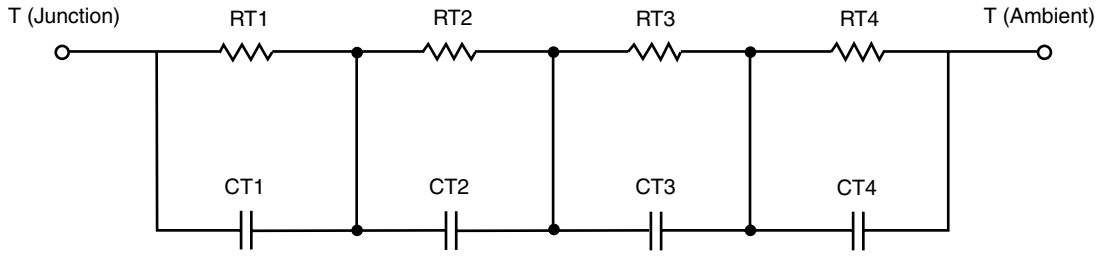
R-C Thermal Model Parameters

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

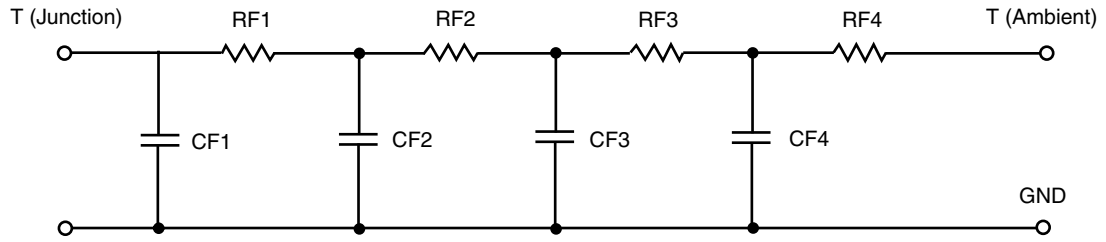


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.8615	N/A	11.4493
RT2	46.1252	N/A	27.4200
RT3	39.6459	N/A	26.0457
RT4	50.3664	N/A	24.9593
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	176.1896 u	N/A	72.5167 u
CT2	1.2915 m	N/A	3.6944 m
CT3	12.8507 m	N/A	700.8137 u
CT4	1.4505	N/A	1.3702 m

Note
N/A indicates not applicable

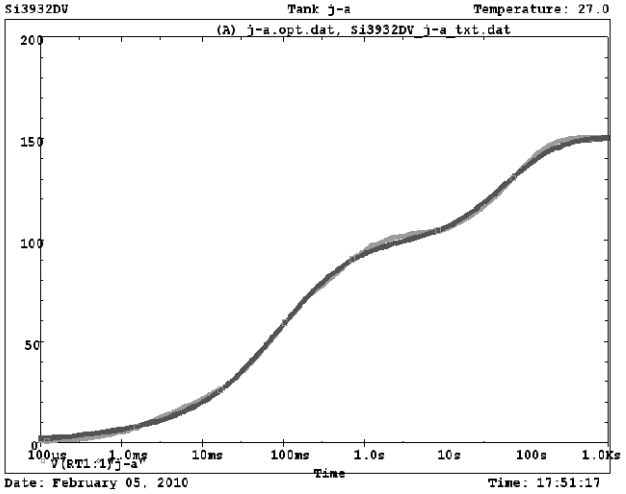
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

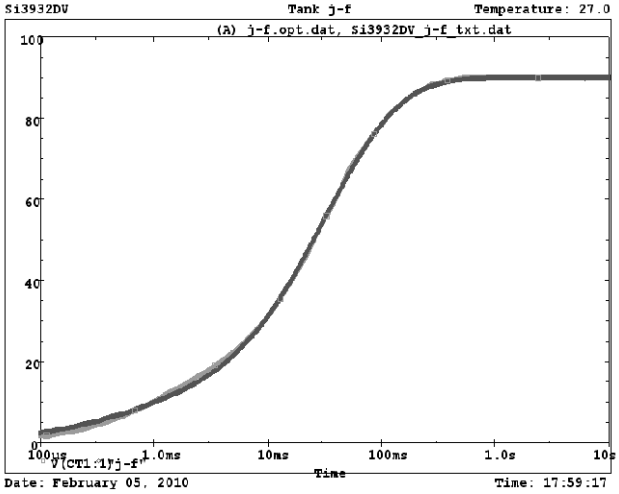
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.0019	N/A	15.1544
RF2	53.4507	N/A	32.2783
RF3	33.9623	N/A	29.2519
RF4	49.5851	N/A	13.3027
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	102.2003 u	N/A	63.9325 u
CF2	878.4586 u	N/A	315.2523 u
CF3	13.6139 m	N/A	373.9146 u
CF4	1.4463	N/A	7.1475 m

Note
N/A indicates not applicable


Si3932DV
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, Si3932DV_j-a_txt.dat
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: February 05, 2010
Time: 17:51:17


Si3932DV
Tank j-f
Temperature: 27.0
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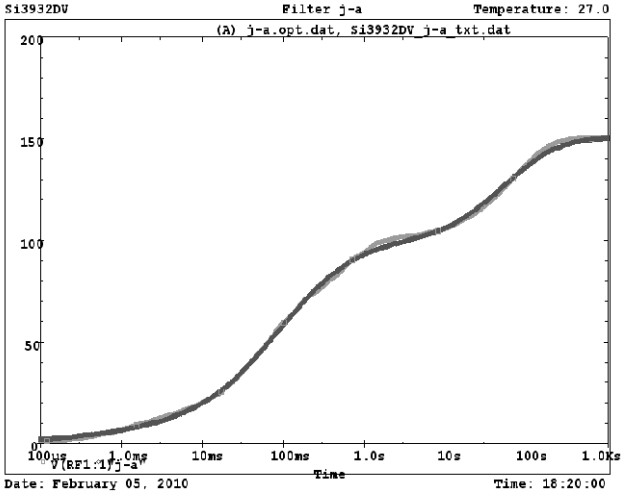
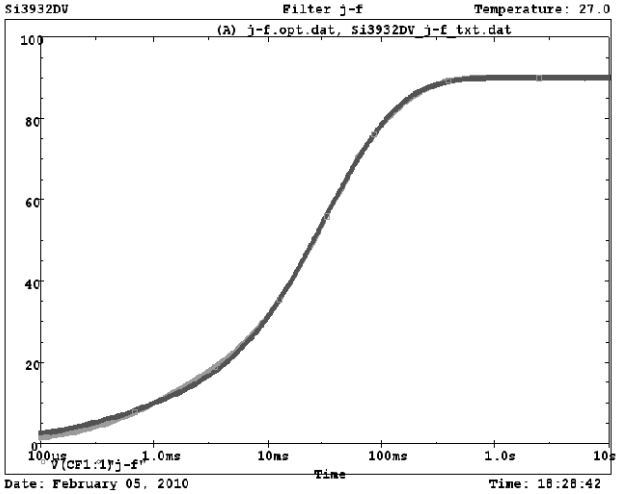
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-f
Time
Date: February 05, 2010
Time: 17:59:17


Si3932DV
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, Si3932DV_j-a_txt.dat
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: February 05, 2010
Time: 18:20:00


Si3932DV
Filter j-f
Temperature: 27.0
(A) j-f.opt.dat, Si3932DV_j-f_txt.dat
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-f
Time
Date: February 05, 2010
Time: 18:28:42