R-C Thermal Model Parameters

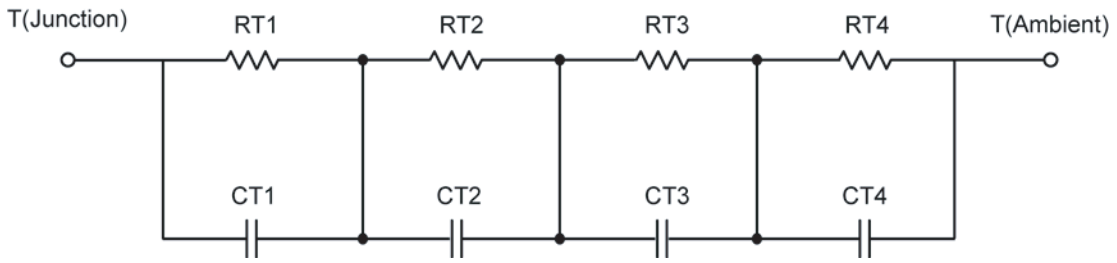
DESCRIPTION

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.

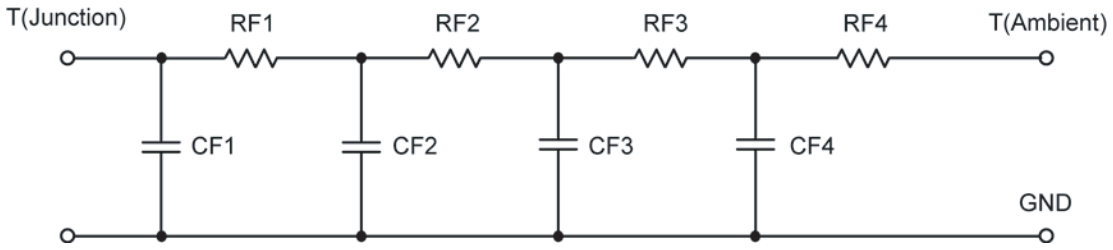
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	27.4179	N/A	10.8793
RT2	7.7888	N/A	3.1294
RT3	18.2397	N/A	8.5121
RT4	56.1996	N/A	7.4800
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	6.9455 m	N/A	3.7383 m
CT2	1.0952 m	N/A	487.9321 u
CT3	59.8102 m	N/A	23.5279 m
CT4	1.3314	N/A	20.5147 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

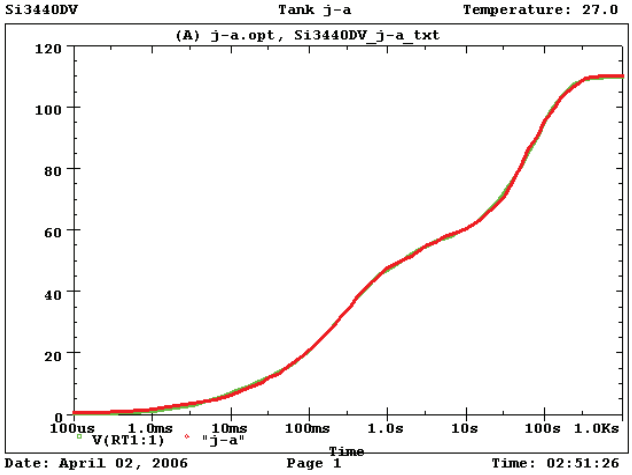


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.0609	N/A	3.4805
RF2	25.8785	N/A	10.4003
RF3	22.1016	N/A	10.8019
RF4	55.6703	N/A	5.3200
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	585.4437 u	N/A	366.4125 u
CF2	3.5347 m	N/A	2.2600 m
CF3	24.3746 m	N/A	1.3394 m
CF4	1.3064	N/A	38.5679 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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100
80
60
40
20
0
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Time
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Page 1
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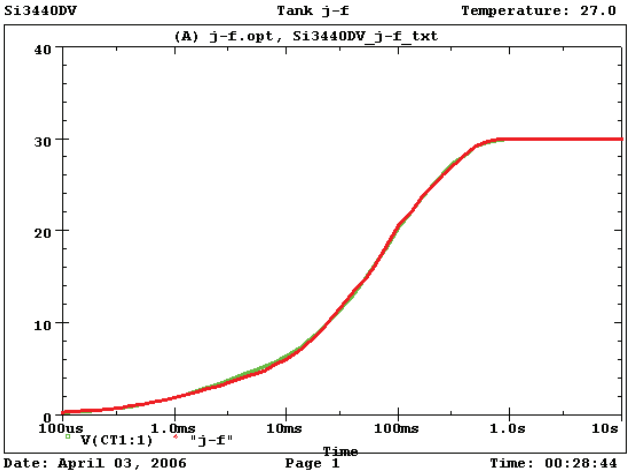
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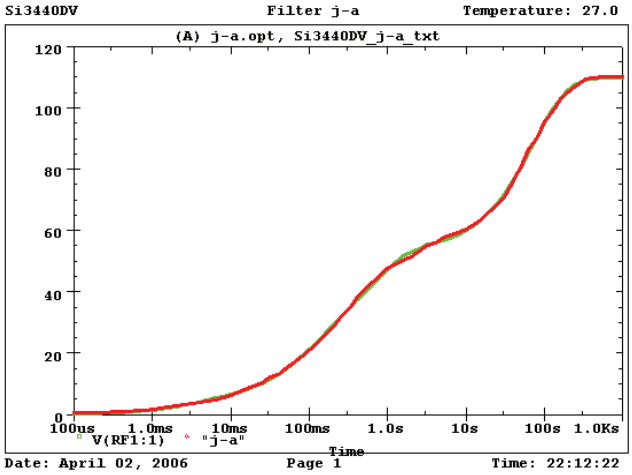
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Filter j-a
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60
40
20
0
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Time
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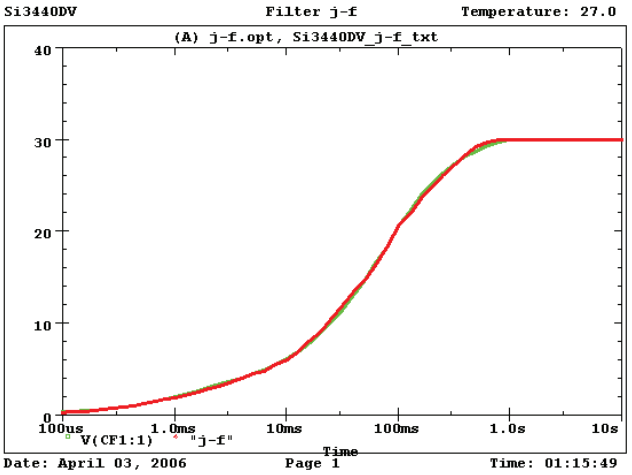
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Filter j-f
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30
20
10
0
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Page 1
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