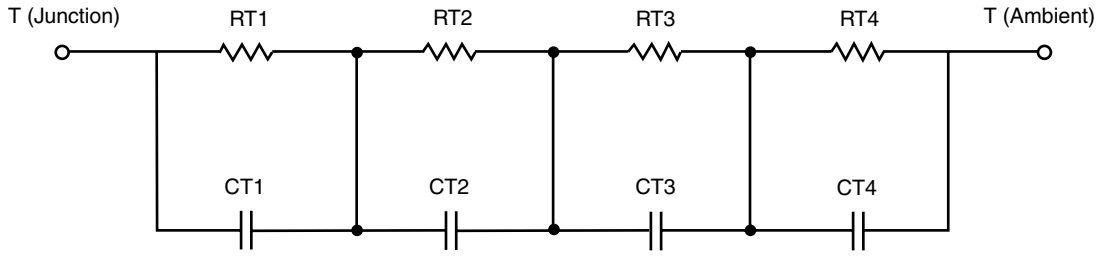
R-C Thermal Model Parameters

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

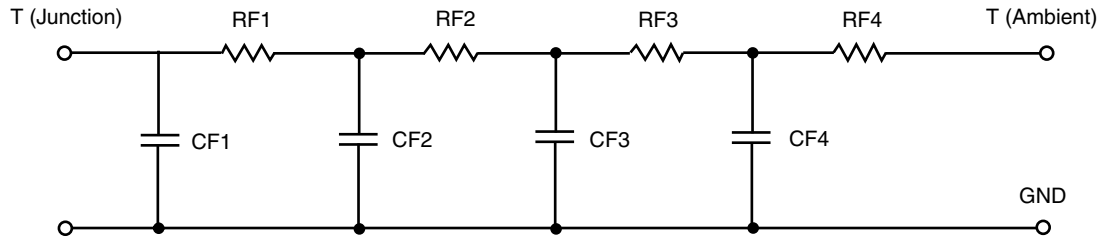


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.1882	N/A	11.5506
RT2	47.4831	N/A	21.3494
RT3	47.4637	N/A	32.6898
RT4	68.0177	N/A	9.1793
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	556.0338 u	N/A	20.4118 m
CT2	2.8459 m	N/A	4.2453 m
CT3	20.0690 m	N/A	597.1847 u
CT4	1.1583	N/A	81.0180 u

Note
N/A indicates not applicable

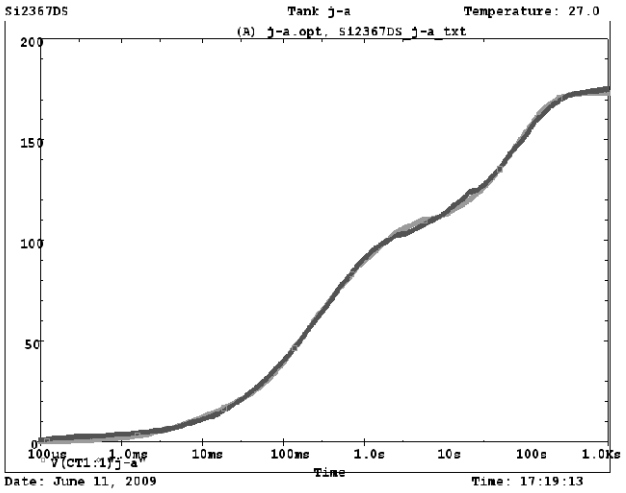
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

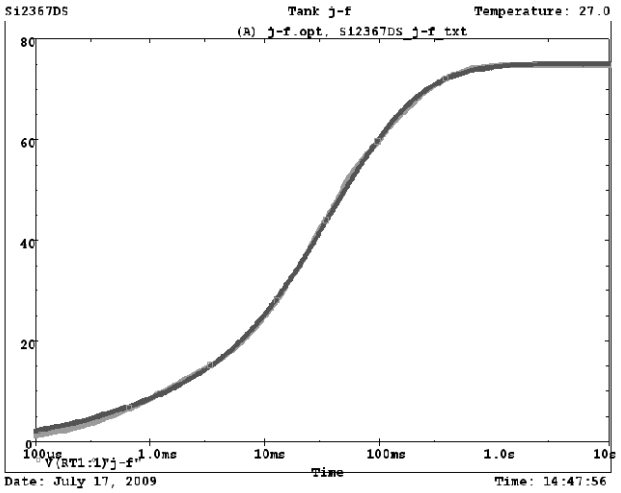
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	28.1522	N/A	13.1788
RF2	63.9968	N/A	28.6292
RF3	24.8632	N/A	21.1359
RF4	56.7829	N/A	11.7446
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	727.4816 u	N/A	72.5903 u
CF2	3.9917 m	N/A	446.4217 u
CF3	181.8782 m	N/A	1.0748 m
CF4	1.4120	N/A	13.2074 m

Note
N/A indicates not applicable


Si2367DS
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si2367DS_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(CT1:1)j-a
Time
Date: June 11, 2009
Time: 17:19:13


Si2367DS
Tank j-f
Temperature: 27.0
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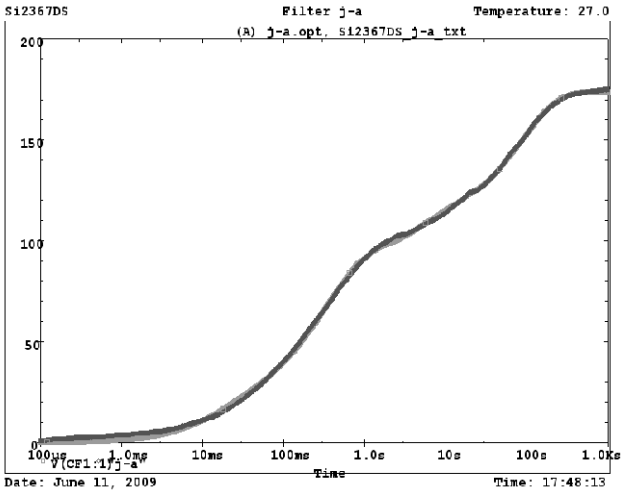
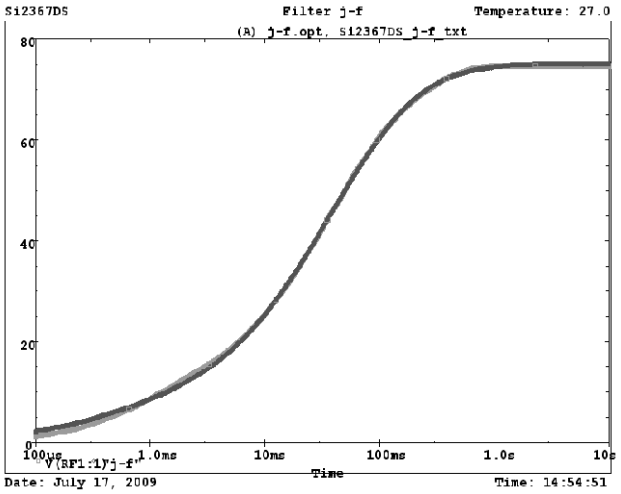
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(RT1:1)j-f
Time
Date: July 17, 2009
Time: 14:47:56


Si2367DS
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si2367DS_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(CF1:1)j-a
Time
Date: June 11, 2009
Time: 17:48:13


Si2367DS
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si2367DS_j-f_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(RF1:1)j-f
Time
Date: July 17, 2009
Time: 14:54:51