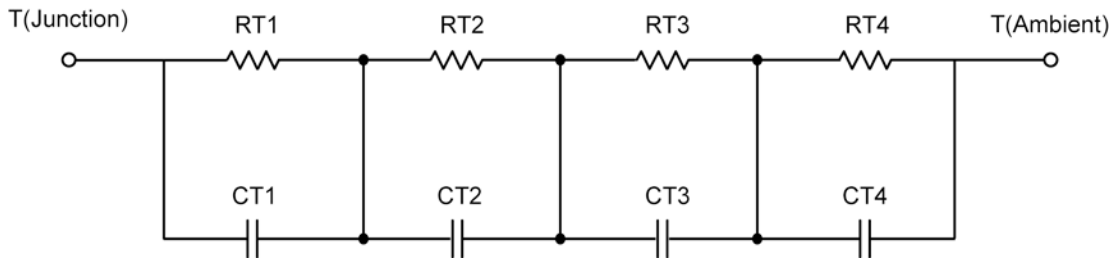
R-C Thermal Model Parameters

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."

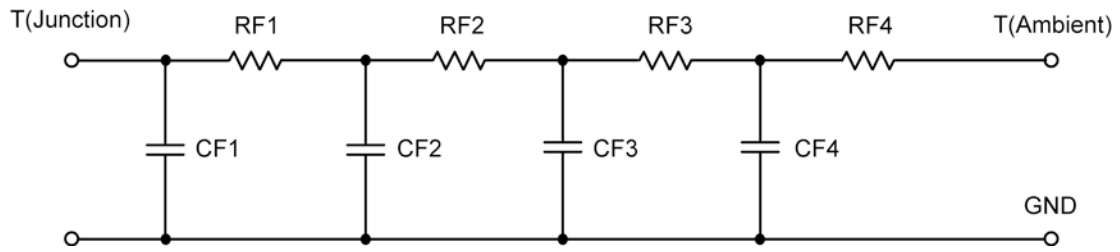
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.8336	772.2000 m	N/A
RT2	13.0221	1.1867	N/A
RT3	11.9864	1.4744	N/A
RT4	55.1579	1.9667	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.7044 m	272.2830 u	N/A
CT2	108.6719 m	5.2253 m	N/A
CT3	659.5846 u	3.1851 m	N/A
CT4	1.5240	1.2049 m	N/A

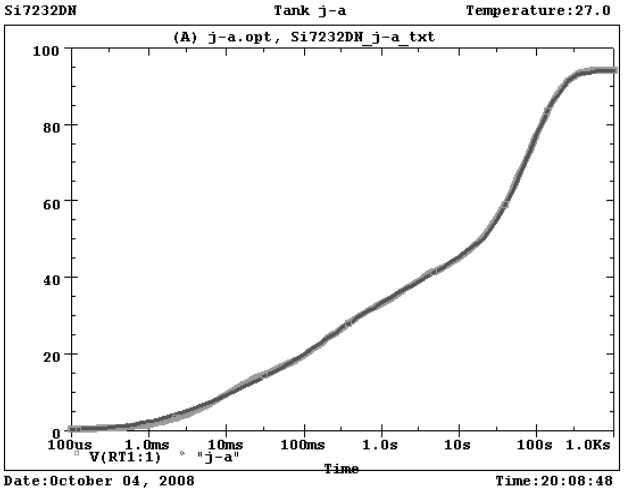
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

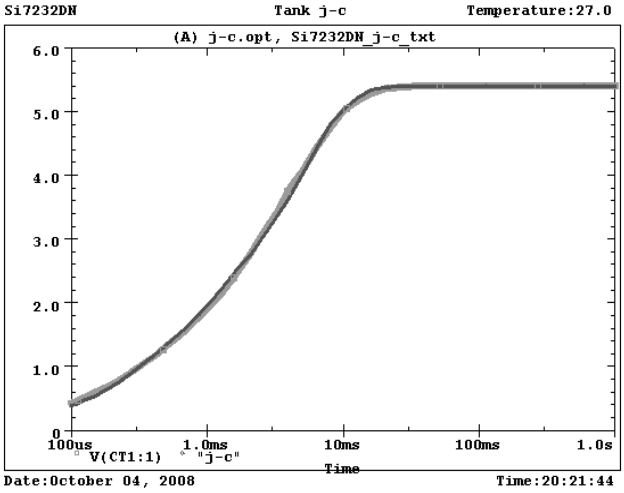
R-C THERMAL MODEL FOR FILTER CONFIGURATION

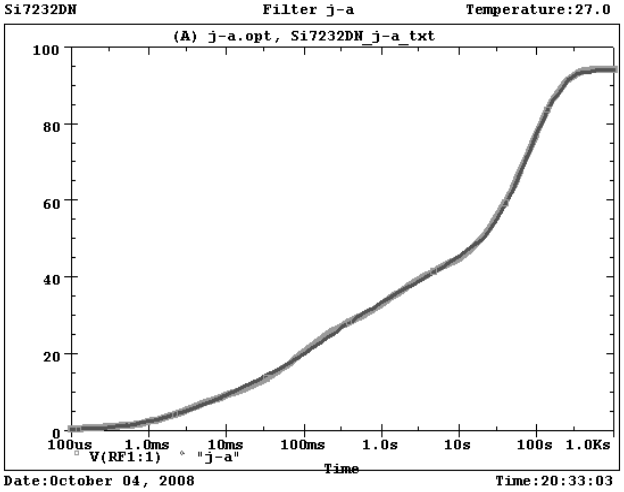


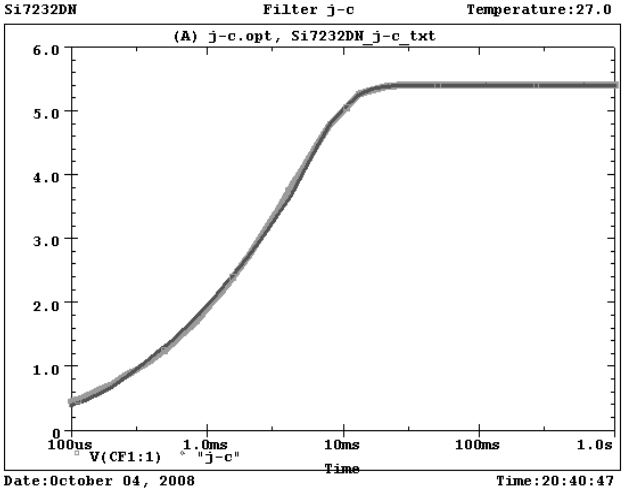
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.8028	957.1000 m	N/A
RF2	17.1534	1.6848	N/A
RF3	14.3596	1.4522	N/A
RF4	53.6842	1.3059	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	383.2541 u	175.6001 u	N/A
CF2	4.3011 m	349.2834 u	N/A
CF3	81.5798 m	729.6148 u	N/A
CF4	1.4555	231.7503 u	N/A

Note
NA indicates not applicable


Si7232DN
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7232DN_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 04, 2008
Time:20:08:48


Si7232DN
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7232DN_j-c_txt
6.0
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date:October 04, 2008
Time:20:21:44


Si7232DN
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7232DN_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 04, 2008
Time:20:33:03


Si7232DN
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7232DN_j-c_txt
6.0
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date:October 04, 2008
Time:20:40:47