R-C Thermal Model Parameters

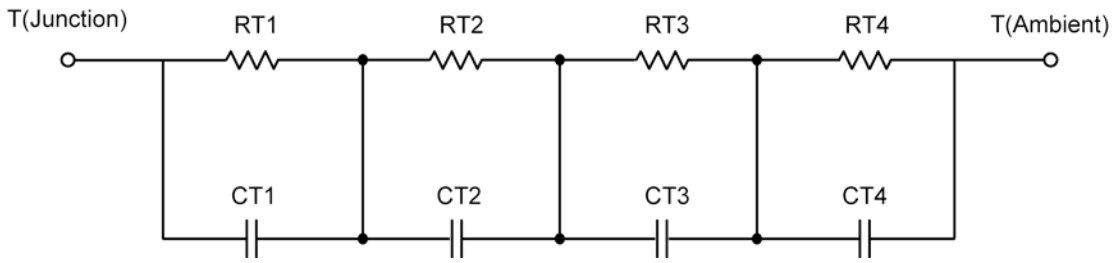
DESCRIPTION

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.

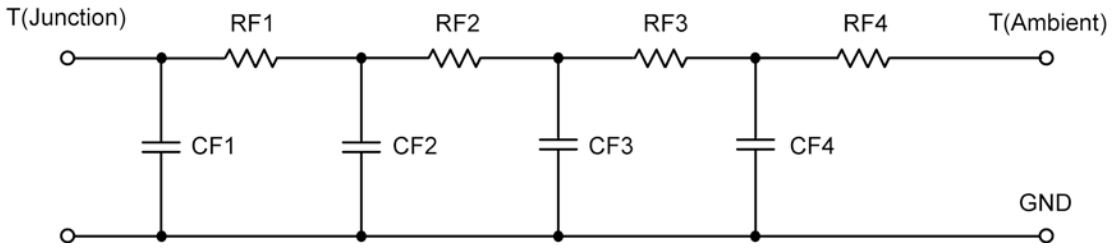
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.2698	N/A	7.5124
RT2	32.1014	N/A	6.2331
RT3	18.2159	N/A	15.1701
RT4	49.4129	N/A	9.0844
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	214.6398 u	N/A	11.0242 m
CT2	3.8620 m	N/A	153.3919 u
CT3	105.7563 m	N/A	1.1849 m
CT4	1.6050	N/A	13.5787 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

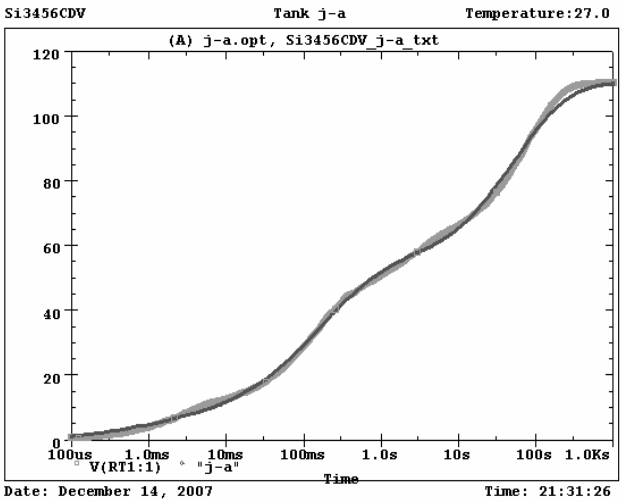


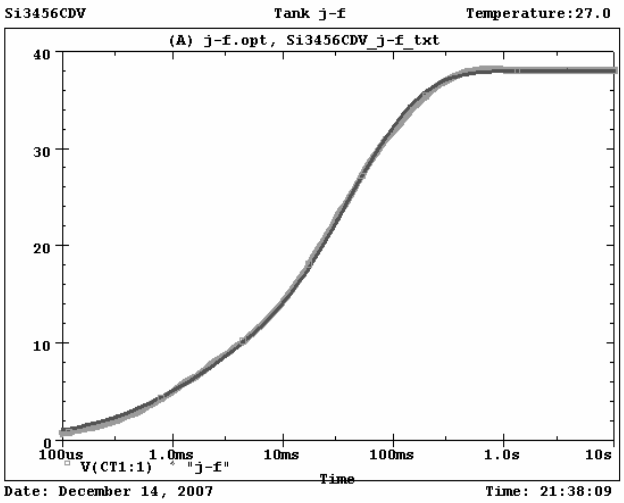
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.6801	N/A	8.6355
RF2	31.8644	N/A	18.9290
RF3	18.5606	N/A	9.0152
RF4	49.8949	N/A	1.4203
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	160.7755 u	N/A	136.1155 u
CF2	2.9127 m	N/A	1.0726 m
CF3	55.8395 m	N/A	5.8469 m
CF4	1.4156	N/A	454.8802 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


Si3456CDV
Tank j-a
Temperature:27.0
(A) j-a.opt, Si3456CDV_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: December 14, 2007
Time: 21:31:26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Tank j-f
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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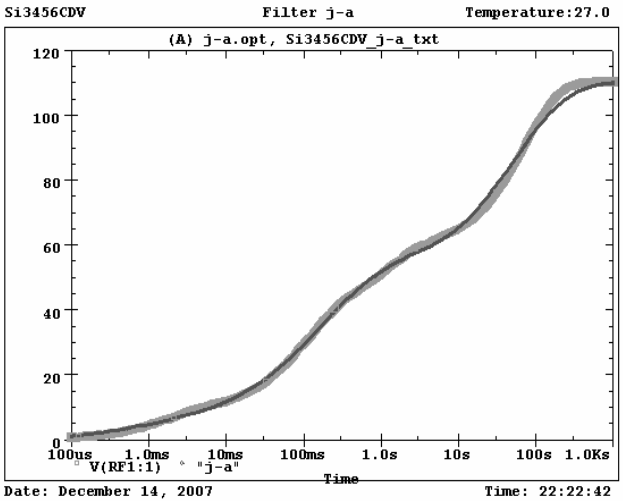
Si3456CDV
Filter j-a
Temperature:27.0
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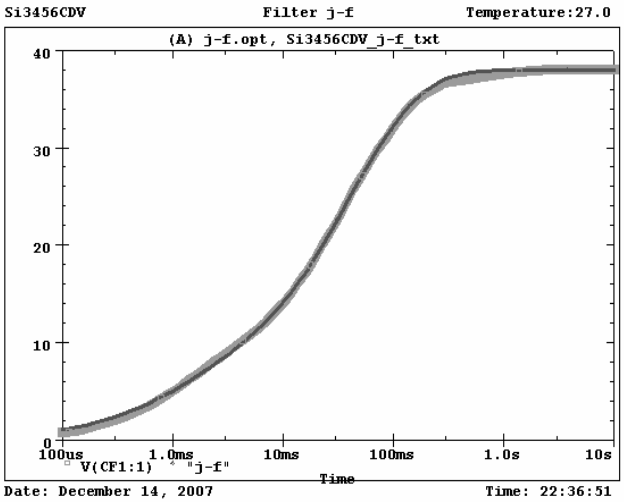
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: December 14, 2007
Time: 22:22:42


Si3456CDV
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date: December 14, 2007
Time: 22:36:51