R-C Thermal Model Parameters

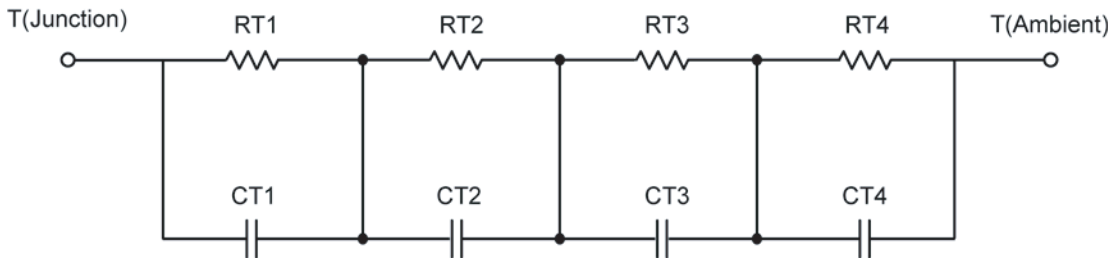
DESCRIPTION

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.

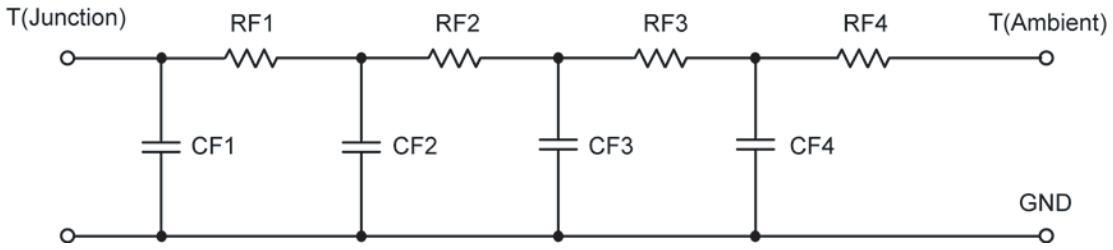
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	7.1986	N/A	8.5742
RT2	24.9213	N/A	3.4749
RT3	25.4991	N/A	9.3803
RT4	52.0124	N/A	14.5718
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	390.3464 u	N/A	11.3811 m
CT2	4.1885 m	N/A	2.5353 m
CT3	33.8390 m	N/A	219.3568 m
CT4	1.4069	N/A	28.4424 m

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

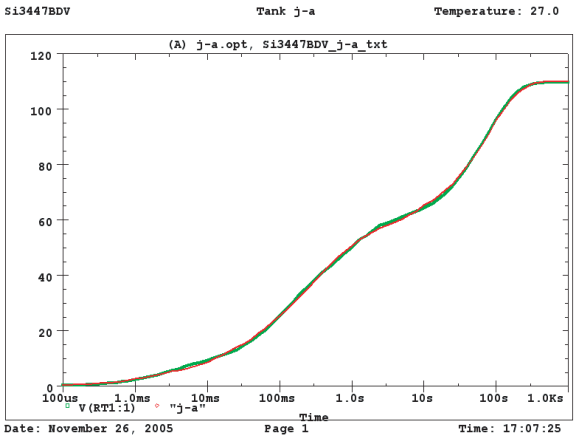


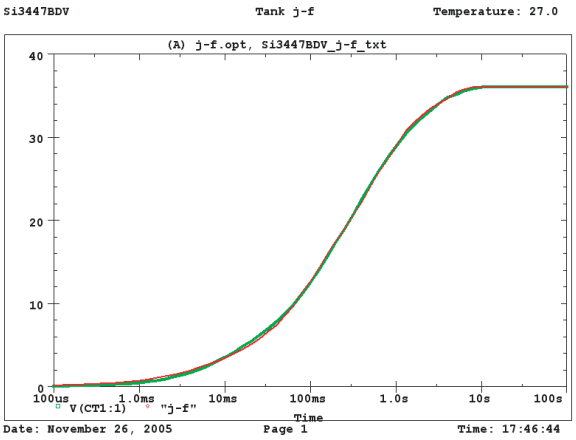
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.3331	N/A	4.8884
RF2	26.7812	N/A	12.2204
RF3	22.7029	N/A	14.9583
RF4	50.7474	N/A	3.9756
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	415.8420 u	N/A	2.0186 m
CF2	3.2741 m	N/A	4.5127 m
CF3	29.9366 m	N/A	27.5978 m
CF4	1.4147	N/A	666.2334 m

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


Si3447BDV
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si3447BDV_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: November 26, 2005
Page 1
Time: 17:07:25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20
10
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100us
1.0ms
10ms
100ms
1.0s
10s
100s
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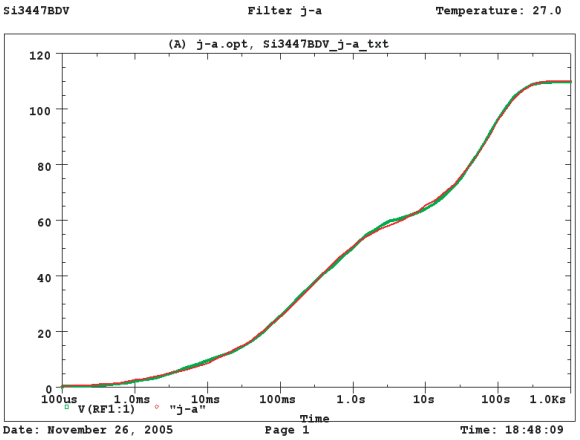
Page 1
Time: 17:46:44


Si3447BDV
Filter j-a
Temperature: 27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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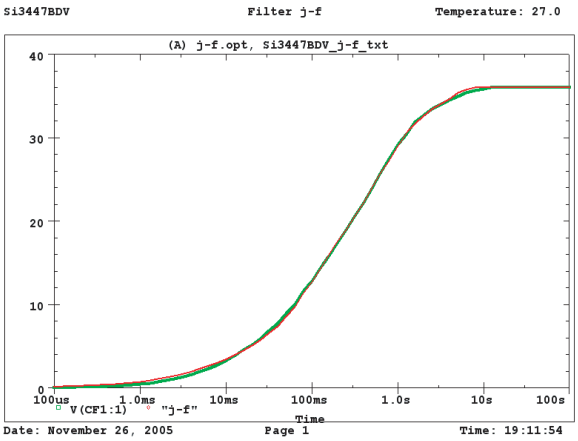
"j-a"
Time
Date: November 26, 2005
Page 1
Time: 18:48:09


Si3447BDV
Filter j-f
Temperature: 27.0
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: November 26, 2005
Page 1
Time: 19:11:54