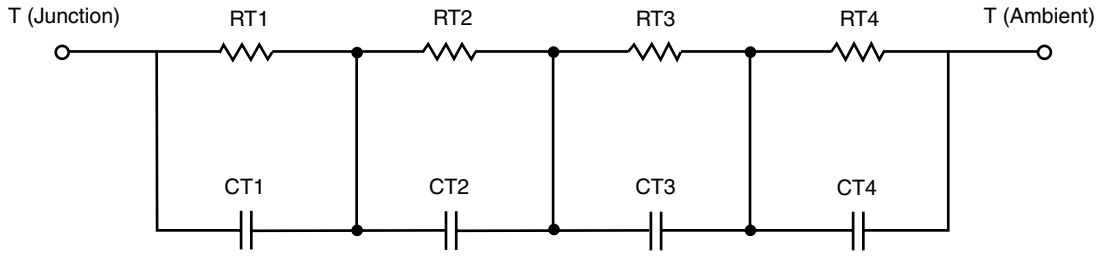
R-C Thermal Model Parameters

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

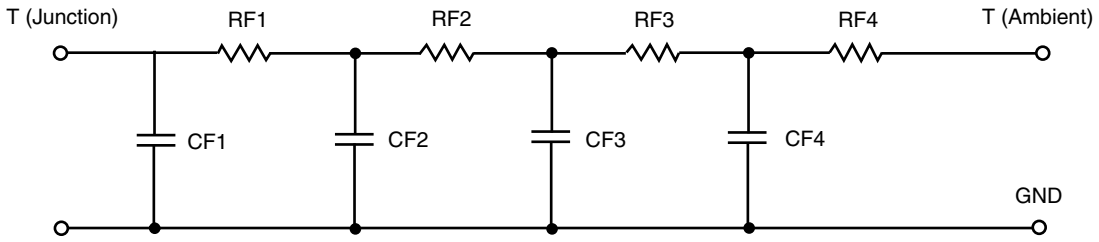


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	26.6524	629.7027 m	N/A
RT2	26.3028	635.9599 m	N/A
RT3	12.2041	80.8170 m	N/A
RT4	4.9121	1.4487	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.6386	1.3997 m	N/A
CT2	3.5623	15.2001 m	N/A
CT3	85.1864 m	143.4603 u	N/A
CT4	4.1205 m	5.7986 m	N/A

Note
N/A indicates not applicable

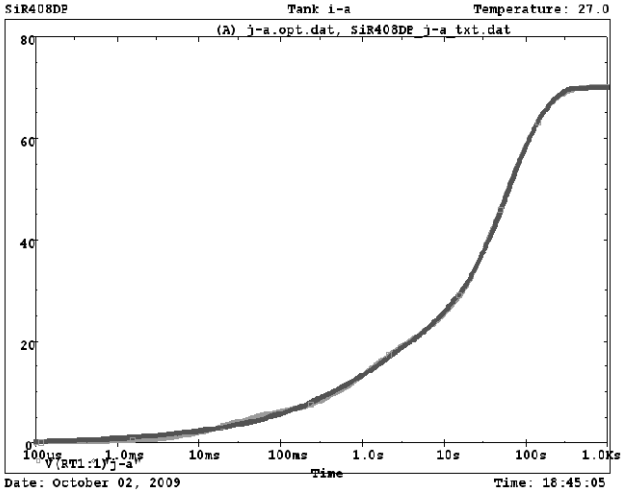
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

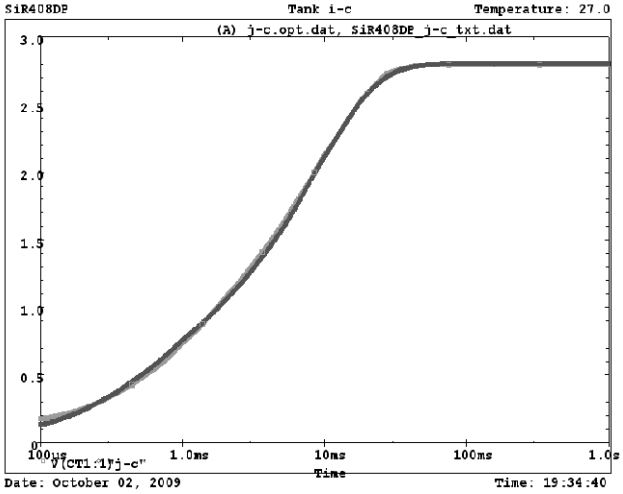
R-C THERMAL MODEL FOR FILTER CONFIGURATION

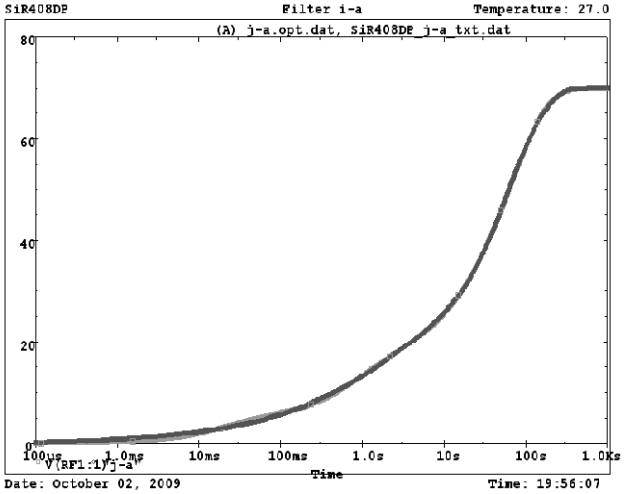


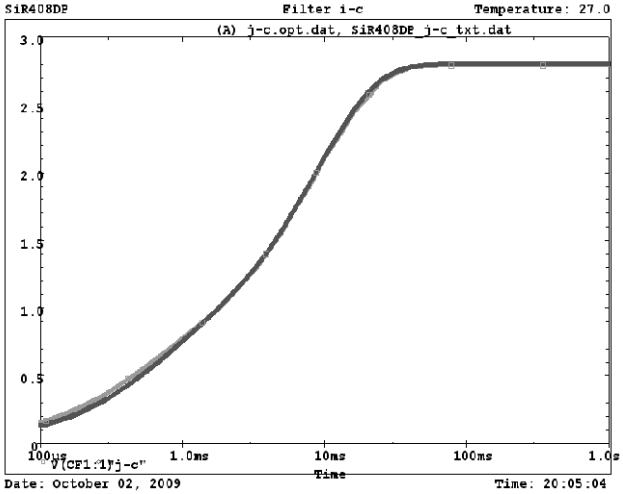
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.3248	788.4515 m	N/A
RF2	12.4381	1.2307	N/A
RF3	21.9571	667.7051 m	N/A
RF4	30.0884	103.4772 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.0113 m	585.8281 u	N/A
CF2	78.5055 m	3.2027 m	N/A
CF3	800.0587 m	2.4109 m	N/A
CF4	1.0703	23.6116 m	N/A

Note
N/A indicates not applicable


SiR408DP
Tank i-a
Temperature: 27.0
(A) j-a.opt.dat, SiR408DP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 02, 2009
Time: 18:45:05


SiR408DP
Tank i-c
Temperature: 27.0
(A) j-c.opt.dat, SiR408DP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: October 02, 2009
Time: 19:34:40


SiR408DP
Filter i-a
Temperature: 27.0
(A) j-a.opt.dat, SiR408DP_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 02, 2009
Time: 19:56:07


SiR408DP
Filter i-c
Temperature: 27.0
(A) j-c.opt.dat, SiR408DP_j-c_txt.dat
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: October 02, 2009
Time: 20:05:04