R-C Thermal Model Parameters

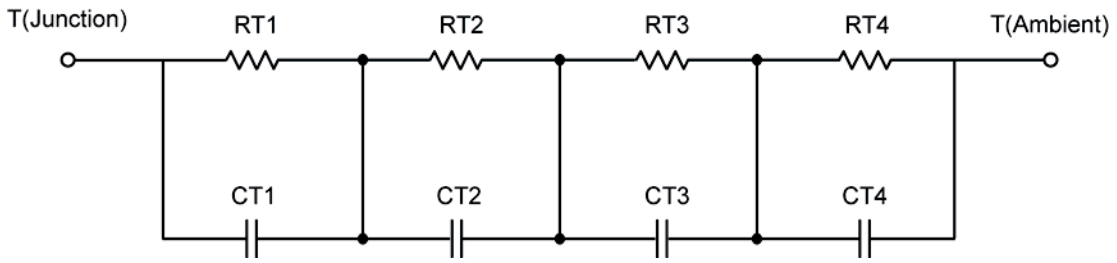
DESCRIPTION

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.

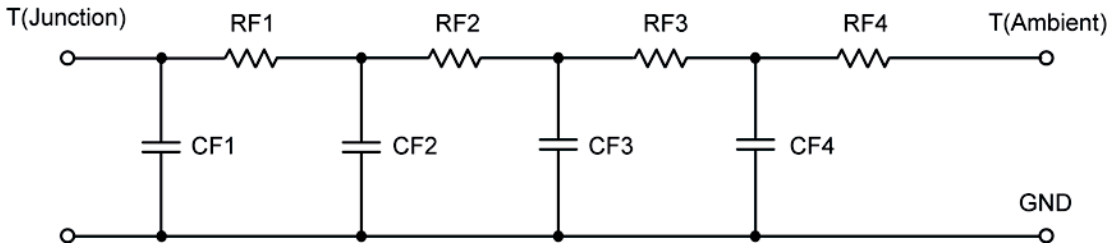
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	16.0860	N/A	6.2479
RT2	12.6984	N/A	5.4874
RT3	16.6148	N/A	3.1152
RT4	54.6008	N/A	10.1495
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	121.6116 m	N/A	13.1130 m
CT2	831.4965 u	N/A	742.4435 u
CT3	11.8045 m	N/A	244.5466 m
CT4	1.4599	N/A	2.6459 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

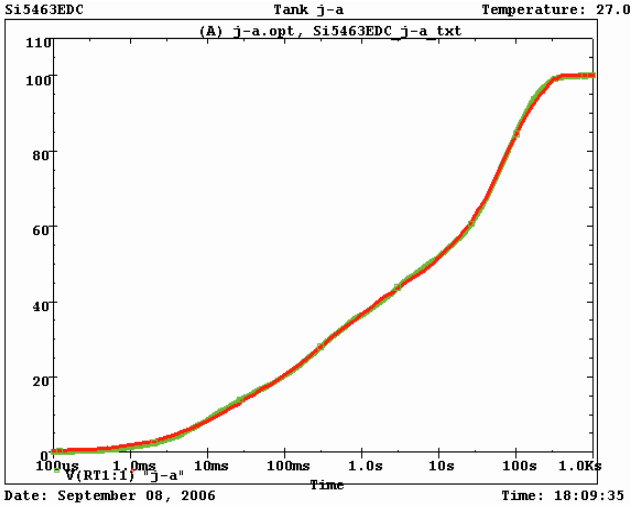


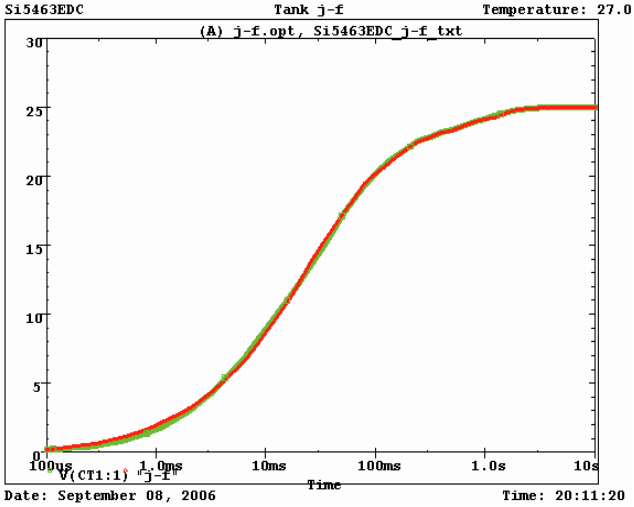
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	11.7135	N/A	5.2679
RF2	19.3968	N/A	13.3387
RF3	16.9799	N/A	5.0553
RF4	51.9097	N/A	1.3380
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	624.4938 u	N/A	414.4321 u
CF2	7.0377 m	N/A	1.1607 m
CF3	103.2634 m	N/A	25.9795 m
CF4	1.4252	N/A	1.2239

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


Si5463EDC
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si5463EDC_j-a_txt
110
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: September 08, 2006
Time: 18:09:35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Tank j-f
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25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
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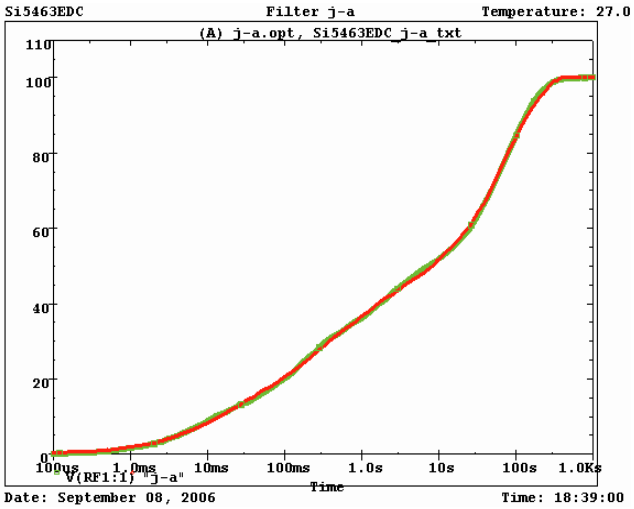
Si5463EDC
Filter j-a
Temperature: 27.0
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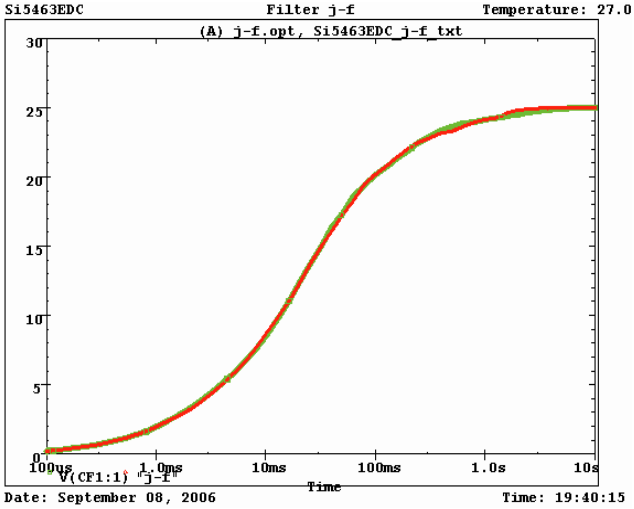
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: September 08, 2006
Time: 18:39:00


Si5463EDC
Filter j-f
Temperature: 27.0
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30
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: September 08, 2006
Time: 19:40:15