R-C Thermal Model Parameters

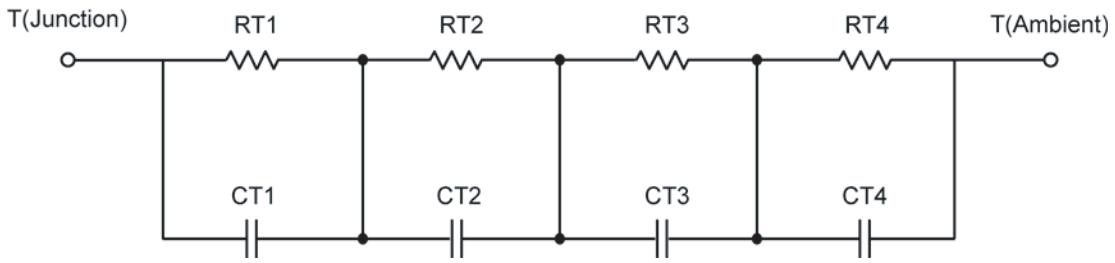
DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "A Simple Method of Generating Thermal Models for a Power MOSFET"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

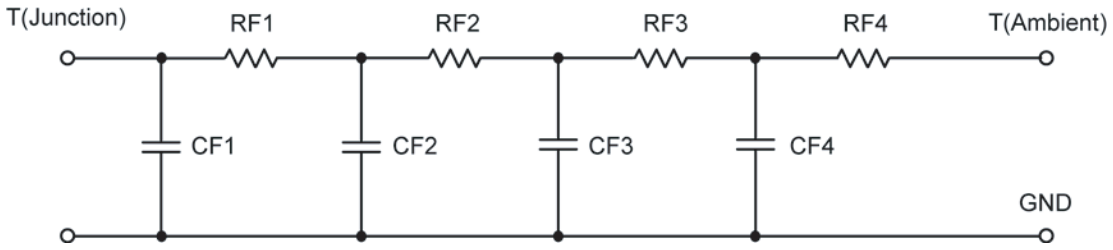
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.0177	31.7011 m	N/A
RT2	9.8110	369.0422 m	N/A
RT3	5.3482	1.2338	N/A
RT4	42.4788	560.1538 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	172.8286 m	1.4806 m	N/A
CT2	1.3368	3.9197 m	N/A
CT3	17.0410 m	32.4252 m	N/A
CT4	1.9908	59.3005 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

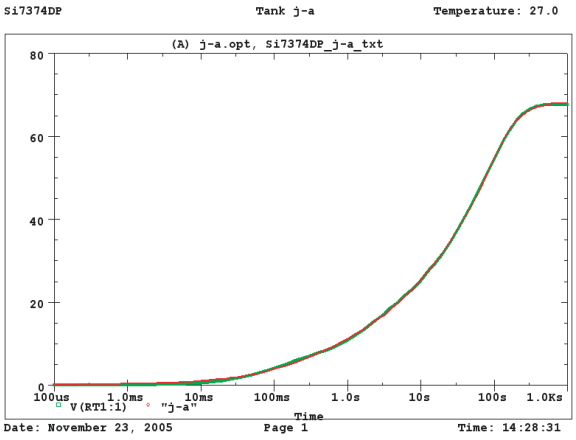


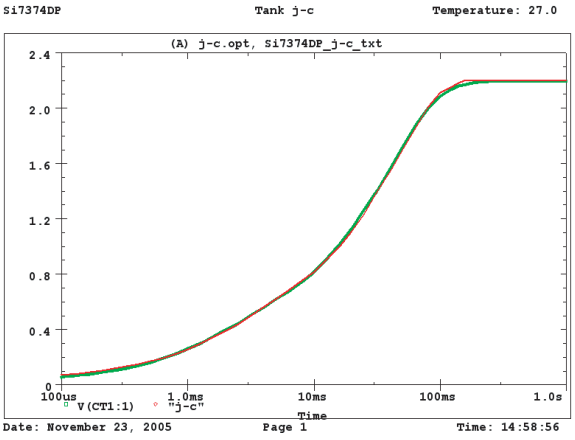
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.8432	5.0406 m	N/A
RF2	11.7098	534.1573 m	N/A
RF3	15.1342	1.2925	N/A
RF4	36.8529	374.2277 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	7.7264 m	1.1252 m	N/A
CF2	75.0873 m	1.6646 m	N/A
CF3	441.5888 m	20.3311 m	N/A
CF4	1.5525	1.2171 m	N/A

Note: NA indicates not applicable

Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002


Si7374DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si7374DP_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: November 23, 2005
Page 1
Time: 14:28:31


Si7374DP
Tank j-c
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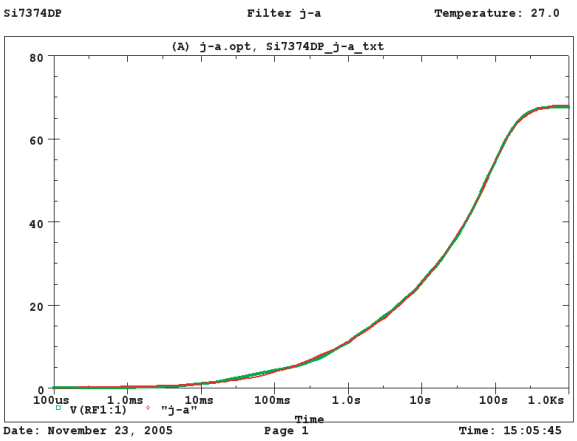
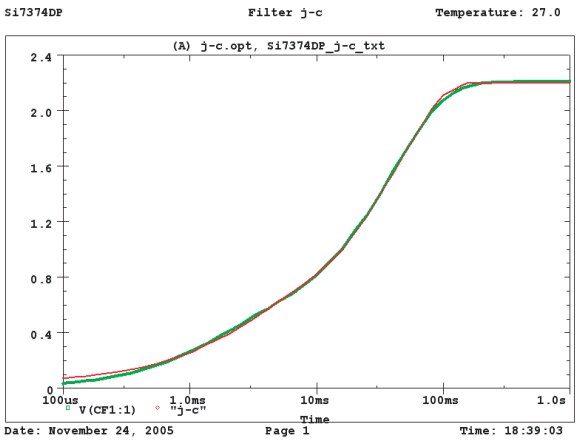
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: November 23, 2005
Page 1
Time: 14:58:56


Si7374DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si7374DP_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: November 23, 2005
Page 1
Time: 15:05:45


Si7374DP
Filter j-c
Temperature: 27.0
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2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: November 24, 2005
Page 1
Time: 18:39:03