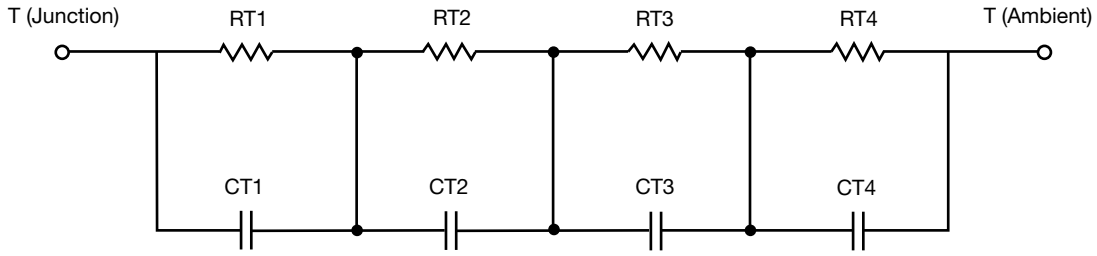
R-C Thermal Model Parameters

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

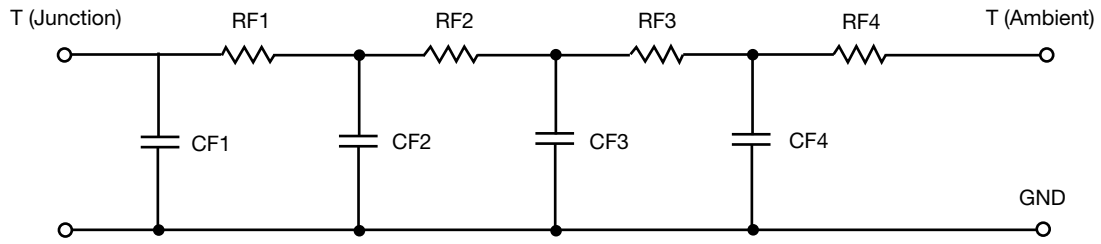


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.3780	1.3617	N/A
RT2	15.8939	988.1115m	N/A
RT3	13.8213	3.1280	N/A
RT4	42.9086	1.4793	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.7877m	198.3682u	N/A
CT2	906.4323m	3.6729m	N/A
CT3	84.9633m	4.8766m	N/A
CT4	2.2178	4.3667m	N/A

Note
N/A indicates not applicable

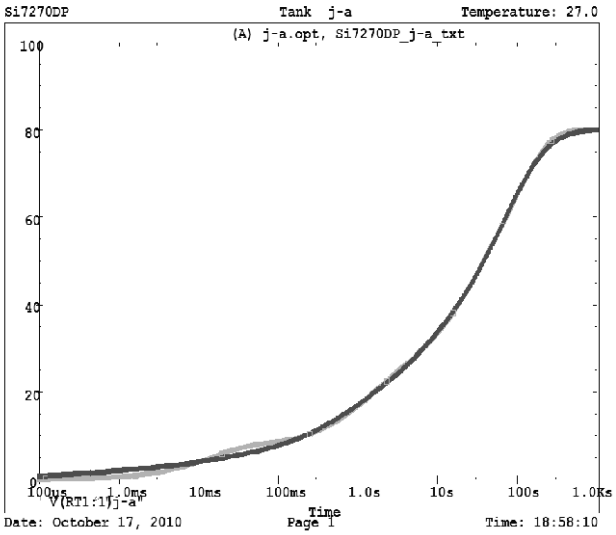
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

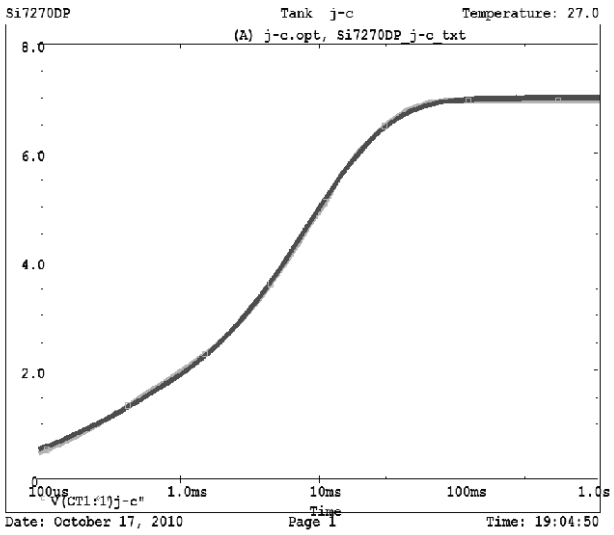
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.4661	1.0938	N/A
RF2	13.2752	2.4513	N/A
RF3	22.1627	2.7621	N/A
RF4	40.0960	648.6752m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	521.8632u	139.3396u	N/A
CF2	29.5856m	564.4161u	N/A
CF3	304.1279m	2.7019m	N/A
CF4	1.7713	3.2852m	N/A

Note
N/A indicates not applicable


Si7270DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si7270DP_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a"
Time
Date: October 17, 2010
Page 1
Time: 18:58:10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Tank j-c
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6.0
4.0
2.0
0
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1.0ms
10ms
100ms
1.0s
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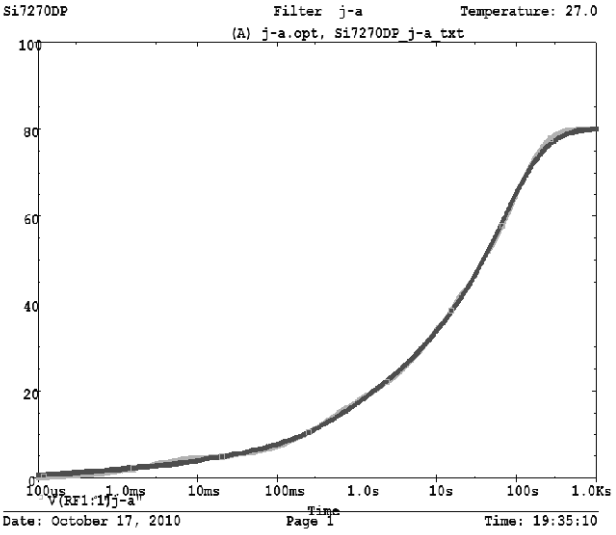
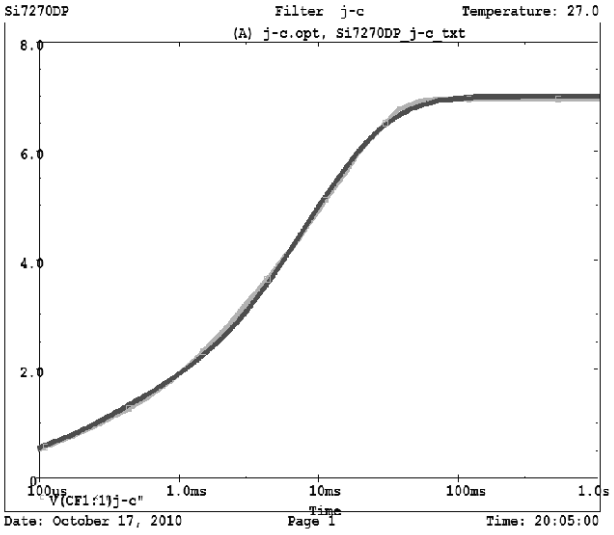
Time
Date: October 17, 2010
Page 1
Time: 19:04:50


Si7270DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si7270DP_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: October 17, 2010
Page 1
Time: 19:35:10


Si7270DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, Si7270DP_j-c_txt
8.0
6.0
4.0
2.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: October 17, 2010
Page 1
Time: 20:05:00