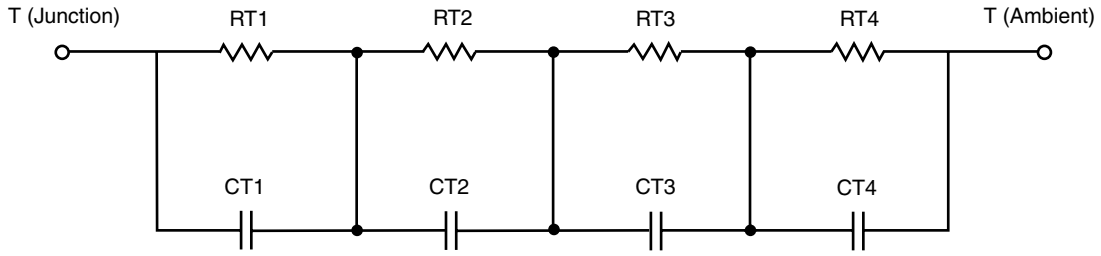
R-C Thermal Model Parameters

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

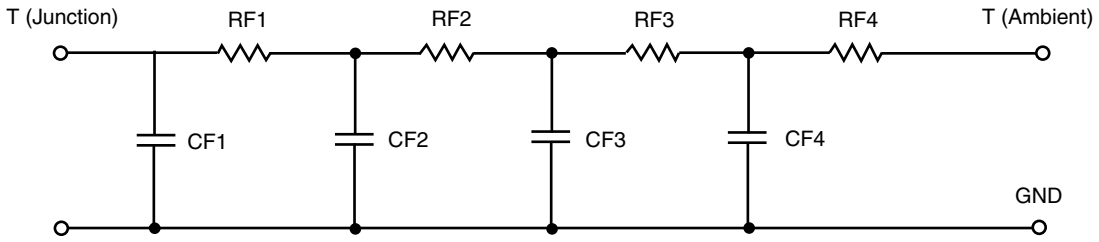


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	26.2986	205.7139 m	N/A
RT2	13.9336	4.2478	N/A
RT3	16.4062	3.4003	N/A
RT4	48.3616	1.6837	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.2486 m	50.3799 m	N/A
CT2	434.0017 m	71.3200 u	N/A
CT3	302.5368 u	269.4253 u	N/A
CT4	1.8236	1.1967 m	N/A

Note
N/A indicates not applicable

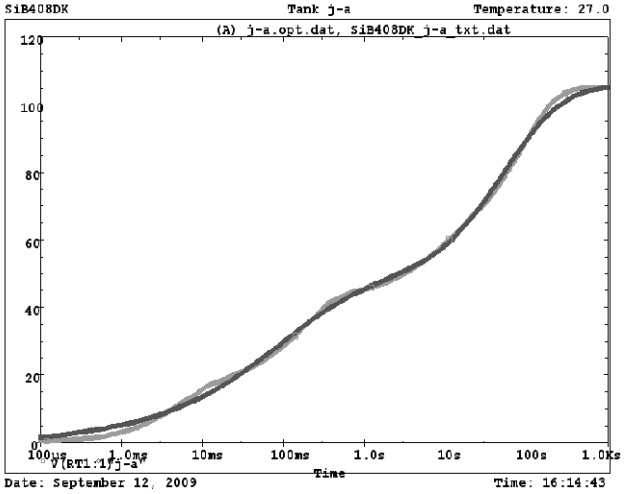
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

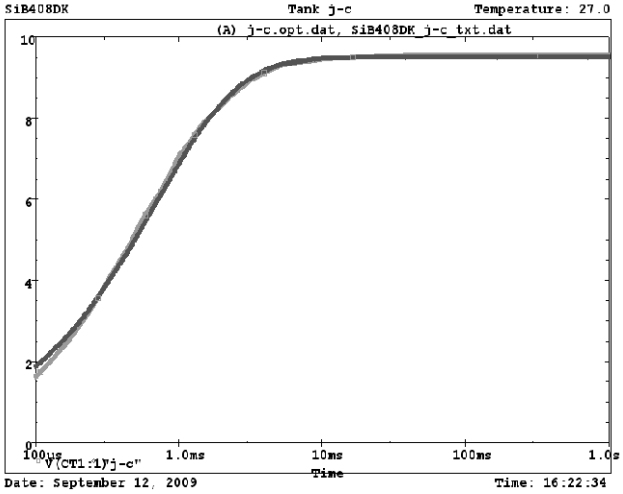
R-C THERMAL MODEL FOR FILTER CONFIGURATION

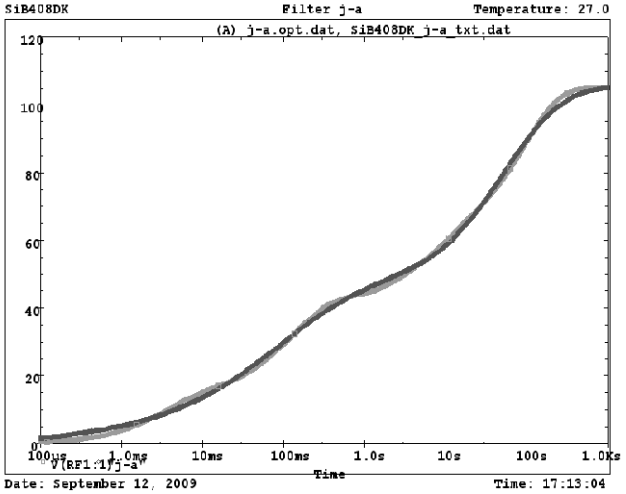


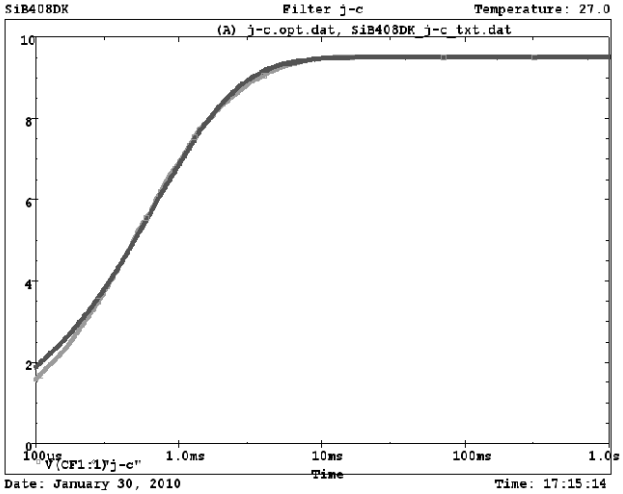
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.2150	6.3267	N/A
RF2	26.8484	1.7165	N/A
RF3	22.8744	738.0095 m	N/A
RF4	40.0622	718.8542 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	225.4652 u	55.3981 u	N/A
CF2	4.3518 m	162.6350 u	N/A
CF3	304.5855 m	738.9367 u	N/A
CF4	2.0242	1.2737 m	N/A

Note
N/A indicates not applicable


SiB408DK
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiB408DK_j-a_txt.dat
120
100
80
60
40
20
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: September 12, 2009
Time: 16:14:43


SiB408DK
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiB408DK_j-c_txt.dat
10
8
6
4
2
0
100µs
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c
Time
Date: September 12, 2009
Time: 16:22:34


SiB408DK
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiB408DK_j-a_txt.dat
120
100
80
60
40
20
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: September 12, 2009
Time: 17:13:04


SiB408DK
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiB408DK_j-c_txt.dat
10
8
6
4
2
0
100µs
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c
Time
Date: January 30, 2010
Time: 17:15:14