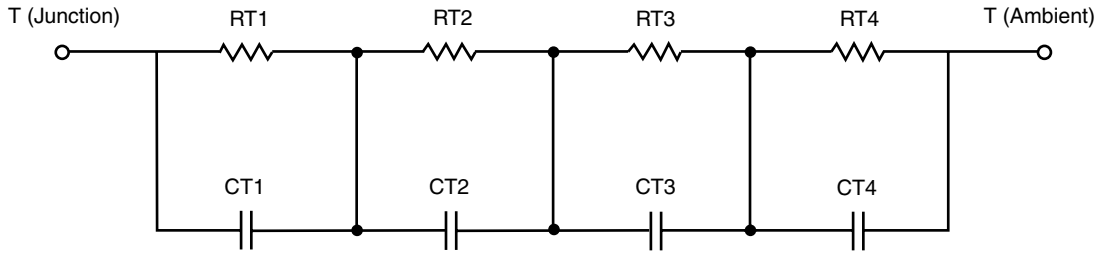
R-C Thermal Model Parameters

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

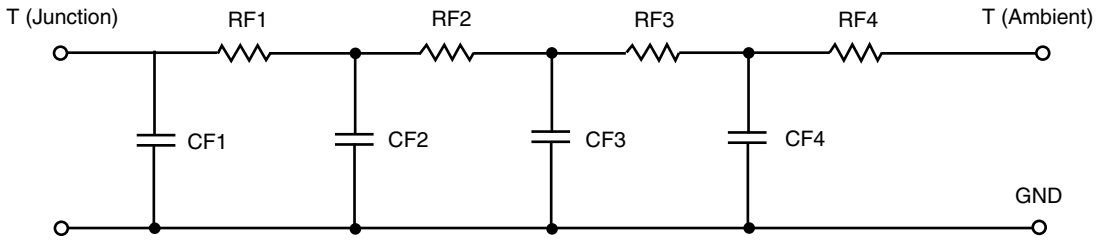


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	16.1016	255.9317 m	N/A
RT2	15.5348	2.5783	N/A
RT3	4.3870	712.8683 m	N/A
RT4	33.9766	1.9529	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	67.6261 m	1.9555 m	N/A
CT2	2.3937	47.0435 m	N/A
CT3	3.8231 m	1.7740 m	N/A
CT4	2.1662	19.6546 m	N/A

Note
N/A indicates not applicable

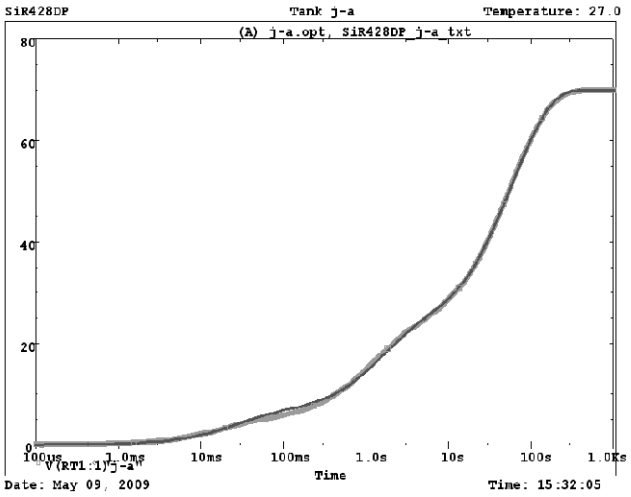
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

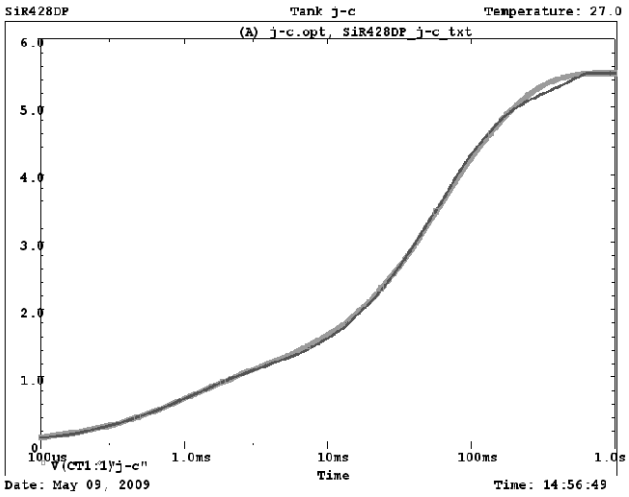
R-C THERMAL MODEL FOR FILTER CONFIGURATION

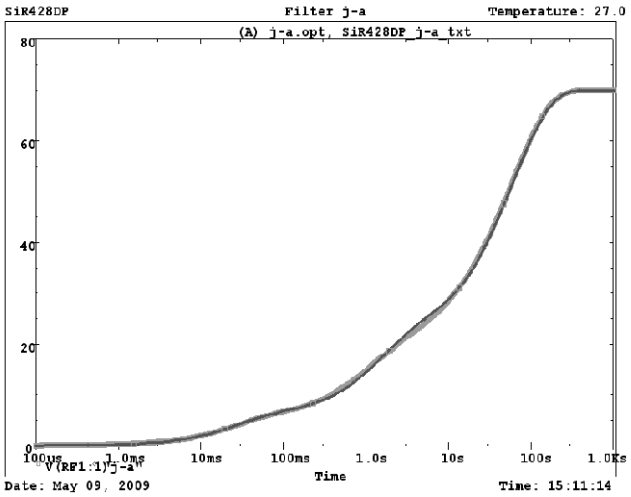


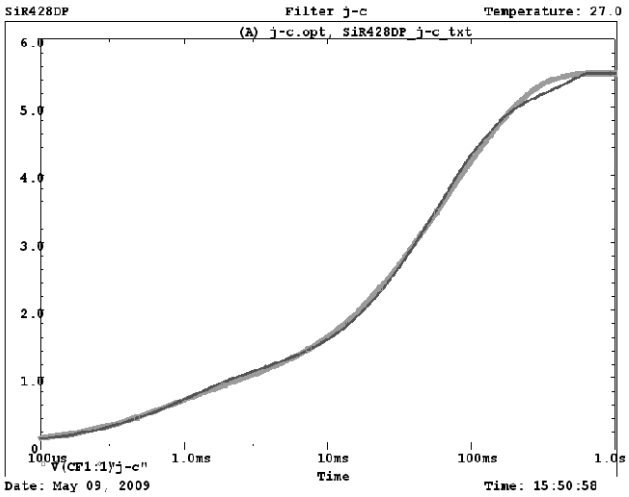
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.0056	861.8400 m	N/A
RF2	14.4164	688.0600 m	N/A
RF3	19.1753	2.2783	N/A
RF4	30.4027	1.6718	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.0394 m	820.8229 u	N/A
CF2	65.1433 m	6.4387 m	N/A
CF3	719.6466 m	6.3330 m	N/A
CF4	998.1853 m	43.0668 m	N/A

Note
N/A indicates not applicable


SiR428DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR428DP_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: May 09, 2009
Time: 15:32:05


SiR428DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiR428DP_j-c_txt
6.0
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: May 09, 2009
Time: 14:56:49


SiR428DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR428DP_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: May 09, 2009
Time: 15:11:14


SiR428DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR428DP_j-c_txt
6.0
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: May 09, 2009
Time: 15:50:58