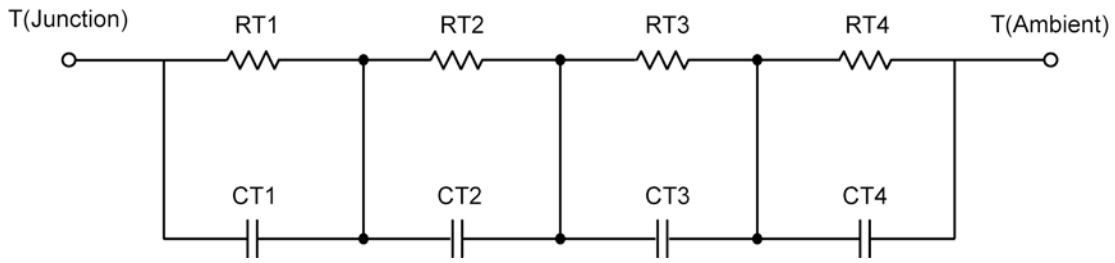
R-C Thermal Model Parameters

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."

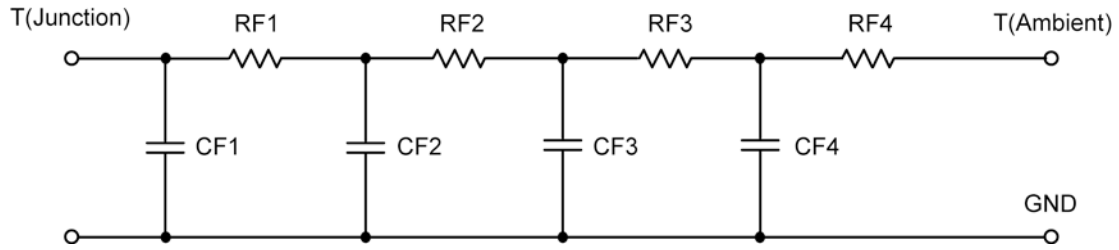
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.9514	410.9036 m	N/A
RT2	14.9518	1.7096	N/A
RT3	12.4654	170.2892 m	N/A
RT4	51.6314	109.2072 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	725.0400 u	2.0896 m	N/A
CT2	17.6303 m	5.5105 m	N/A
CT3	378.3024 m	13.0553 m	N/A
CT4	1.2316	2.0851 m	N/A

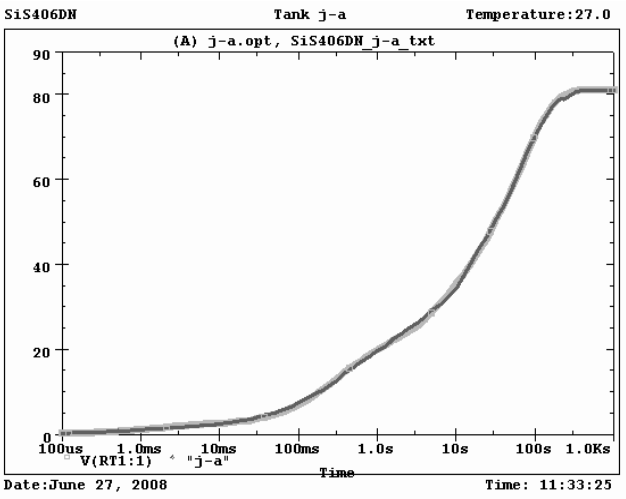
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

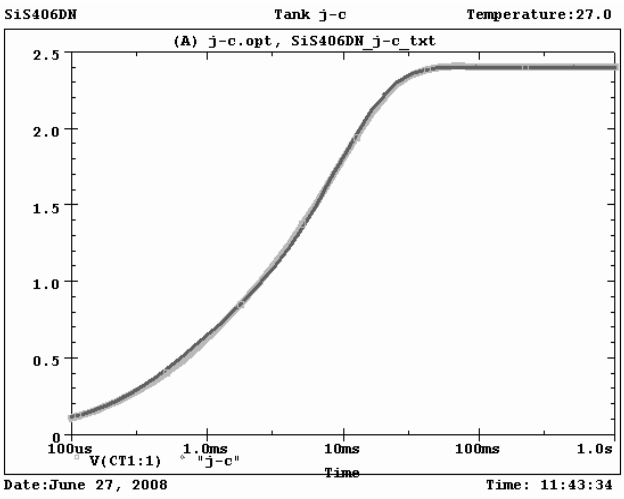
R-C THERMAL MODEL FOR FILTER CONFIGURATION

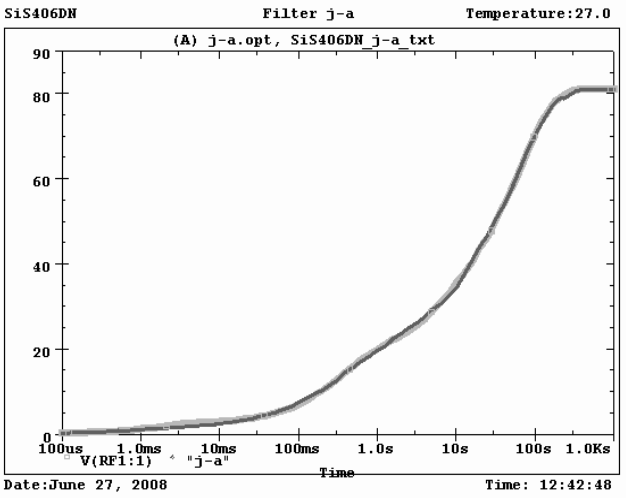


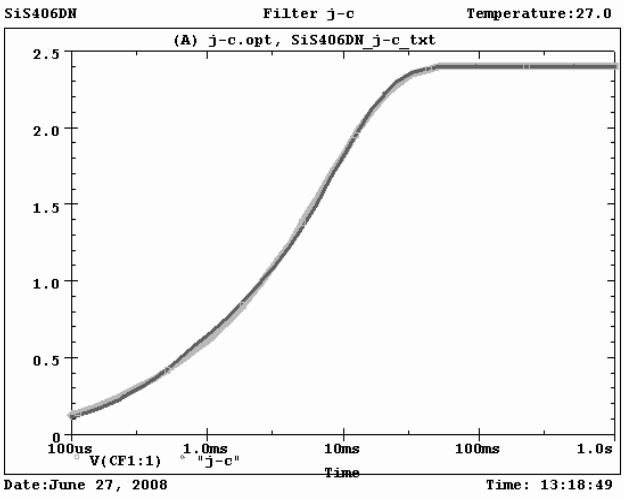
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.5939	493.4603 m	N/A
RF2	17.1113	1.1237	N/A
RF3	20.9932	758.6662 m	N/A
RF4	40.3016	24.1735 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	633.8388 u	691.3182 u	N/A
CF2	18.6181 m	2.1611 m	N/A
CF3	345.2406 m	7.3052 m	N/A
CF4	1.1967	326.9063 m	N/A

Note
NA indicates not applicable


SiS406DN
Tank j-a
Temperature:27.0
(A) j-a.opt, SiS406DN_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:June 27, 2008
Time: 11:33:25


SiS406DN
Tank j-c
Temperature:27.0
(A) j-c.opt, SiS406DN_j-c_txt
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date:June 27, 2008
Time: 11:43:34


SiS406DN
Filter j-a
Temperature:27.0
(A) j-a.opt, SiS406DN_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:June 27, 2008
Time: 12:42:48


SiS406DN
Filter j-c
Temperature:27.0
(A) j-c.opt, SiS406DN_j-c_txt
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date:June 27, 2008
Time: 13:18:49