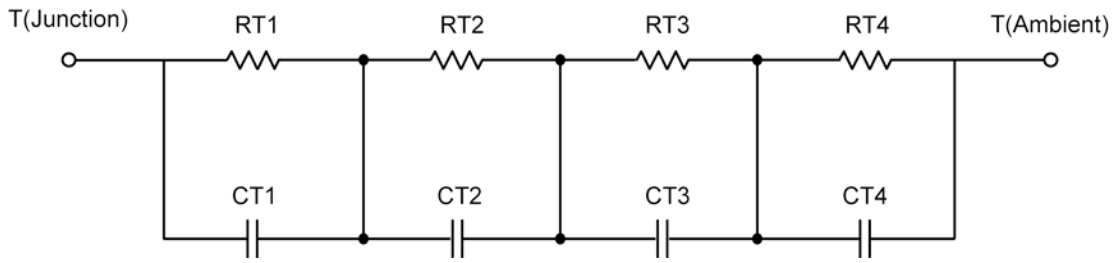
R-C Thermal Model Parameters

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."

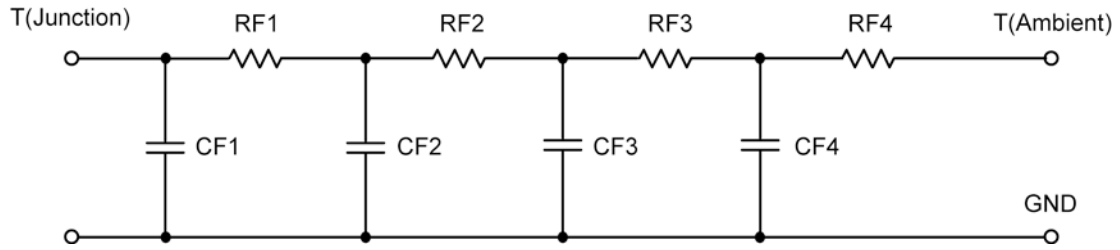
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	6.1559	746.6000 m	N/A
RT2	14.7162	3.0344	N/A
RT3	17.2013	1.4784	N/A
RT4	42.9266	2.7406	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	602.5703 u	1.4620 m	N/A
CT2	348.6285 m	14.0658 m	N/A
CT3	16.9889 m	140.8596 u	N/A
CT4	2.1900	2.5035 m	N/A

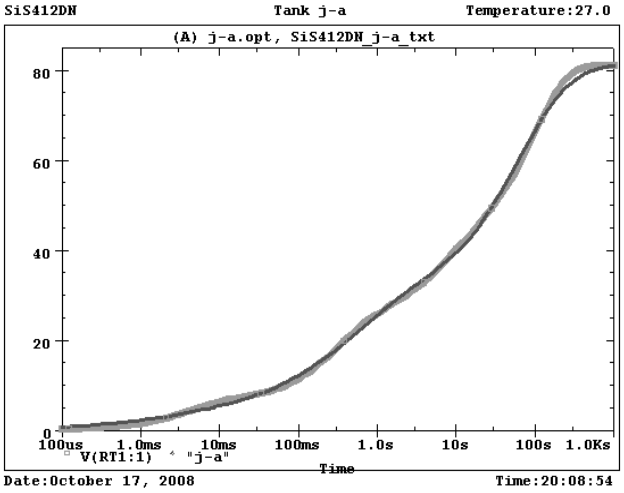
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

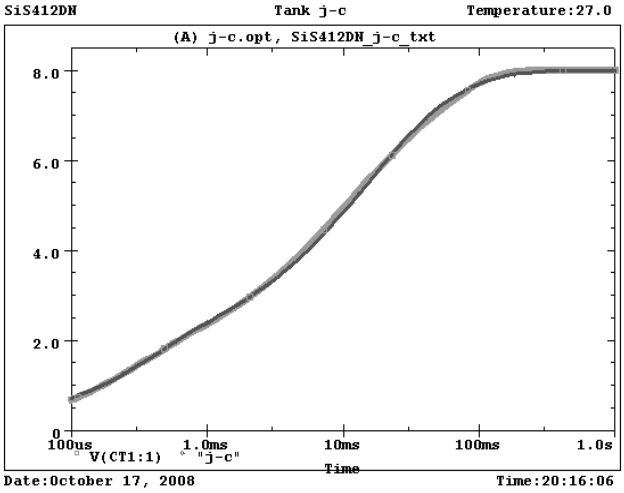
R-C THERMAL MODEL FOR FILTER CONFIGURATION

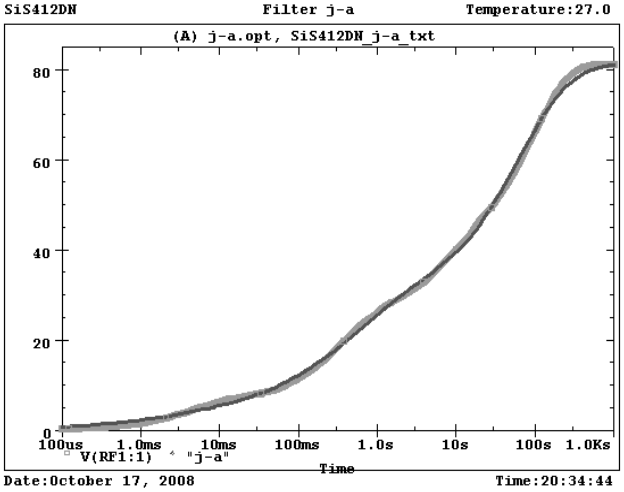


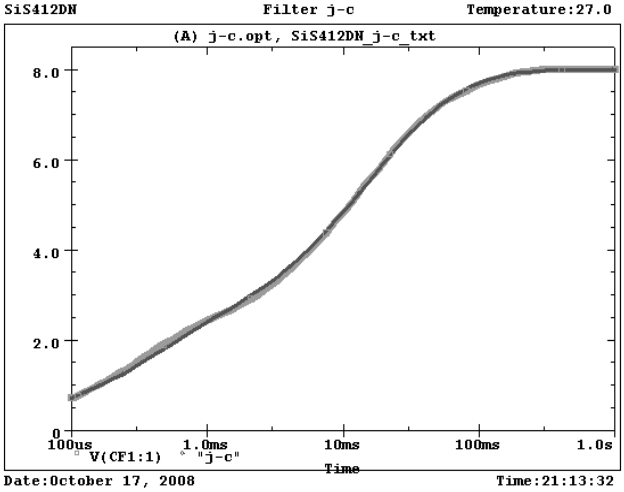
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.6824	2.2496	N/A
RF2	19.7485	2.9785	N/A
RF3	18.5959	1.9512	N/A
RF4	35.9732	820.7000 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	603.4429 u	119.9523 u	N/A
CF2	16.6061 m	1.9816 m	N/A
CF3	389.9565 m	4.5122 m	N/A
CF4	2.2443	72.6905 m	N/A

Note
NA indicates not applicable


SiS412DN
Tank j-a
Temperature:27.0
(A) j-a.opt, SiS412DN_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 17, 2008
Time:20:08:54


SiS412DN
Tank j-c
Temperature:27.0
(A) j-c.opt, SiS412DN_j-c_txt
8.0
6.0
4.0
2.0
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date:October 17, 2008
Time:20:16:06


SiS412DN
Filter j-a
Temperature:27.0
(A) j-a.opt, SiS412DN_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 17, 2008
Time:20:34:44


SiS412DN
Filter j-c
Temperature:27.0
(A) j-c.opt, SiS412DN_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, 2008
Time:21:13:32