R-C Thermal Model Parameters

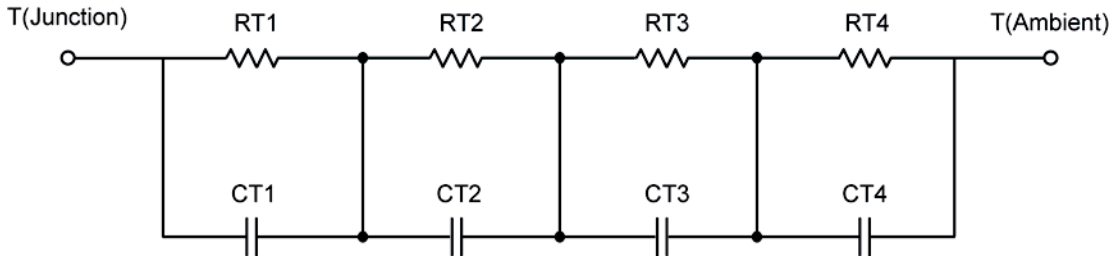
DESCRIPTION

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.

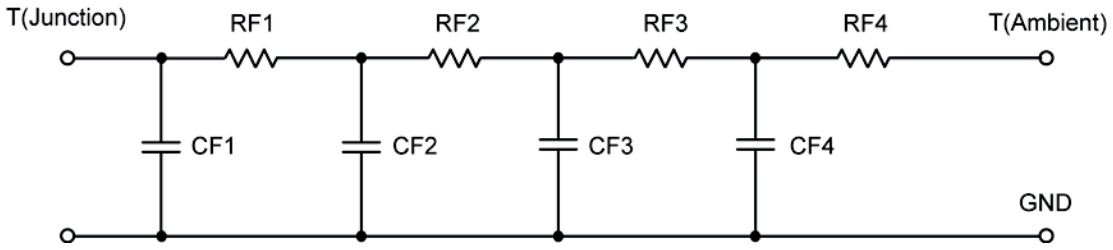
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.9269	469.8537 m	N/A
RT2	1.8924	248.1578 m	N/A
RT3	11.4965	477.8885 m	N/A
RT4	43.6842	1.4041	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	44.8621 m	3.9031 m	N/A
CT2	5.3879 m	2.0052 m	N/A
CT3	345.5097 m	33.4696 m	N/A
CT4	1.8077	11.0664 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

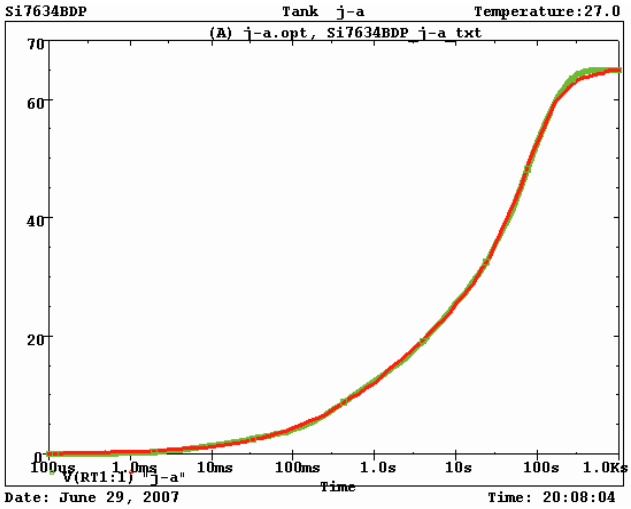


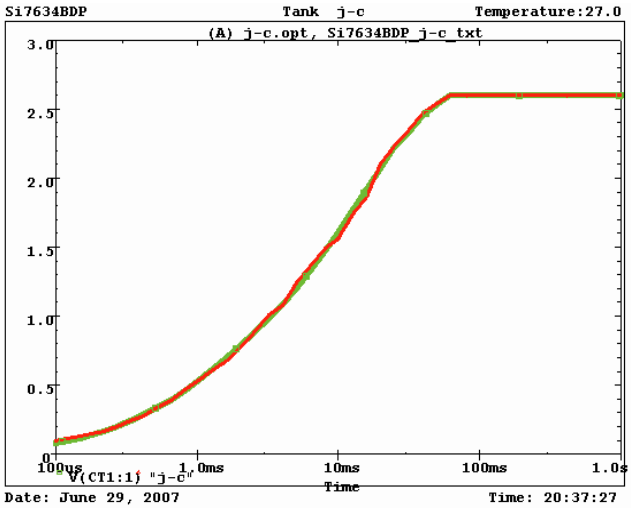
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.0515	792.5640 m	N/A
RF2	9.4023	767.0347 m	N/A
RF3	14.3801	927.8400 m	N/A
RF4	37.1661	112.5613 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	7.9672 m	1.2344 m	N/A
CF2	47.7128 m	4.3773 m	N/A
CF3	344.9576 m	6.4272 m	N/A
CF4	1.7342	61.0347 m	N/A

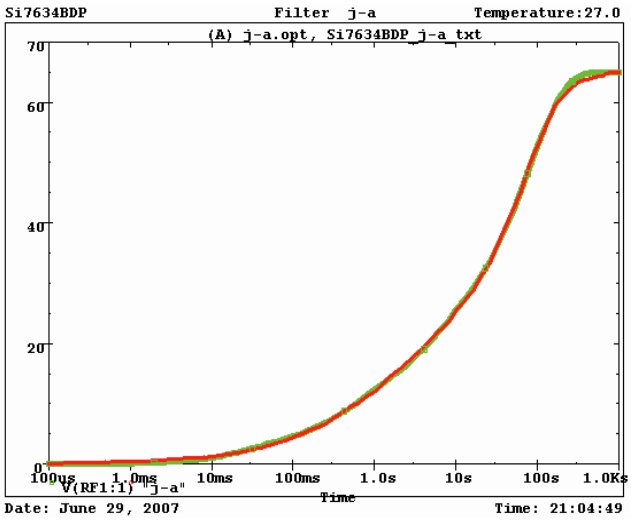
Note: NA indicates not applicable

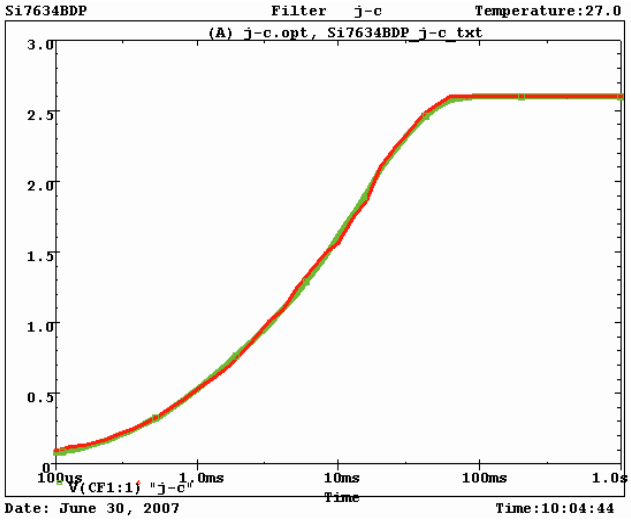
Reference:

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


Si7634BDP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7634BDP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: June 29, 2007
Time: 20:08:04


Si7634BDP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7634BDP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1) "j-c"
Time
Date: June 29, 2007
Time: 20:37:27


Si7634BDP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7634BDP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: June 29, 2007
Time: 21:04:49


Si7634BDP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7634BDP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1) "j-c"
Time
Date: June 30, 2007
Time:10:04:44