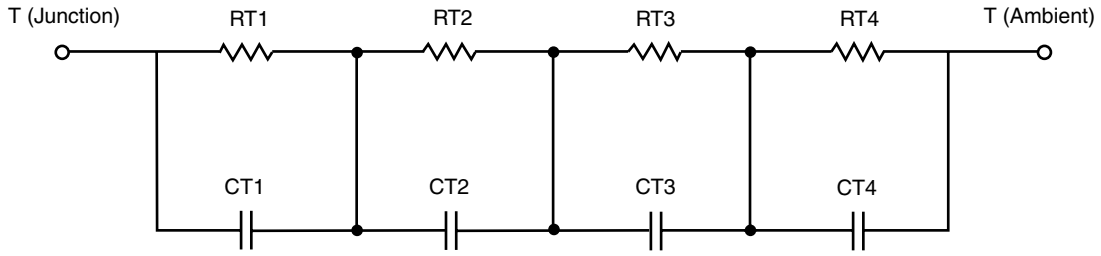
R-C Thermal Model Parameters

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

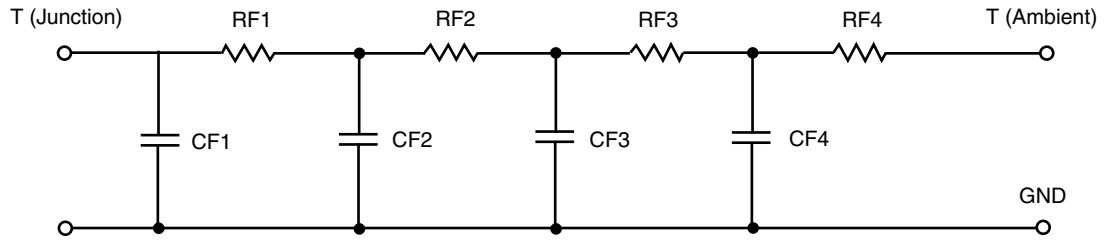


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.0927	1.6545	N/A
RT2	15.3662	5.2990	N/A
RT3	3.9484	761.9556 m	N/A
RT4	50.6971	292.9569 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	28.9041 m	341.6349 u	N/A
CT2	296.1749 m	1.6286 m	N/A
CT3	408.0746 u	80.2439 m	N/A
CT4	1.4748	107.4182 u	N/A

Note
N/A indicates not applicable

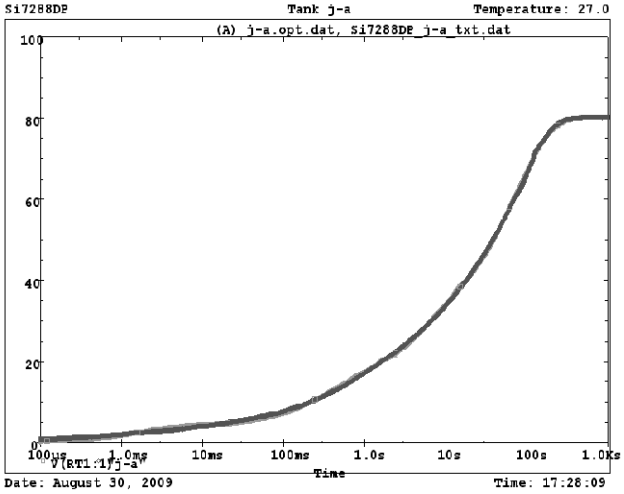
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

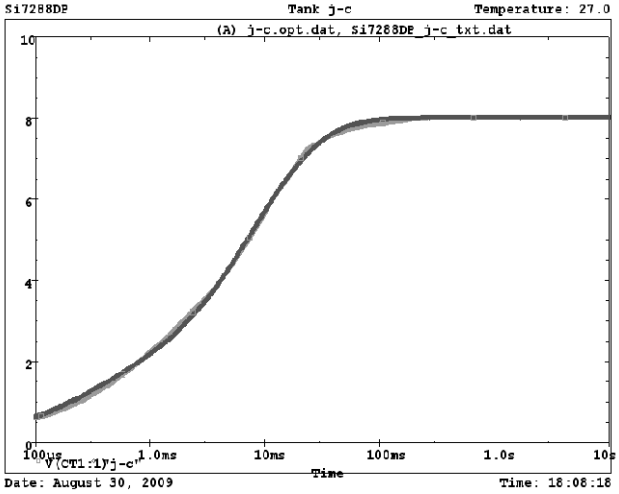
R-C THERMAL MODEL FOR FILTER CONFIGURATION

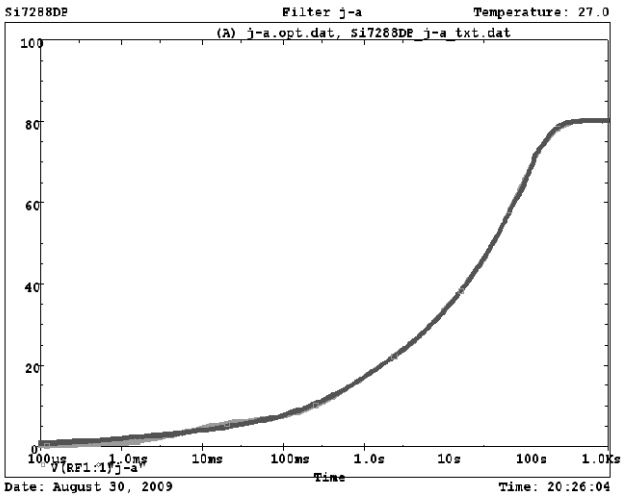


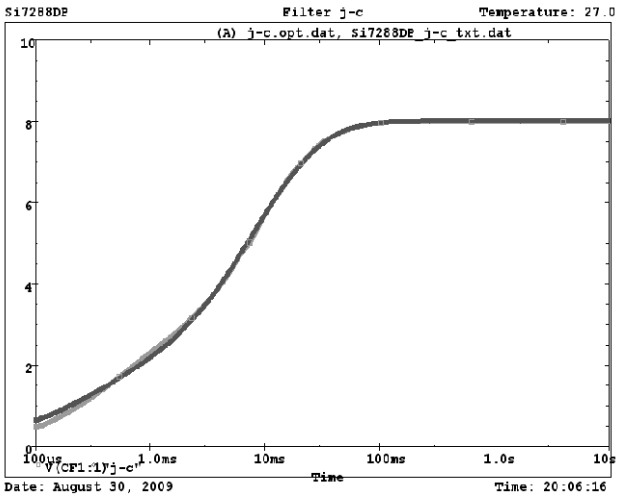
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.7006	2.3400	N/A
RF2	13.7722	2.5825	N/A
RF3	18.6502	2.3767	N/A
RF4	41.9791	695.4440 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0596 m	181.2391 u	N/A
CF2	43.5565 m	1.3767 m	N/A
CF3	310.2284 m	345.7297 u	N/A
CF4	1.4098	34.2991 m	N/A

Note
N/A indicates not applicable


Si7288DP
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, Si7288DP_j-a_txt.dat
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 30, 2009
Time: 17:28:09


Si7288DP
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, Si7288DP_j-c_txt.dat
10
8
6
4
2
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: August 30, 2009
Time: 18:08:18


Si7288DP
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, Si7288DP_j-a_txt.dat
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 30, 2009
Time: 20:26:04


Si7288DP
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, Si7288DP_j-c_txt.dat
10
8
6
4
2
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: August 30, 2009
Time: 20:06:16