R-C Thermal Model Parameters

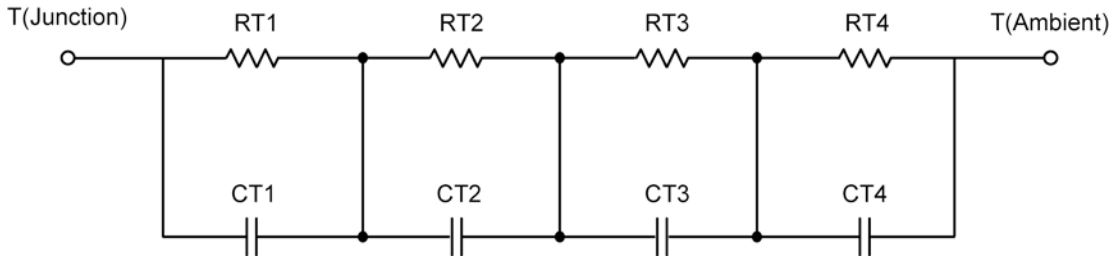
DESCRIPTION

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.

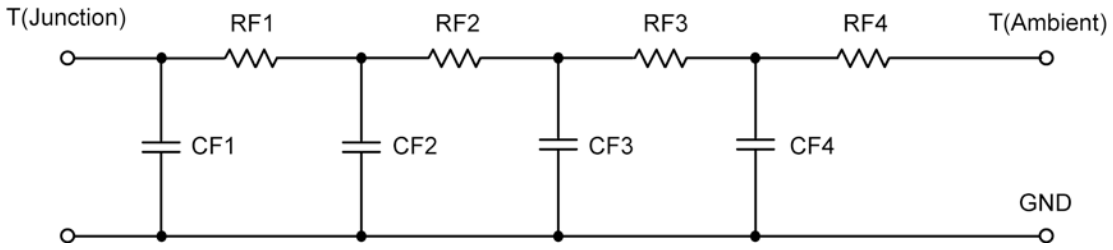
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	1.8303	1.6265	N/A
RT2	12.6034	5.3085	N/A
RT3	16.0846	595.9000 m	N/A
RT4	50.4817	2.4691	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	350.7575 u	10.1757 m	N/A
CT2	9.1612 m	2.4412 m	N/A
CT3	112.4963 m	140.9460 m	N/A
CT4	1.3838	256.2536 u	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

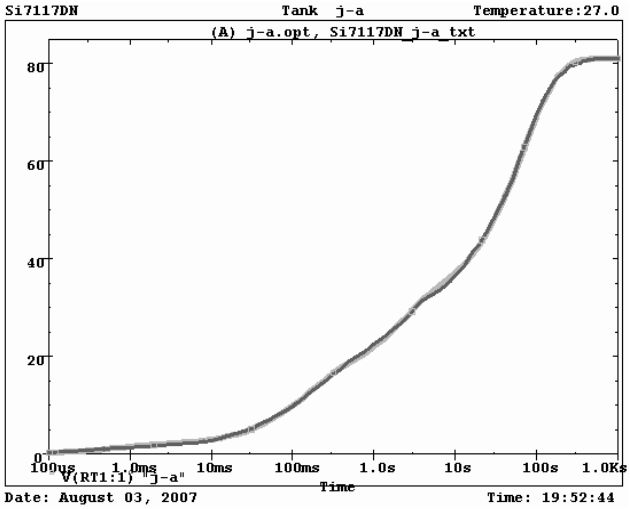


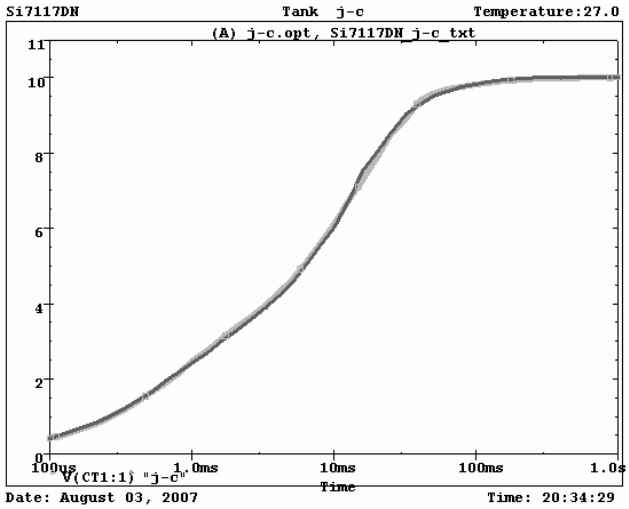
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.3897	3.2051	N/A
RF2	14.1256	5.5968	N/A
RF3	15.0952	731.1845 m	N/A
RF4	48.3895	466.9155 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.2550 m	235.3452 u	N/A
CF2	9.1869 m	1.9043 m	N/A
CF3	107.7674 m	224.4059 u	N/A
CF4	1.2668	121.1269 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


Si7117DN
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7117DN_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: August 03, 2007
Time: 19:52:44


Si7117DN
Tank j-c
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10
8
6
4
2
0
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10ms
100ms
1.0s
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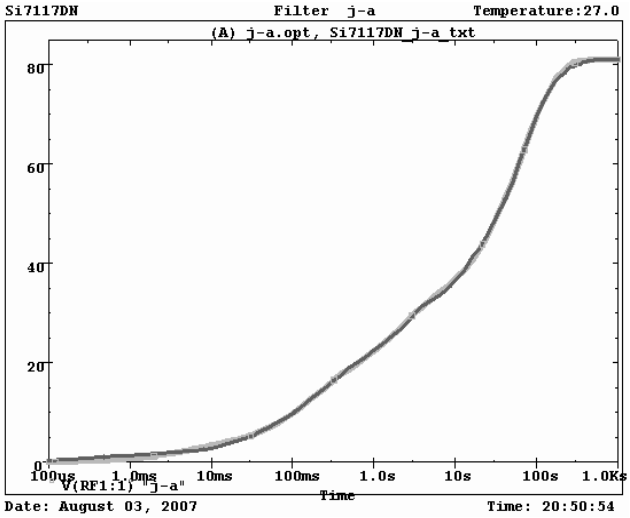
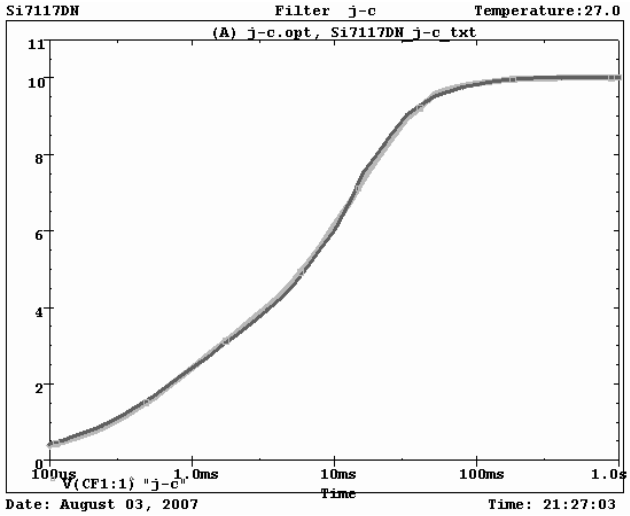
Time
Date: August 03, 2007
Time: 20:34:29


Si7117DN
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7117DN_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: August 03, 2007
Time: 20:50:54


Si7117DN
Filter j-c
Temperature:27.0
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11
10
8
6
4
2
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1) "j-c"
Time
Date: August 03, 2007
Time: 21:27:03