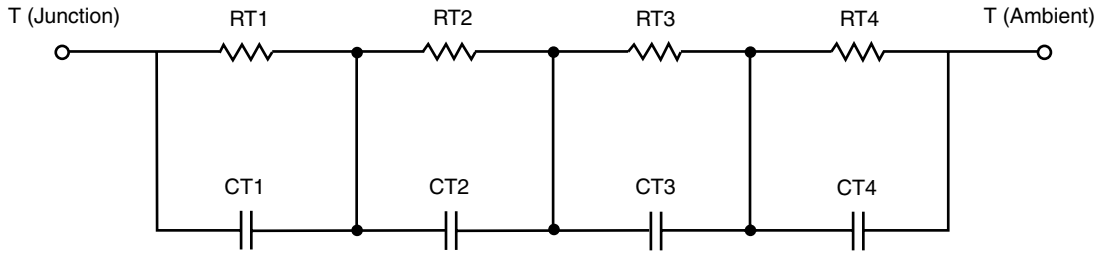
R-C Thermal Model Parameters

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

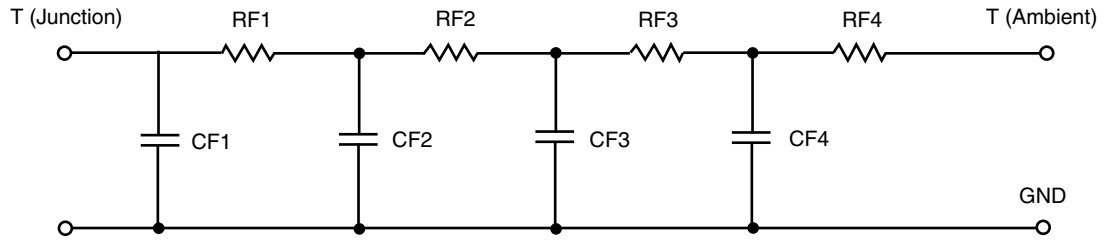


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.9441	673.9934 m	N/A
RT2	51.0599	253.4066 m	N/A
RT3	12.8526	2.2864	N/A
RT4	4.1434	1.2862	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	18.8252 m	472.2501 u	N/A
CT2	1.2509	2.6016 m	N/A
CT3	172.9480 m	6.8418 m	N/A
CT4	3.5989 m	6.0239 m	N/A

Note
N/A indicates not applicable

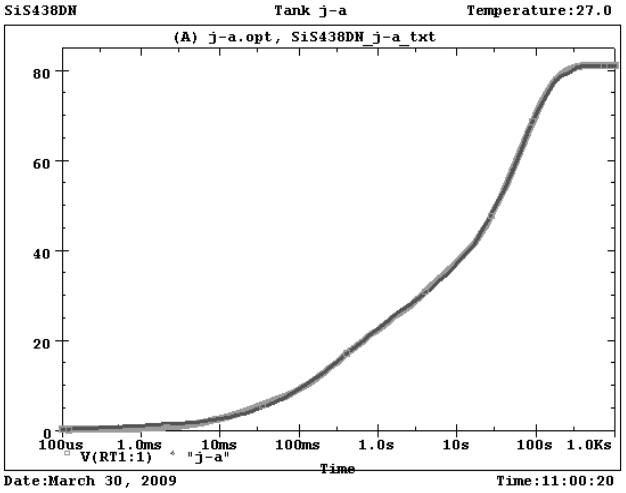
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

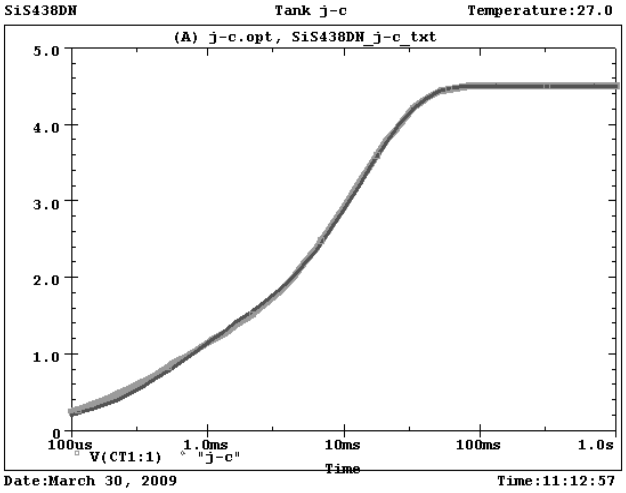
R-C THERMAL MODEL FOR FILTER CONFIGURATION

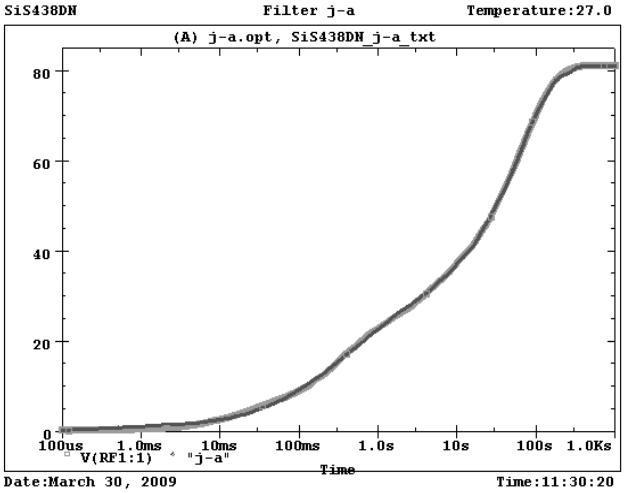


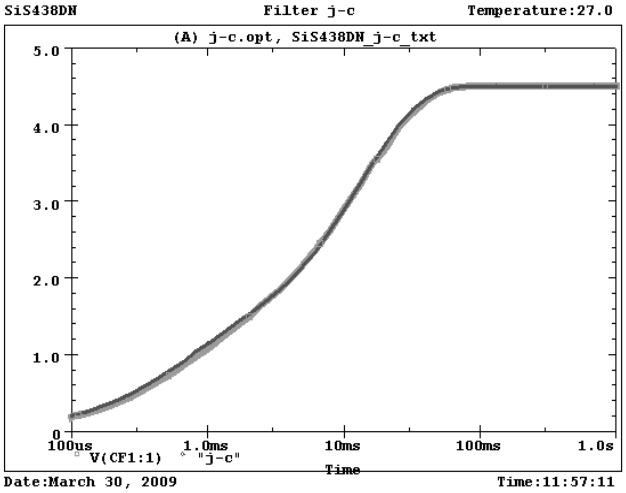
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.9305	1.2556	N/A
RF2	16.4088	411.5000 m	N/A
RF3	14.3323	1.6001	N/A
RF4	44.3284	1.2328	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.8902 m	494.1678 u	N/A
CF2	16.6776 m	1.7627 m	N/A
CF3	270.9227 m	1.5072 m	N/A
CF4	1.1509	4.2103 m	N/A

Note
N/A indicates not applicable


SiS438DN
Tank j-a
Temperature:27.0
(A) j-a.opt, SiS438DN_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:March 30, 2009
Time:11:00:20


SiS438DN
Tank j-c
Temperature:27.0
(A) j-c.opt, SiS438DN_j-c_txt
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:March 30, 2009
Time:11:12:57


SiS438DN
Filter j-a
Temperature:27.0
(A) j-a.opt, SiS438DN_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:March 30, 2009
Time:11:30:20


SiS438DN
Filter j-c
Temperature:27.0
(A) j-c.opt, SiS438DN_j-c_txt
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:March 30, 2009
Time:11:57:11