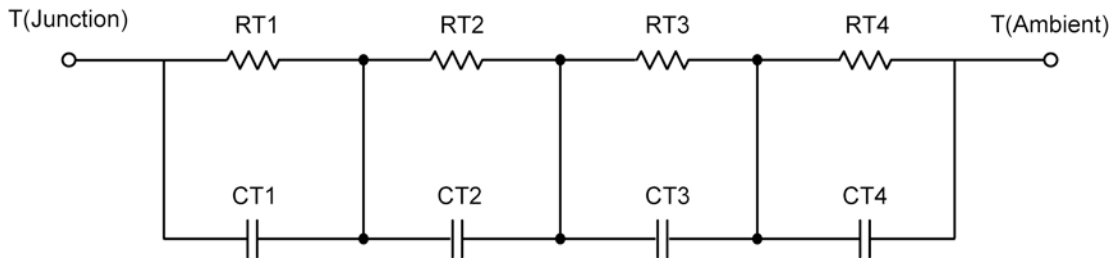
R-C Thermal Model Parameters

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."

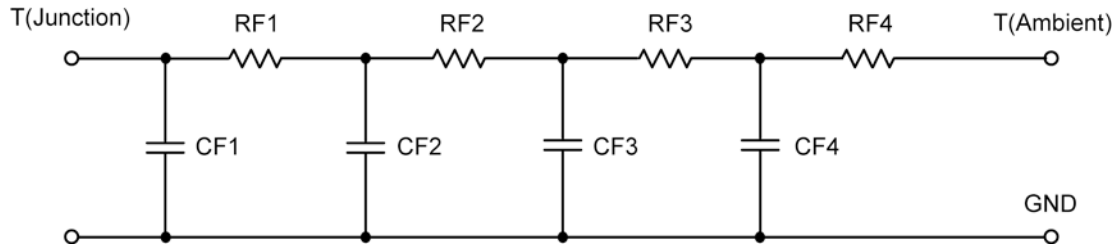
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	14.2502	165.3723 m	N/A
RT2	47.4875	685.2277 m	N/A
RT3	9.2965	1.1888	N/A
RT4	9.9658	1.1606	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	12.4147 m	200.4258 u	N/A
CT2	1.7991	702.5415 u	N/A
CT3	201.4269 m	21.8483 m	N/A
CT4	657.5218 u	8.1922 m	N/A

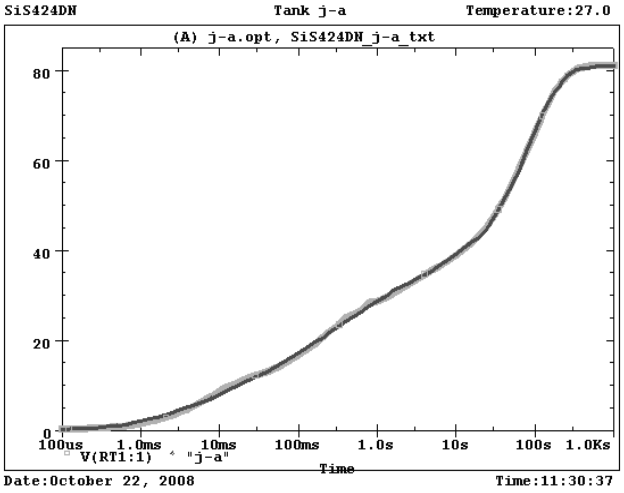
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

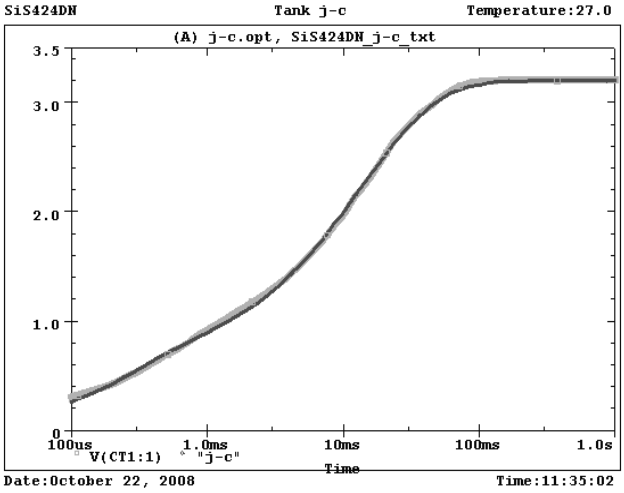
R-C THERMAL MODEL FOR FILTER CONFIGURATION

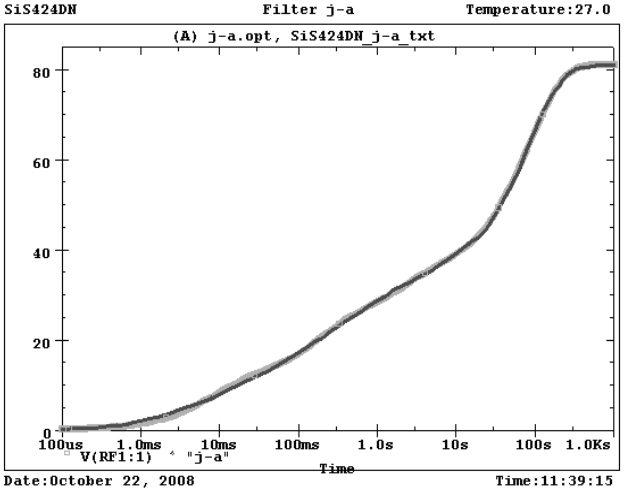


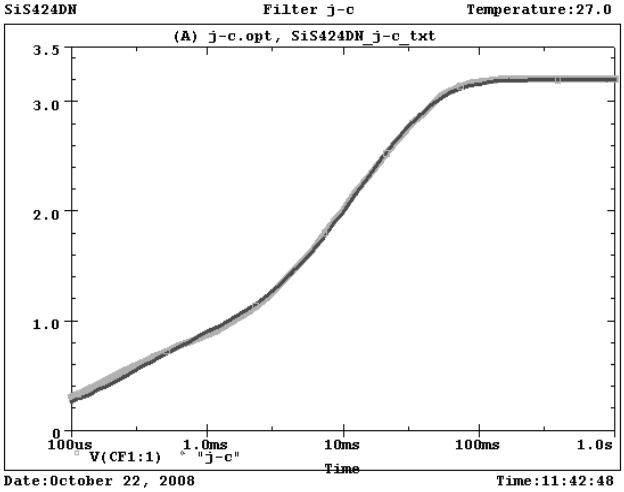
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	11.4706	725.5945 m	N/A
RF2	13.3952	908.1701 m	N/A
RF3	10.7402	663.0285 m	N/A
RF4	45.3940	903.2069 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	661.8381 u	257.9020 u	N/A
CF2	10.8584 m	3.7360 m	N/A
CF3	146.2275 m	188.7966 u	N/A
CF4	1.7110	19.0953 m	N/A

Note
NA indicates not applicable


SiS424DN
Tank j-a
Temperature:27.0
(A) j-a.opt, SiS424DN_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:October 22, 2008
Time:11:30:37


SiS424DN
Tank j-c
Temperature:27.0
(A) j-c.opt, SiS424DN_j-c_txt
3.5
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date:October 22, 2008
Time:11:35:02


SiS424DN
Filter j-a
Temperature:27.0
(A) j-a.opt, SiS424DN_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:October 22, 2008
Time:11:39:15


SiS424DN
Filter j-c
Temperature:27.0
(A) j-c.opt, SiS424DN_j-c_txt
3.5
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date:October 22, 2008
Time:11:42:48