R-C Thermal Model Parameters

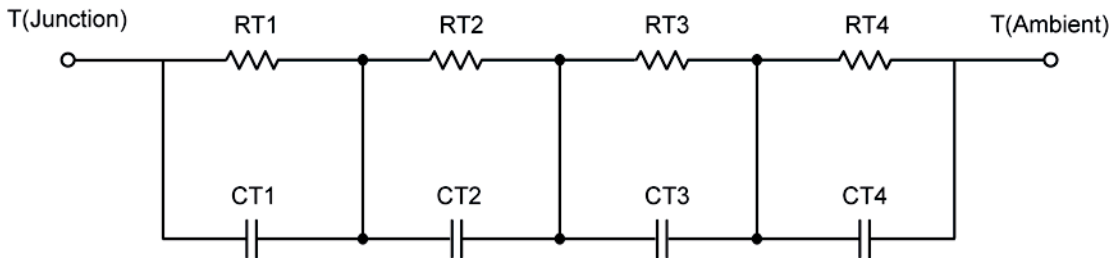
DESCRIPTION

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.

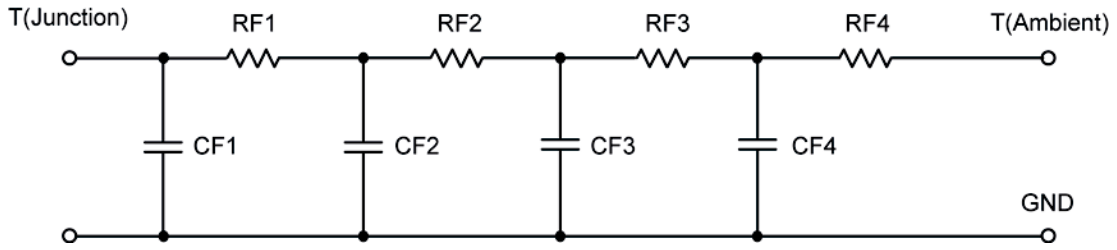
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.8700	N/A	8.0367
RT2	5.7169	N/A	2.9860
RT3	20.0537	N/A	2.4581
RT4	48.1958	N/A	10.5020
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	27.3588 m	N/A	6.8201 m
CT2	900.4492 u	N/A	433.1994 u
CT3	78.4403 m	N/A	826.5398 m
CT4	1.3102	N/A	96.4489 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

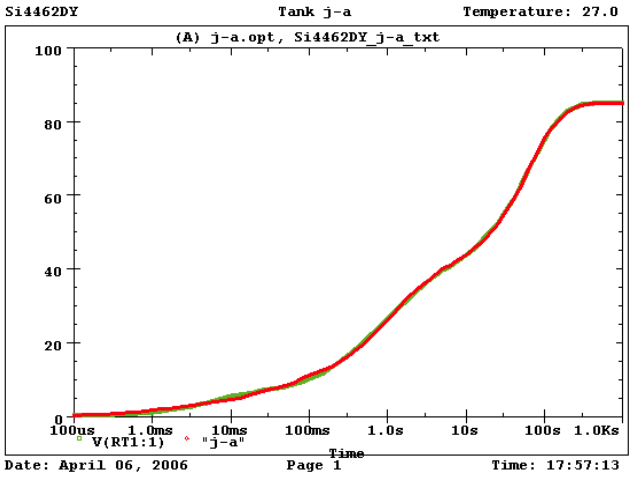


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.9201	N/A	3.1653
RF2	17.8306	N/A	8.5330
RF3	14.4157	N/A	7.2287
RF4	45.6863	N/A	5.2115
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0579 m	N/A	438.9922 u
CF2	21.5519 m	N/A	5.2558 m
CF3	69.1715 m	N/A	60.9340 m
CF4	1.2890	N/A	159.5875 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
Temperature: 27.0
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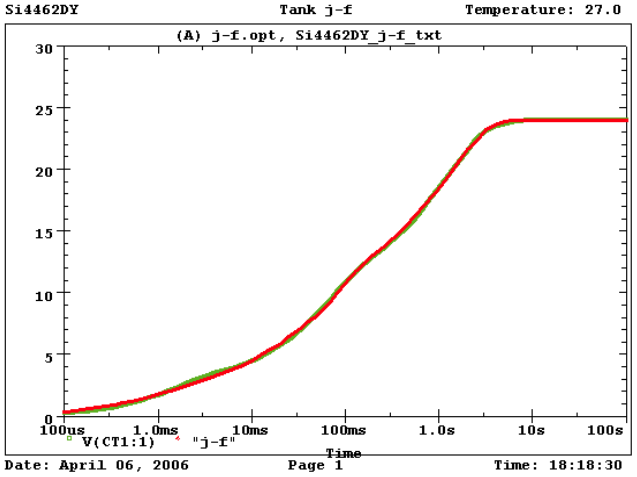
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: April 06, 2006
Page 1
Time: 17:57:13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15
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5
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1.0ms
10ms
100ms
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10s
100s
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Time
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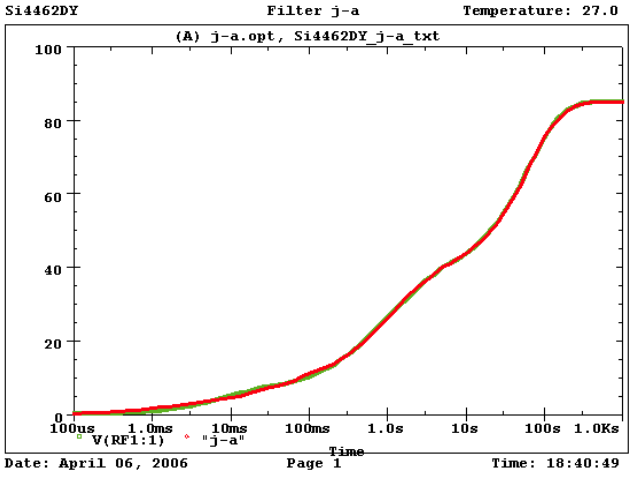
Page 1
Time: 18:18:30


Si4462DY
Filter j-a
Temperature: 27.0
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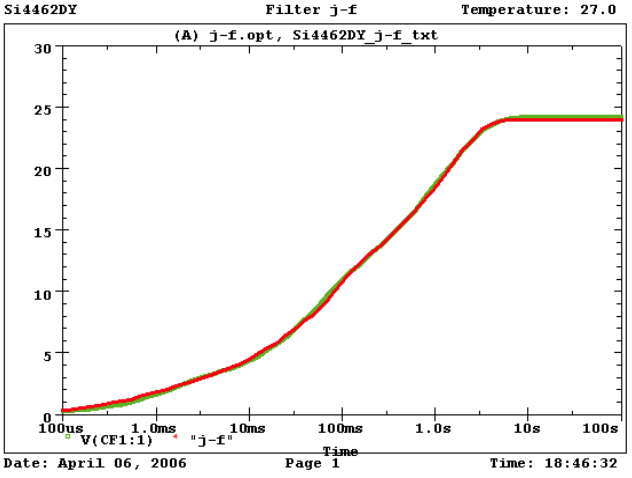
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: April 06, 2006
Page 1
Time: 18:40:49


Si4462DY
Filter j-f
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25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: April 06, 2006
Page 1
Time: 18:46:32