R-C Thermal Model Parameters

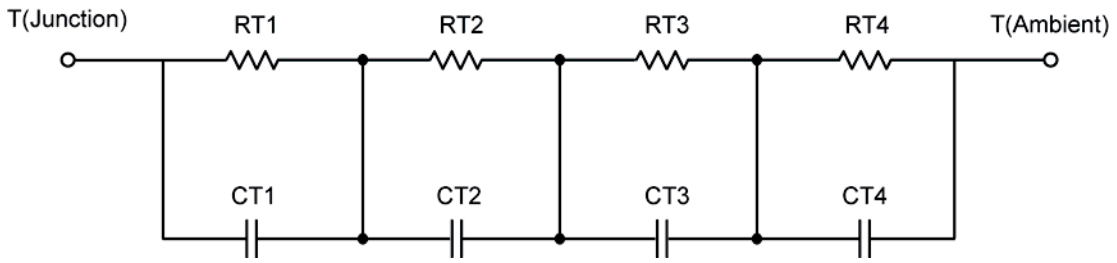
DESCRIPTION

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.

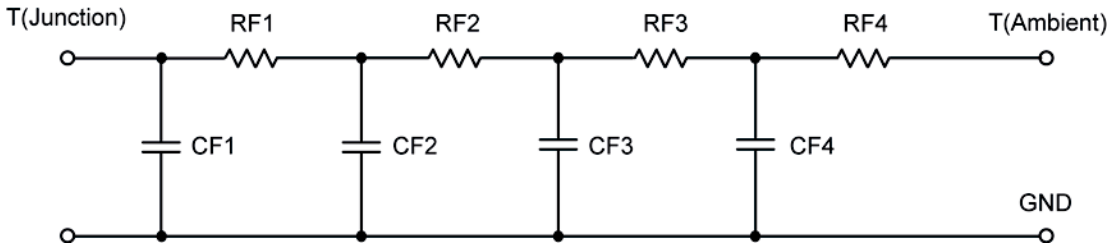
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.4389	N/A	6.3593
RT2	5.1108	N/A	944.9503 m
RT3	16.7765	N/A	3.3405
RT4	48.9638	N/A	10.3749
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	61.3750 m	N/A	15.0791 m
CT2	11.7026 m	N/A	6.7469 m
CT3	171.8818 m	N/A	877.7676 m
CT4	1.6999	N/A	87.9996 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

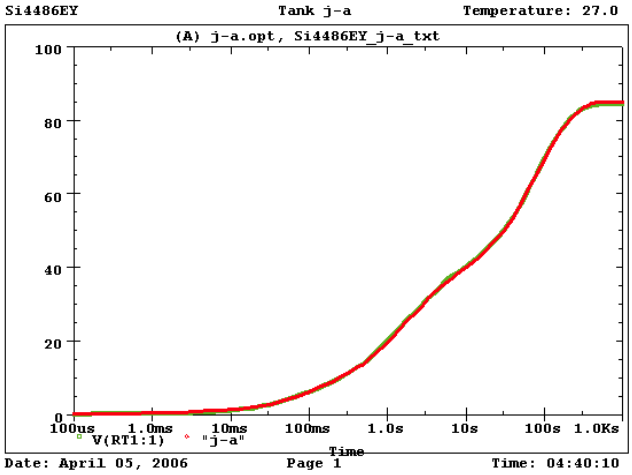


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.2845	N/A	1.8210
RF2	19.2687	N/A	8.9210
RF3	14.1189	N/A	8.2987
RF4	43.8469	N/A	1.9465
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	9.0889 m	N/A	3.5399 m
CF2	32.1476 m	N/A	12.0117 m
CF3	260.5862 m	N/A	100.2378 m
CF4	1.5615	N/A	471.6705 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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Tank j-a
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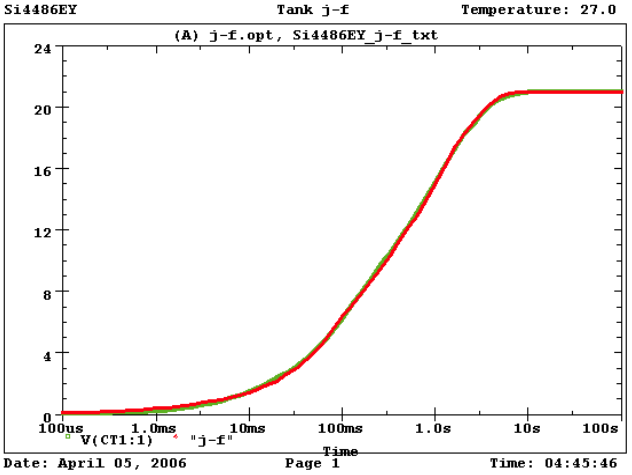
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: April 05, 2006
Page 1
Time: 04:40:10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100ms
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10s
100s
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Time
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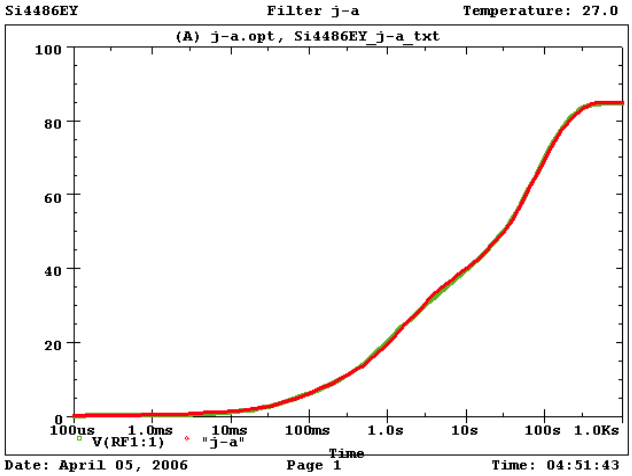
Page 1
Time: 04:45:46


Si4486EY
Filter j-a
Temperature: 27.0
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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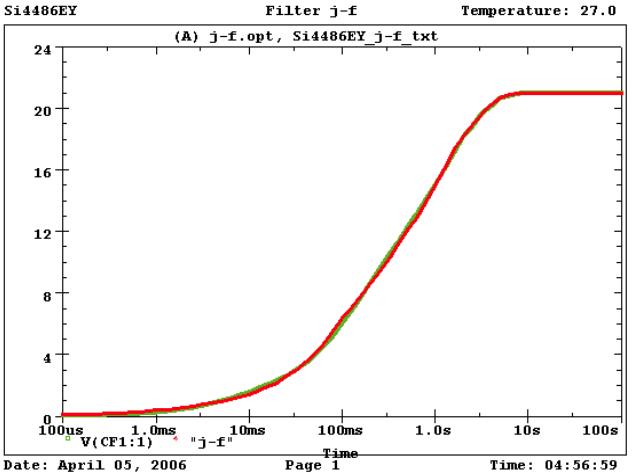
Time
Date: April 05, 2006
Page 1
Time: 04:51:43


Si4486EY
Filter j-f
Temperature: 27.0
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24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: April 05, 2006
Page 1
Time: 04:56:59