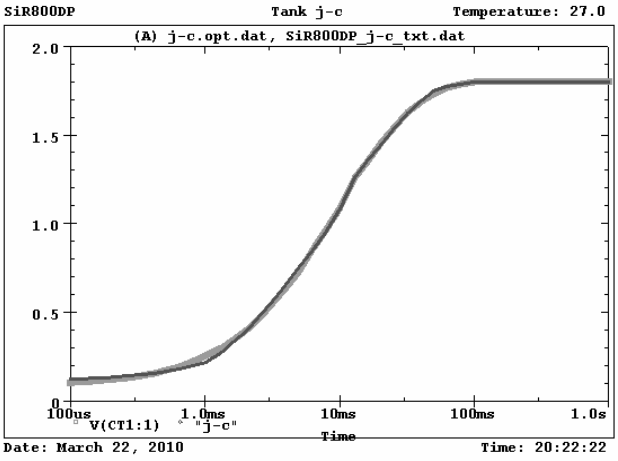


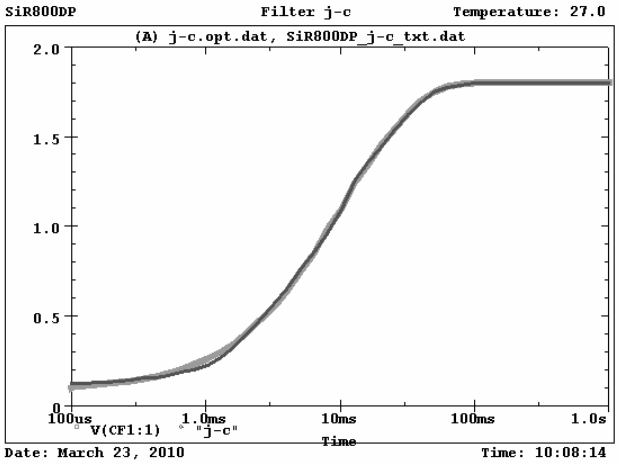
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.2717	99.7413 m	N/A
RF2	11.4800	950.0512 m	N/A
RF3	23.9727	298.4839 m	N/A
RF4	23.2756	451.7236 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	21.3235 m	375.0042 u	N/A
CF2	148.3433 m	5.0740 m	N/A
CF3	777.9184 m	1.5935 m	N/A
CF4	1.8653	24.5517 m	N/A

Note
N/A indicates not applicable


SiR800DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR800DP_j-a_txt.dat
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 23, 2010
Time: 10:25:28


SiR800DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiR800DP_j-a_txt.dat
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 23, 2010
Time: 10:34:18


SiR800DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR800DP_j-c_txt.dat
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: March 22, 2010
Time: 20:22:22


SiR800DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiR800DP_j-c_txt.dat
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: March 23, 2010
Time: 10:08:14