R-C Thermal Model Parameters

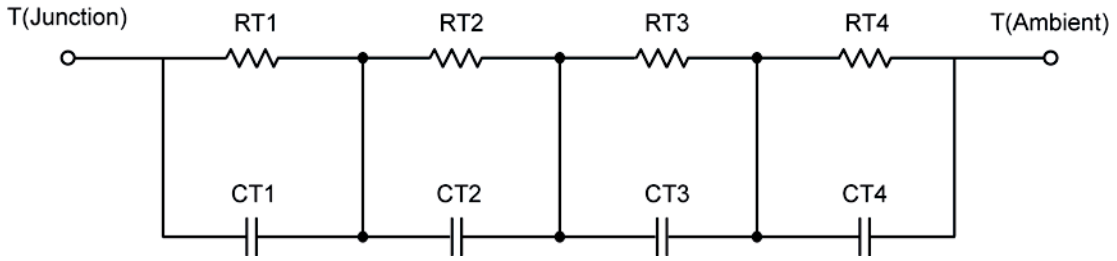
DESCRIPTION

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.

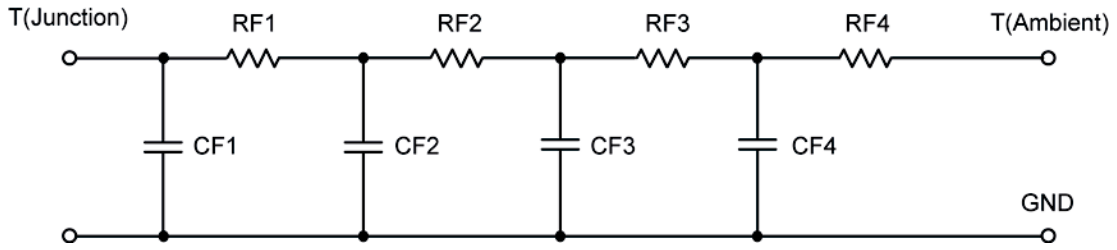
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.6367	N/A	25.1318
RT2	67.5708	N/A	3.6441
RT3	41.9241	N/A	15.5123
RT4	46.8684	N/A	5.7118
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	585.8461 u	N/A	29.1651 m
CT2	1.4689	N/A	131.1414 u
CT3	3.1294 m	N/A	6.7669 m
CT4	19.0572 m	N/A	6.6485 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

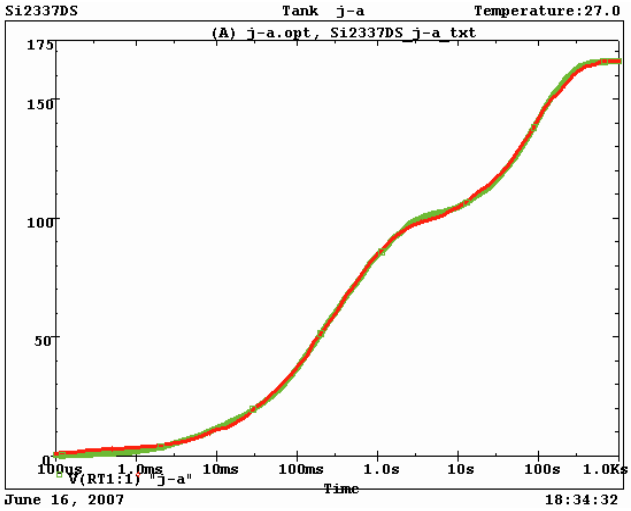


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	9.1722	N/A	4.1031
RF2	45.6571	N/A	18.8452
RF3	44.2836	N/A	12.6179
RF4	66.8871	N/A	14.4338
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	340.0548 u	N/A	140.1143 u
CF2	1.7607 m	N/A	2.8567 m
CF3	13.4876 m	N/A	8.4303 m
CF4	1.4497	N/A	36.7119 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


Si2337DS
Tank j-a
Temperature:27.0
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175
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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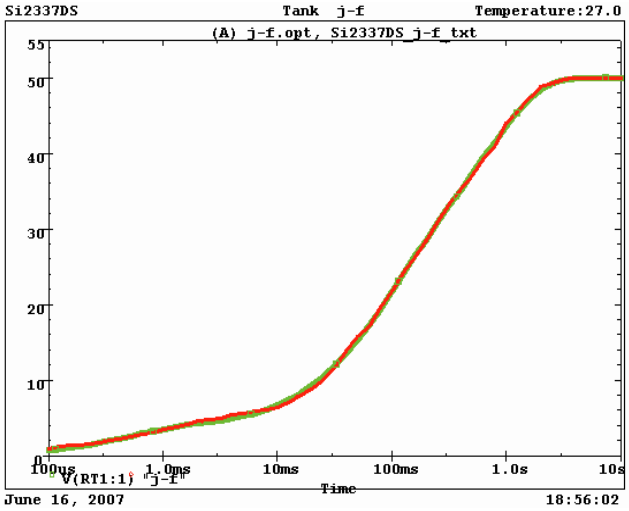
Time
June 16, 2007
18:34:32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40
30
20
10
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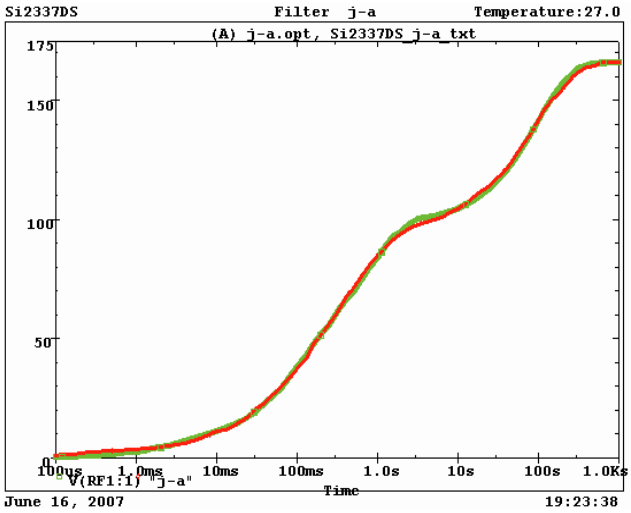
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Filter j-a
Temperature:27.0
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150
100
50
0
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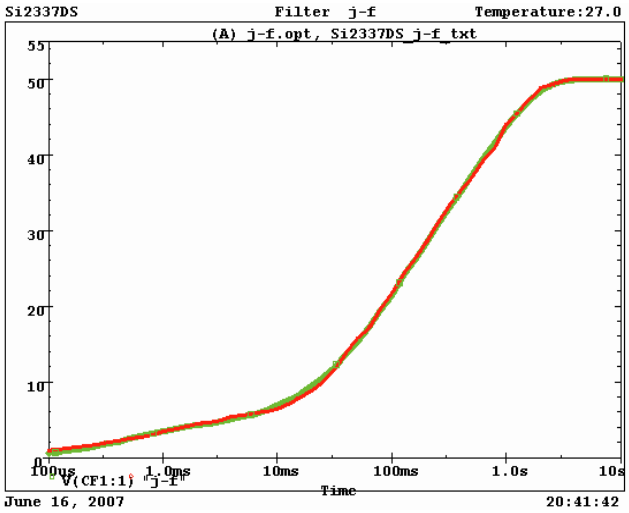
Si2337DS
Filter j-f
Temperature:27.0
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50
40
30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s
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Time
June 16, 2007
20:41:42