R-C Thermal Model Parameters

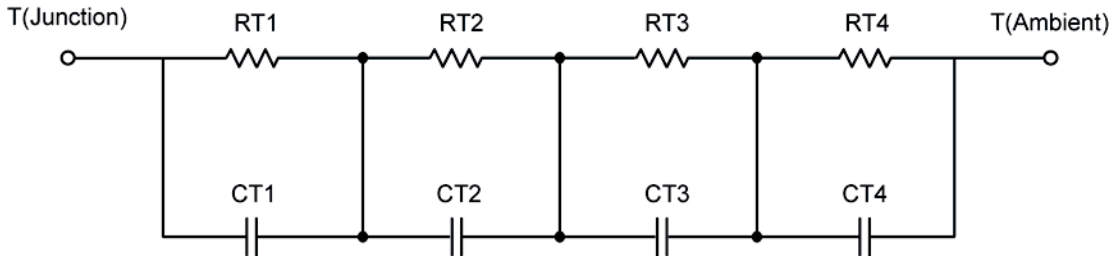
DESCRIPTION

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.

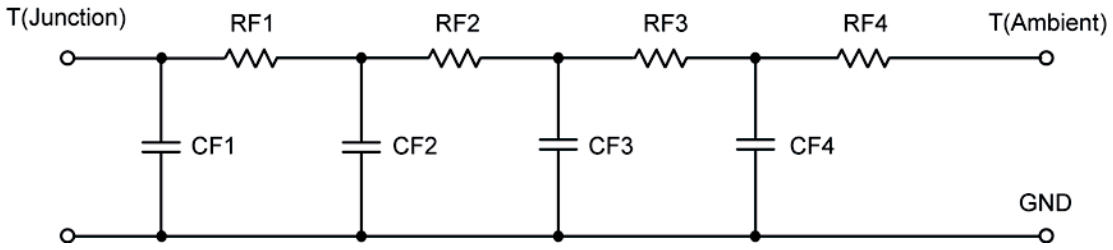
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	86.2144	N/A	109.0121
RT2	12.9988	N/A	61.4733
RT3	59.3482	N/A	52.1187
RT4	201.4386	N/A	117.3959
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.0588 m	N/A	454.0514 u
CT2	191.2934 u	N/A	152.3679 u
CT3	654.7914 m	N/A	6.3434 m
CT4	4.4576 m	N/A	356.4596 u

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

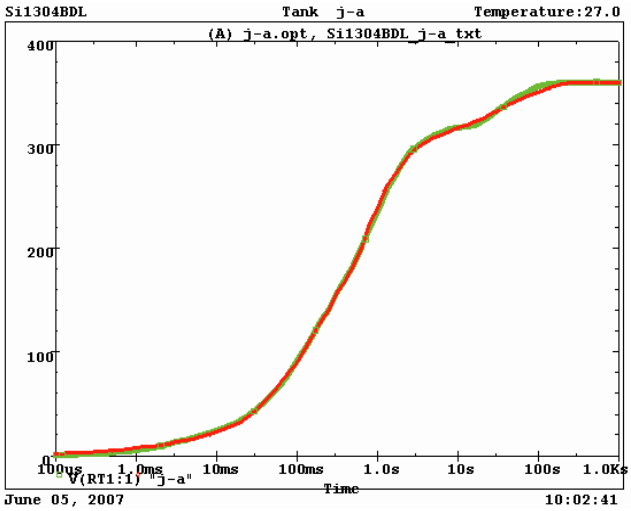


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	34.7603	N/A	139.0304
RF2	131.7373	N/A	141.9360
RF3	139.2935	N/A	54.5340
RF4	54.2089	N/A	4.4996
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	258.0262 u	N/A	83.3944 u
CF2	911.3508 u	N/A	116.5141 u
CF3	5.5458 m	N/A	2.9182 m
CF4	822.8806 m	N/A	268.9115 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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300
200
100
0
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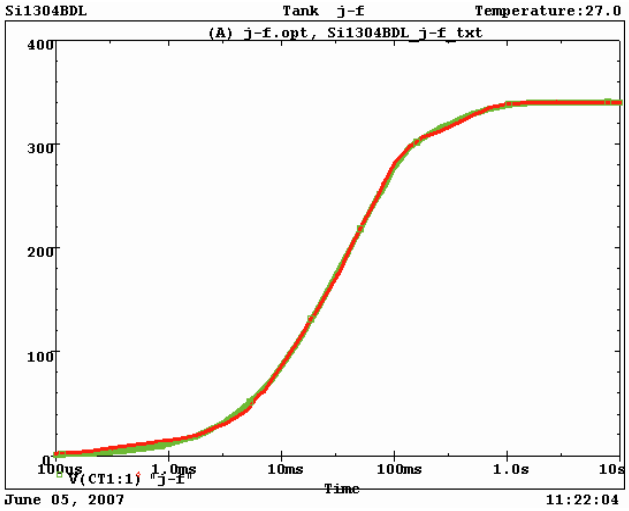
Time
June 05, 2007
10:02:41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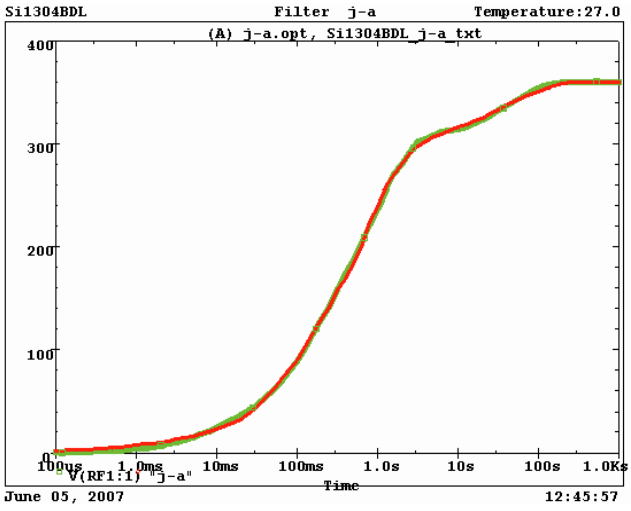
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Filter j-a
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200
100
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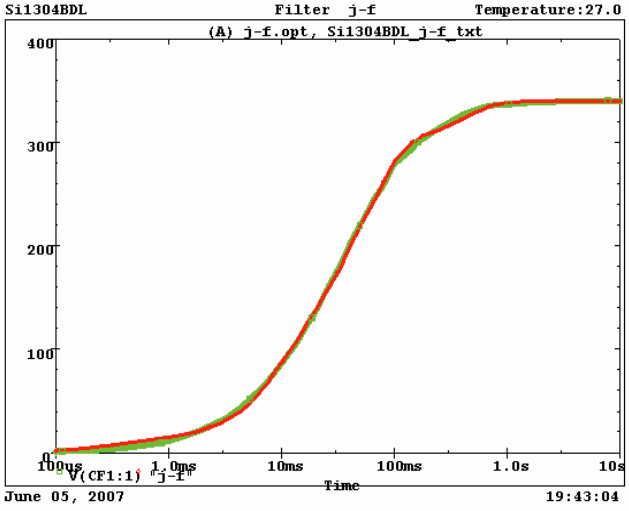
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200
100
0
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Time
June 05, 2007
19:43:04