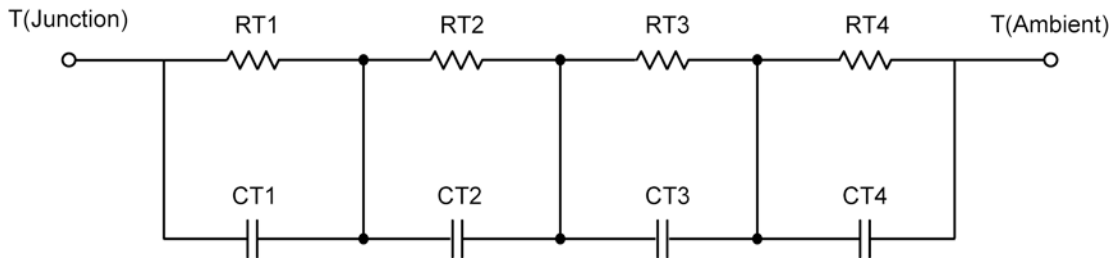
R-C Thermal Model Parameters

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."

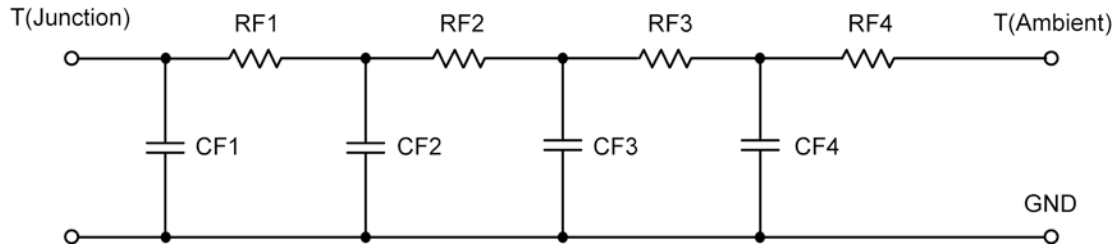
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	15.6312	43.9707 m	N/A
RT2	40.8698	1.2169	N/A
RT3	21.7919	321.0293 m	N/A
RT4	6.7071	1.1181	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	72.2258 m	24.4063 m	N/A
CT2	1.9882	1.2080 m	N/A
CT3	1.3539	2.1222	N/A
CT4	6.7570 m	12.5919 m	N/A

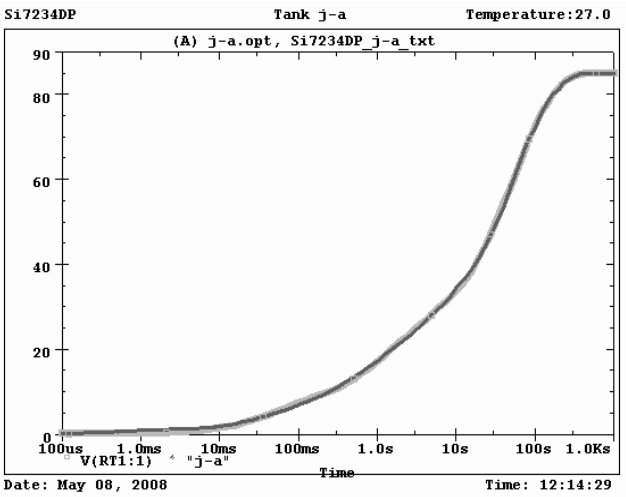
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

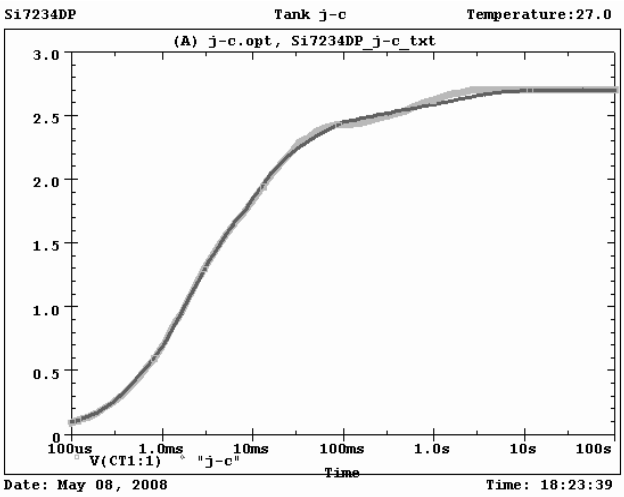
R-C THERMAL MODEL FOR FILTER CONFIGURATION

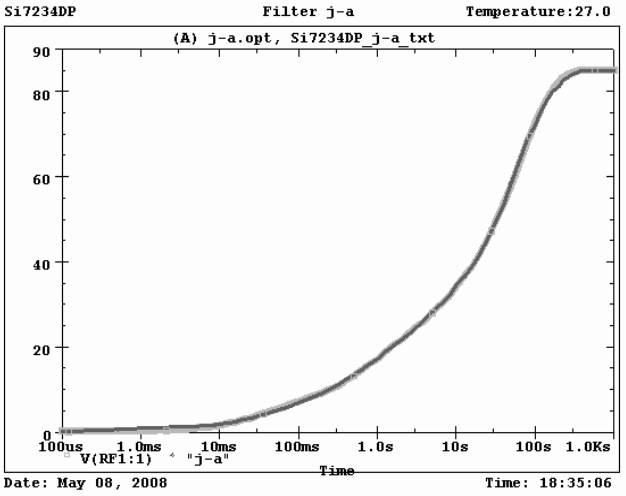


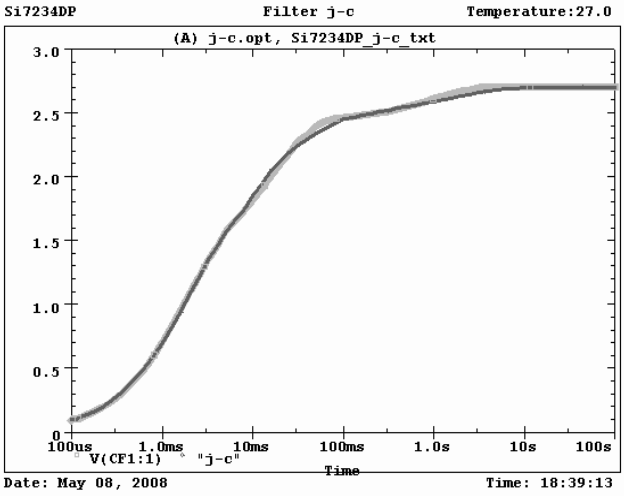
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.1626	1.5045	N/A
RF2	14.4537	123.6809 m	N/A
RF3	15.8360	819.1907 m	N/A
RF4	47.5477	252.6284 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.4167 m	1.0552 m	N/A
CF2	49.2744 m	14.4672 m	N/A
CF3	358.5101 m	2.9659 m	N/A
CF4	902.0871 m	3.5436	N/A

Note
NA indicates not applicable


Si7234DP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7234DP_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: May 08, 2008
Time: 12:14:29


Si7234DP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7234DP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-c"
Time
Date: May 08, 2008
Time: 18:23:39


Si7234DP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7234DP_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: May 08, 2008
Time: 18:35:06


Si7234DP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7234DP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-c"
Time
Date: May 08, 2008
Time: 18:39:13