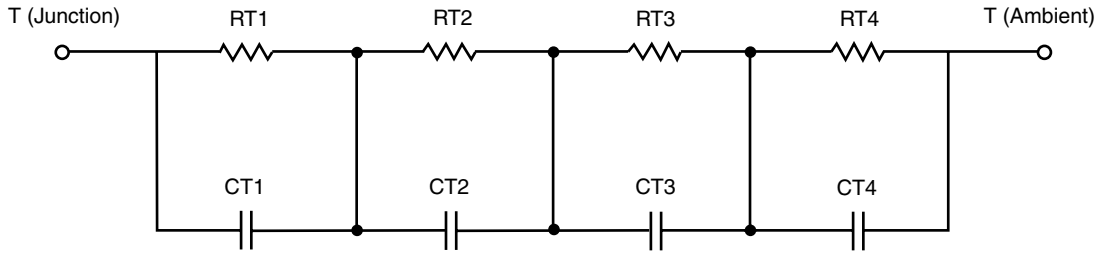
R-C Thermal Model Parameters

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

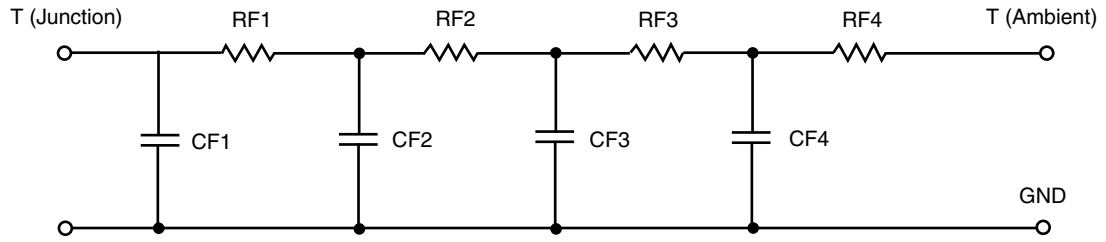


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.6040	674.4294 m	N/A
RT2	7.8075	432.1657 m	N/A
RT3	9.5733	355.2329 m	N/A
RT4	51.0152	1.5437	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	879.3629 u	9.9364 m	N/A
CT2	20.0397 m	1.0662 m	N/A
CT3	264.4477 m	5.4043 m	N/A
CT4	1.3156	6.4892 m	N/A

Note
N/A indicates not applicable

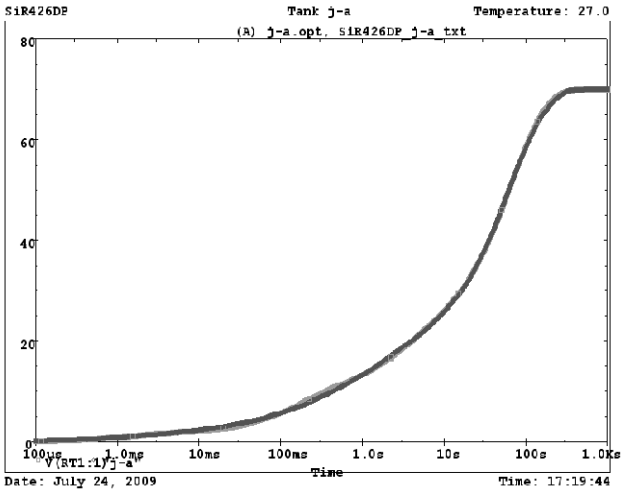
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

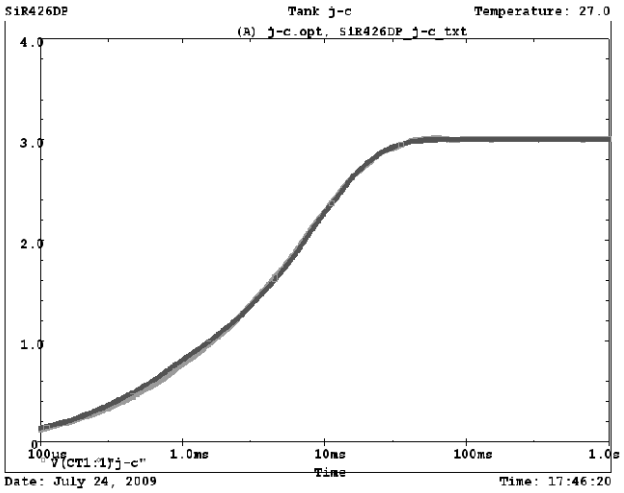
R-C THERMAL MODEL FOR FILTER CONFIGURATION

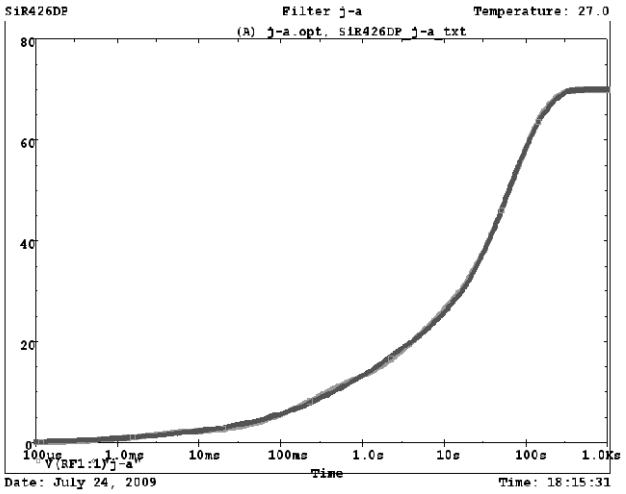


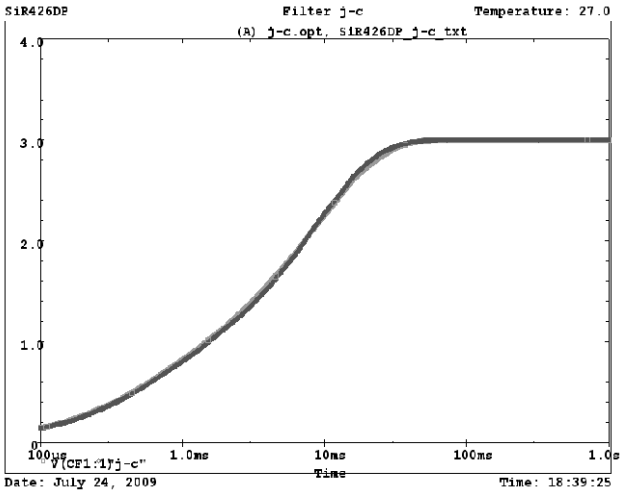
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.0230	899.6395 m	N/A
RF2	9.2803	1.0283	N/A
RF3	14.0031	628.9437 m	N/A
RF4	44.6936	443.1168 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0105 m	625.8340 u	N/A
CF2	20.5451 m	2.4459 m	N/A
CF3	261.1064 m	2.4824 m	N/A
CF4	1.2354	10.2564 m	N/A

Note
N/A indicates not applicable


SiR426DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR426DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
Time
V(RT1:1)/j-a
Date: July 24, 2009
Time: 17:19:44


SiR426DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiR426DP_j-c_txt
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
Time
V(CT1:1)/j-c"
Date: July 24, 2009
Time: 17:46:20


SiR426DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR426DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
Time
V(RF1:1)/j-a"
Date: July 24, 2009
Time: 18:15:31


SiR426DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR426DP_j-c_txt
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
Time
V(CF1:1)/j-c"
Date: July 24, 2009
Time: 18:39:25