R-C Thermal Model Parameters

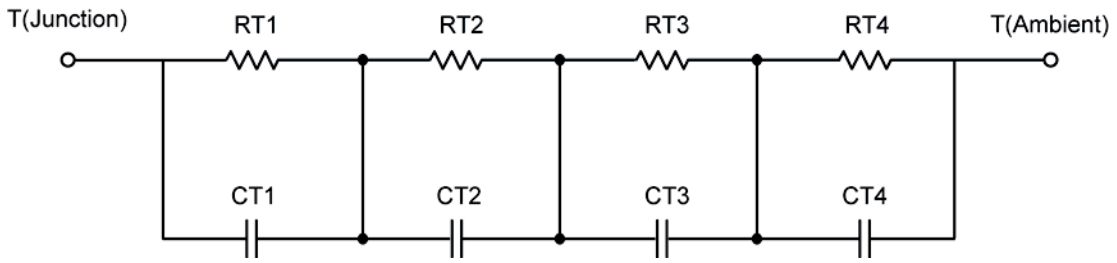
DESCRIPTION

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.

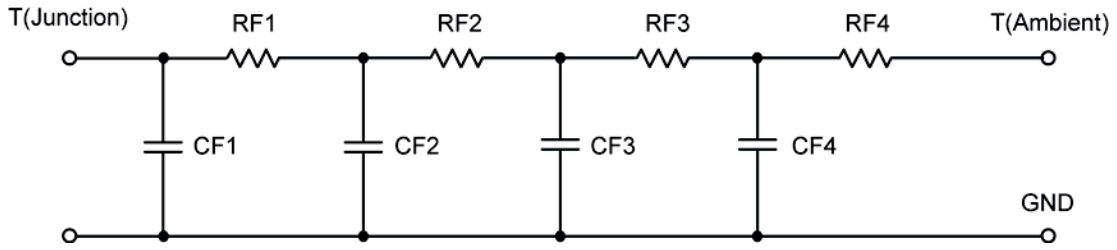
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	20.4296	N/A	5.0806
RT2	25.4182	N/A	1.4103
RT3	5.5776	N/A	3.5572
RT4	25.5405	N/A	5.9561
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	64.5972 m	N/A	119.9260 m
CT2	2.4971	N/A	106.5321 m
CT3	26.8398 m	N/A	13.9221 m
CT4	3.3254	N/A	339.1358 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

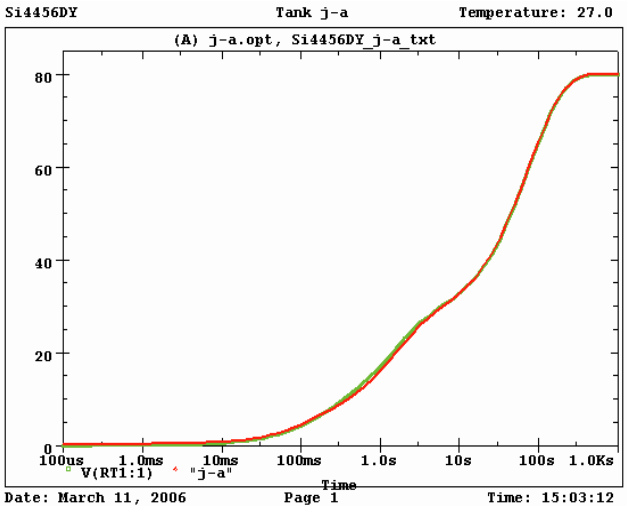


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.7454	N/A	4.7871
RF2	17.8906	N/A	3.9192
RF3	28.3863	N/A	6.5521
RF4	26.3273	N/A	755.2501 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	16.7691 m	N/A	10.3395 m
CF2	43.2305 m	N/A	32.2002 m
CF3	937.8379 m	N/A	127.3779 m
CF4	1.8165	N/A	3.8073

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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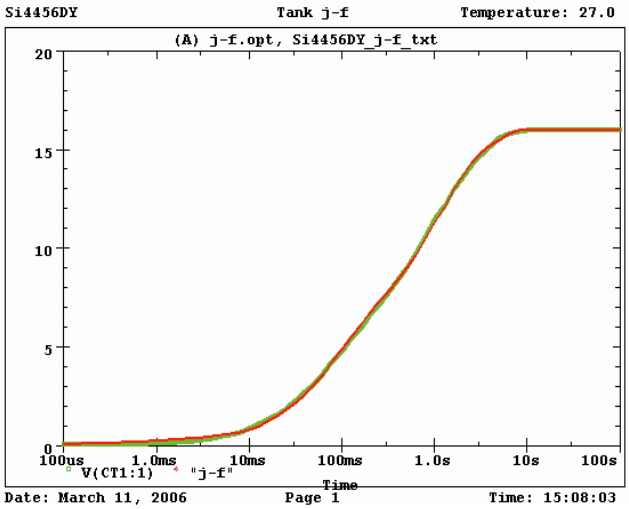
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 11, 2006
Page 1
Time: 15:03:12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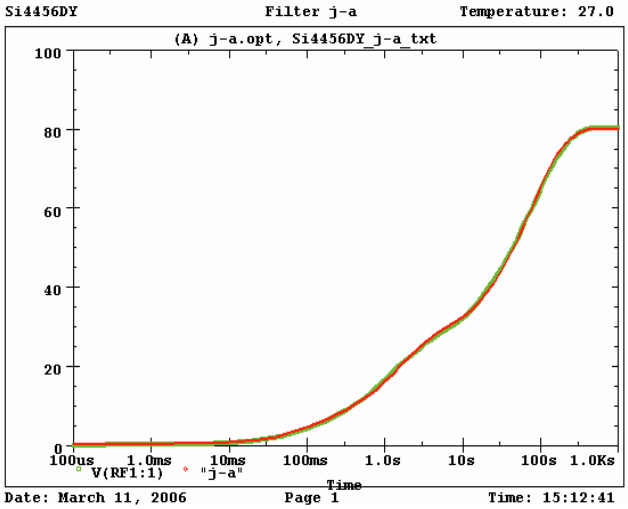
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Filter j-a
Temperature: 27.0
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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"j-a"
Time
Date: March 11, 2006
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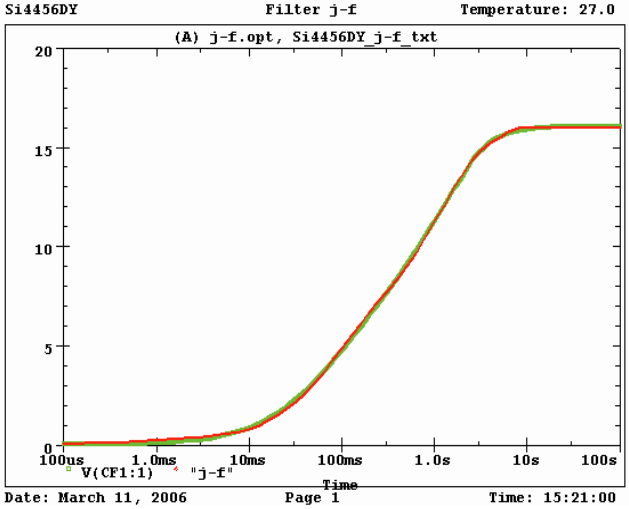
Time: 15:12:41


Si4456DY
Filter j-f
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15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: March 11, 2006
Page 1
Time: 15:21:00