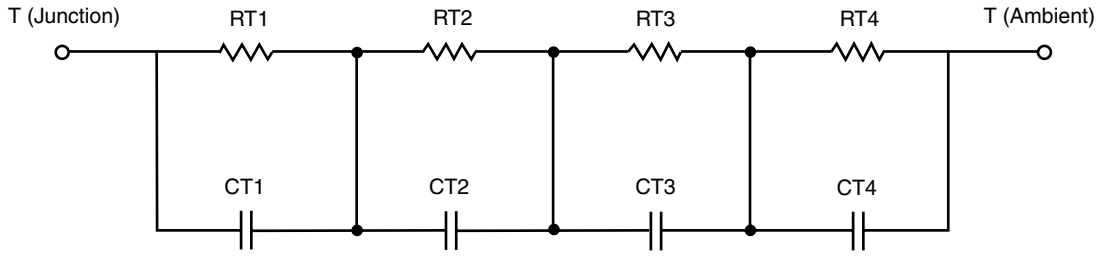
R-C Thermal Model Parameters

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

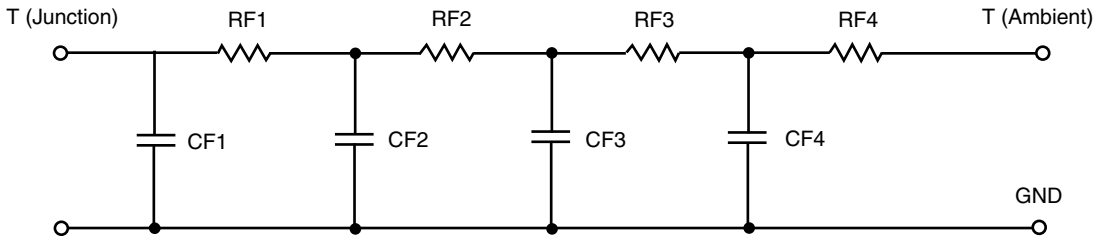


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	63.7575	N/A	16.6426
RT2	36.2988	N/A	6.4993
RT3	46.7664	N/A	5.2378
RT4	19.1773	N/A	21.6203
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.4016	N/A	13.4787 m
CT2	38.6423 m	N/A	12.5608 m
CT3	4.6896 m	N/A	725.4190 u
CT4	1.0254 m	N/A	39.5994 m

Note
N/A indicates not applicable

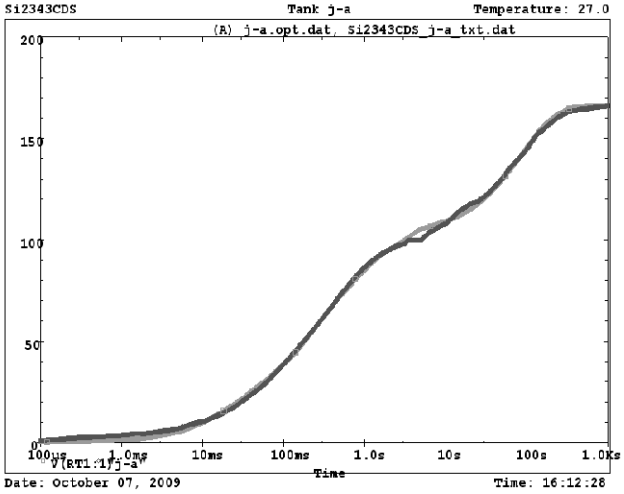
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

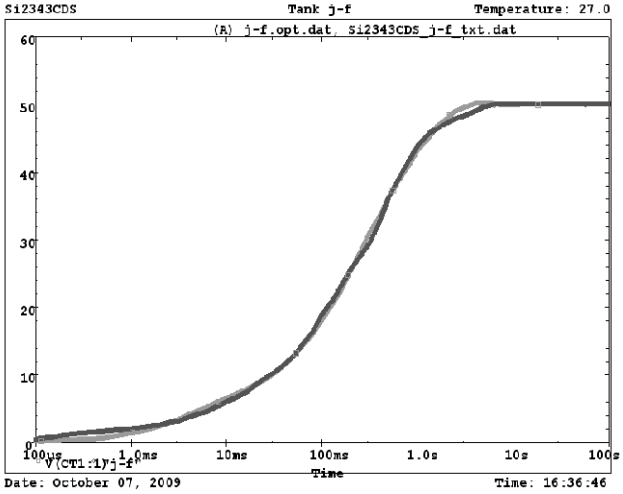
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	28.6038	N/A	3.6772
RF2	60.6030	N/A	21.4048
RF3	22.8280	N/A	7.2288
RF4	53.9652	N/A	17.6894
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	815.9453 u	N/A	261.2992 u
CF2	4.5514 m	N/A	3.6908 m
CF3	237.5688 m	N/A	19.0257 m
CF4	1.4740	N/A	2.0075 m

Note
N/A indicates not applicable


Si2343CDS
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, Si2343CDS_j-a_txt.dat
200
150
100
50
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: October 07, 2009
Time: 16:12:28


Si2343CDS
Tank j-f
Temperature: 27.0
(A) j-f.opt.dat, Si2343CDS_j-f_txt.dat
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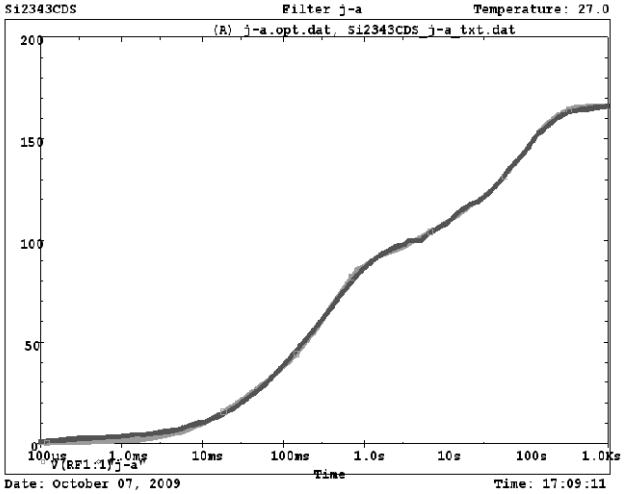
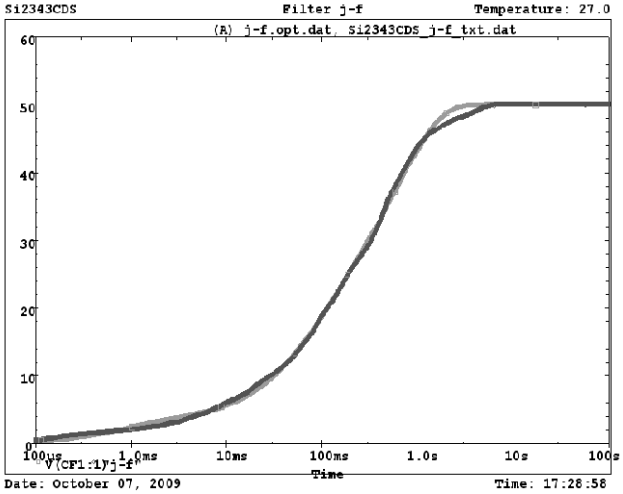
50
40
30
20
10
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)j-f
Time
Date: October 07, 2009
Time: 16:36:46


Si2343CDS
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, Si2343CDS_j-a_txt.dat
200
150
100
50
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 07, 2009
Time: 17:09:11


Si2343CDS
Filter j-f
Temperature: 27.0
(A) j-f.opt.dat, Si2343CDS_j-f_txt.dat
60
50
40
30
20
10
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)j-f
Time
Date: October 07, 2009
Time: 17:28:58