R-C Thermal Model Parameters

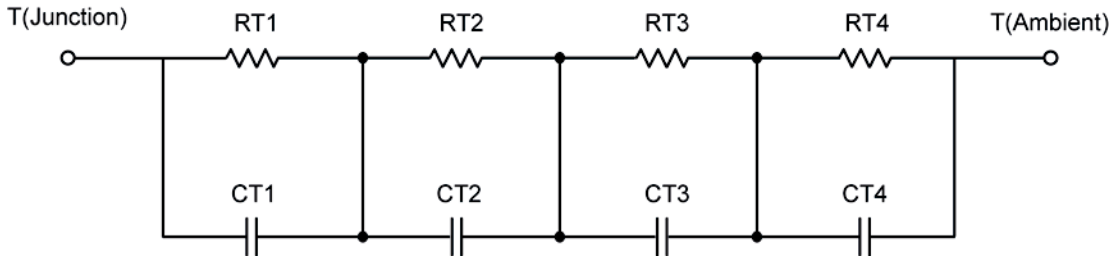
DESCRIPTION

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.

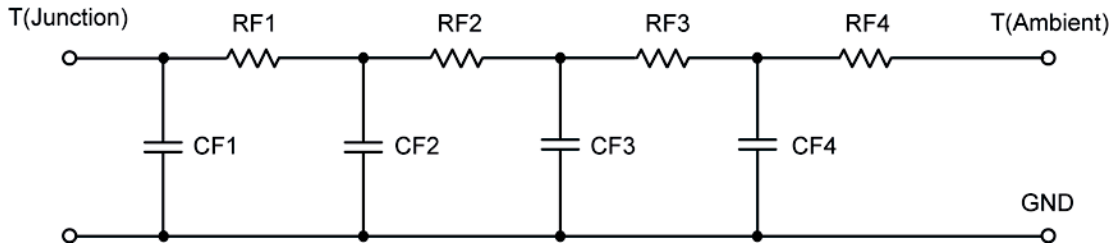
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient N-Ch**	**Ambient P-Ch**	**Foot**
RT1	60.4623	58.6690	N/A
RT2	14.9411	15.6129	N/A
RT3	54.7341	55.2668	N/A
RT4	49.8625	50.4513	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient N-Ch**	**Ambient P-Ch**	**Foot**
CT1	1.8243	1.7313	N/A
CT2	3.0726 m	2.8719 m	N/A
CT3	25.5429 m	27.1470 m	N/A
CT4	9.3817 m	9.7781 m	N/A

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

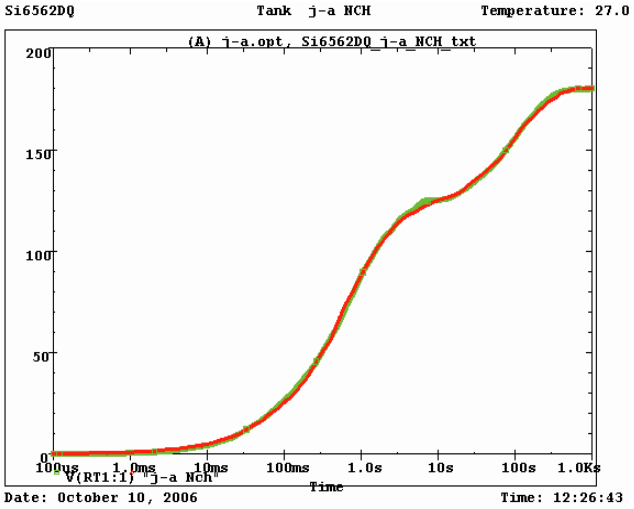


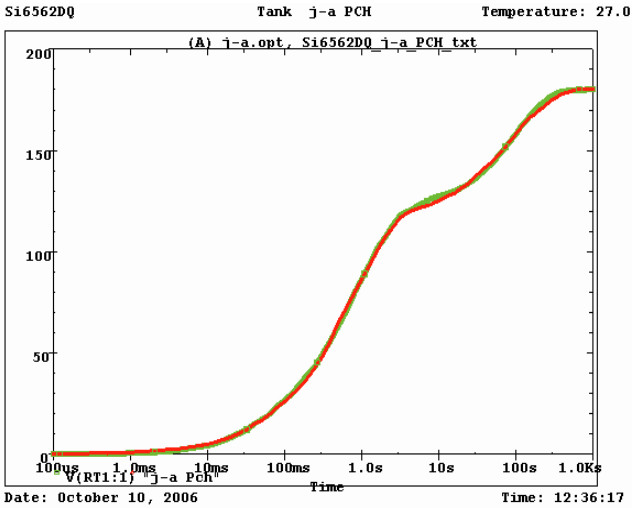
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient N-Ch**	**Ambient P-Ch**	**Foot**
RF1	33.8072	33.8999	N/A
RF2	50.0899	51.7753	N/A
RF3	37.6983	36.4067	N/A
RF4	58.4046	57.9181	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient N-Ch**	**Ambient P-Ch**	**Foot**
CF1	2.4404 m	2.3628 m	N/A
CF2	4.8011 m	5.4969 m	N/A
CF3	23.0576 m	19.8405 m	N/A
CF4	1.8984	1.7328	N/A

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


Si6562DQ
Tank j-a NCH
Temperature: 27.0
(A) j-a.opt, Si6562DQ_j-a_NCH_txt
200
150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a Nch"
Time
Date: October 10, 2006
Time: 12:26:43


Si6562DQ
Tank j-a PCH
Temperature: 27.0
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150
100
50
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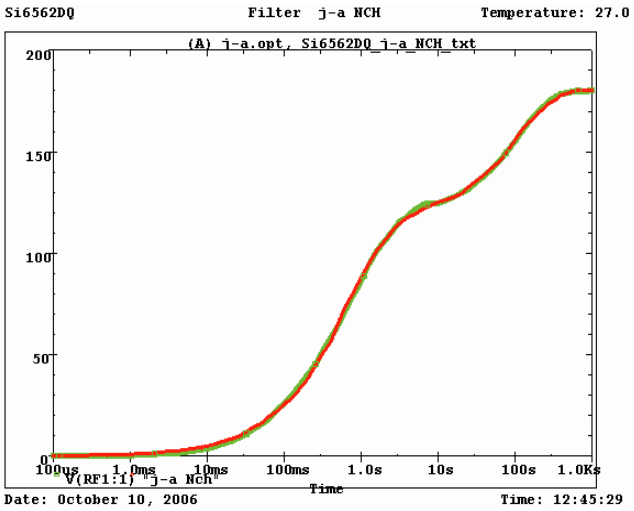
Si6562DQ
Filter j-a NCH
Temperature: 27.0
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150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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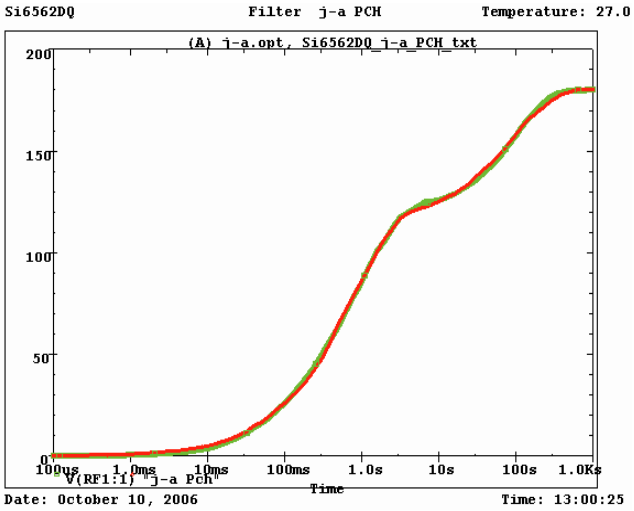
Time: 12:45:29


Si6562DQ
Filter j-a PCH
Temperature: 27.0
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150
100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RF1:1) "j-a Pch"
Time
Date: October 10, 2006
Time: 13:00:25