R-C Thermal Model Parameters

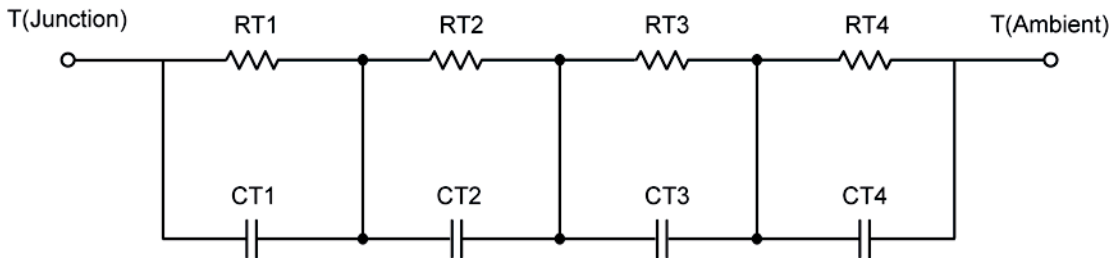
DESCRIPTION

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.

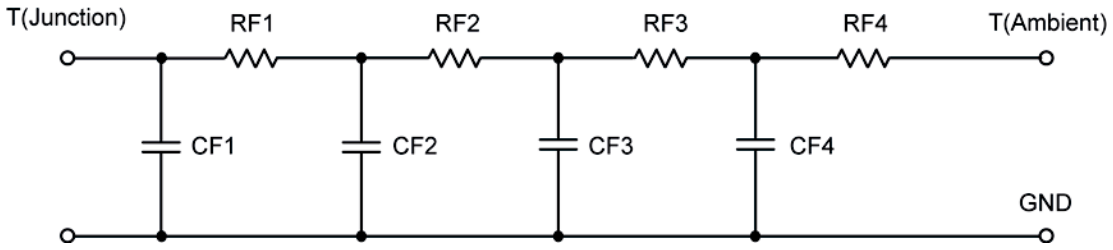
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	20.6250	N/A	13.6225
RT2	6.2930	N/A	3.0939
RT3	29.2501	N/A	12.7060
RT4	53.6570	N/A	10.5264
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.7167 m	N/A	5.6012 m
CT2	2.5757 m	N/A	1.3967 m
CT3	57.2963 m	N/A	22.5183 m
CT4	1.2867	N/A	212.8355 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

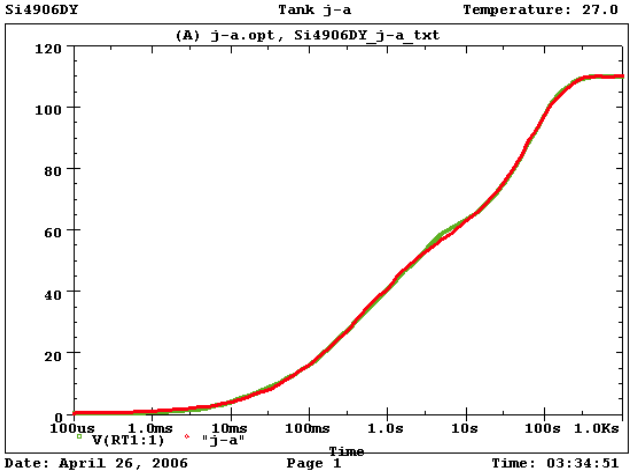


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.0054	N/A	5.9396
RF2	24.6058	N/A	21.4482
RF3	27.3784	N/A	8.8176
RF4	51.4472	N/A	3.8525
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.4255 m	N/A	1.2186 m
CF2	4.9328 m	N/A	4.1815 m
CF3	48.3234 m	N/A	85.7405 m
CF4	1.2499	N/A	743.8693 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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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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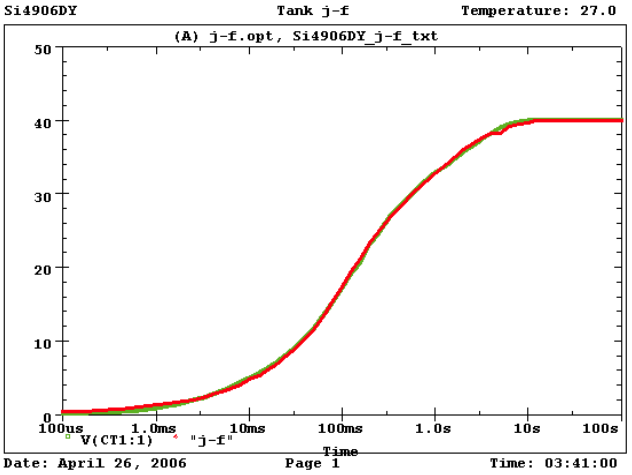
"j-a"
Time
Date: April 26, 2006
Page 1
Time: 03:34:51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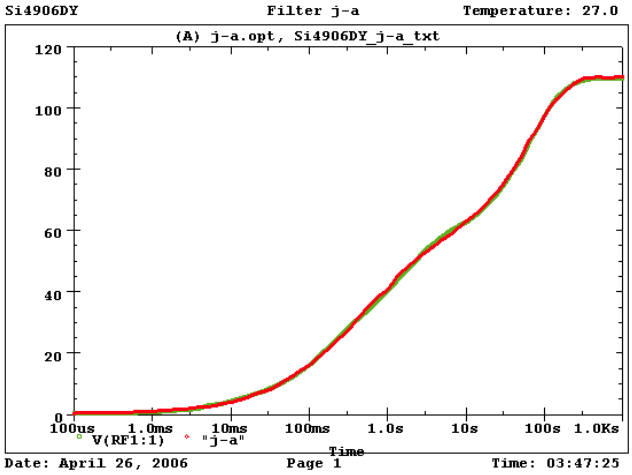
Page 1
Time: 03:41:00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Filter j-a
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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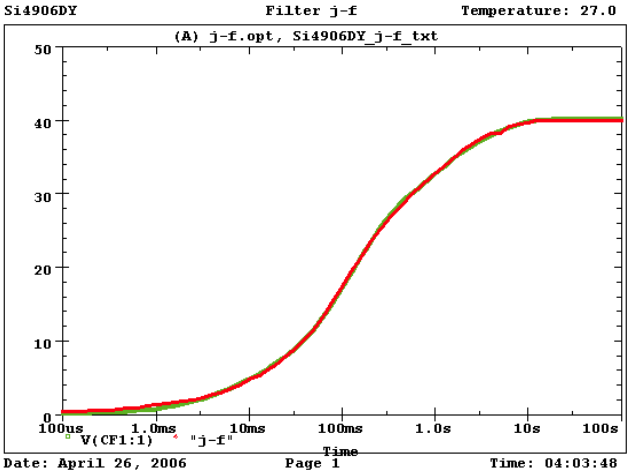
Time
Date: April 26, 2006
Page 1
Time: 03:47:25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Filter j-f
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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: April 26, 2006
Page 1
Time: 04:03:48