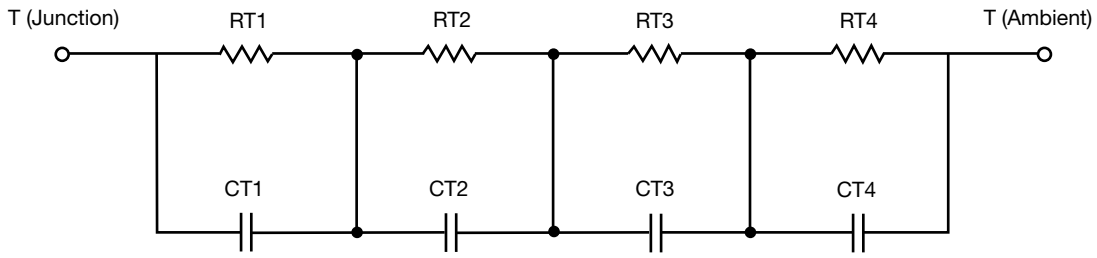
R-C Thermal Model Parameters

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

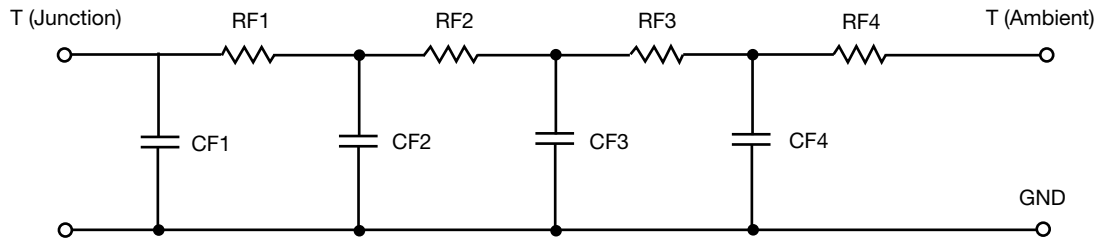


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.6023	1.5202	N/A
RT2	6.8890	2.3339	N/A
RT3	17.3730	2.0000	N/A
RT4	44.0357	2.1301	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	399.4274m	4.3187m	N/A
CT2	726.0053u	160.2484u	N/A
CT3	19.7343m	8.4748m	N/A
CT4	2.2118	20.9768m	N/A

Note
N/A indicates not applicable

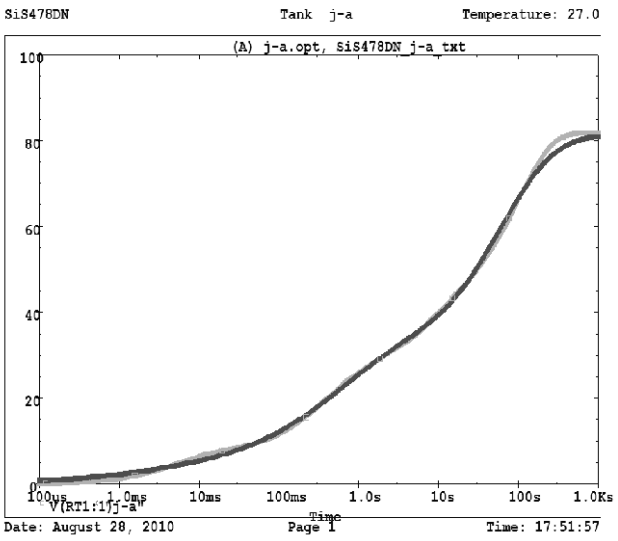
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

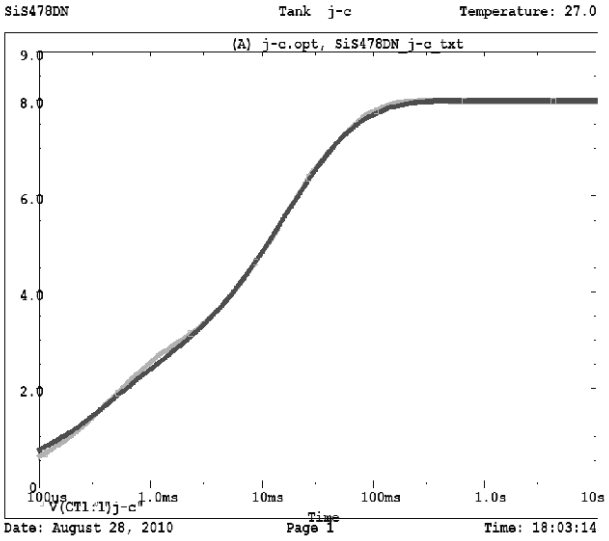
R-C THERMAL MODEL FOR FILTER CONFIGURATION

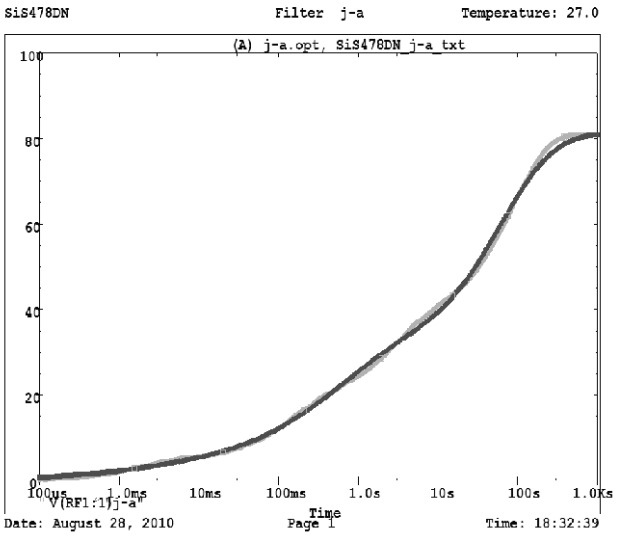


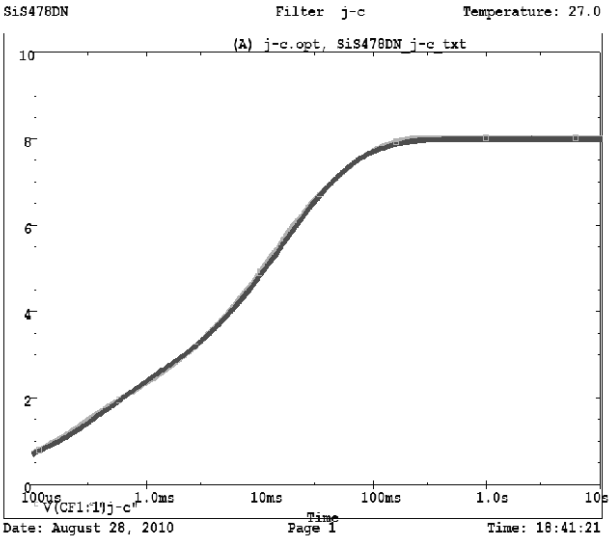
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.8830	1.9259	N/A
RF2	15.1801	1.7878	N/A
RF3	19.1132	2.8604	N/A
RF4	41.8237	1.4461	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	359.8430u	109.1922u	N/A
CF2	9.1967m	1.0507m	N/A
CF3	133.2230m	2.2910m	N/A
CF4	1.9897	27.2132m	N/A

Note
N/A indicates not applicable


SiS478DN
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiS478DN_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: August 28, 2010
Page 1
Time: 17:51:57


SiS478DN
Tank j-c
Temperature: 27.0
(A) j-c.opt, SiS478DN_j-c_txt
9.0
8.0
6.0
4.0
2.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: August 28, 2010
Page 1
Time: 18:03:14


SiS478DN
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiS478DN_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: August 28, 2010
Page 1
Time: 18:32:39


SiS478DN
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiS478DN_j-c_txt
10
8
6
4
2
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: August 28, 2010
Page 1
Time: 18:41:21