R-C Thermal Model Parameters

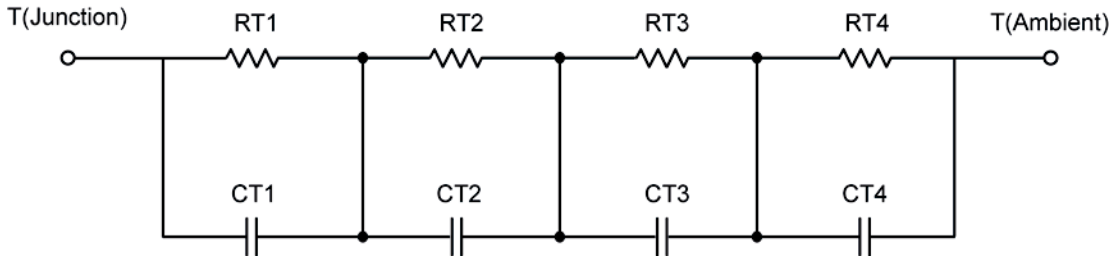
DESCRIPTION

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.

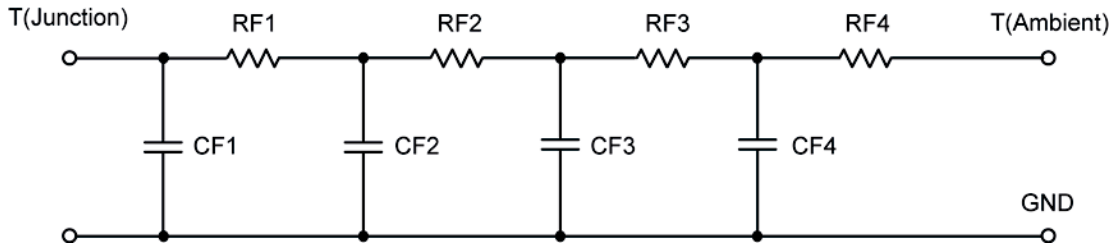
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	15.0539	N/A	26.1733
RT2	87.5420	N/A	32.9065
RT3	6.0259	N/A	9.7466
RT4	41.3782	N/A	6.1736
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.7488 m	N/A	48.6698 m
CT2	9.4137 m	N/A	10.5326 m
CT3	8.8327 m	N/A	7.4509 m
CT4	1.3399	N/A	3.7067 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

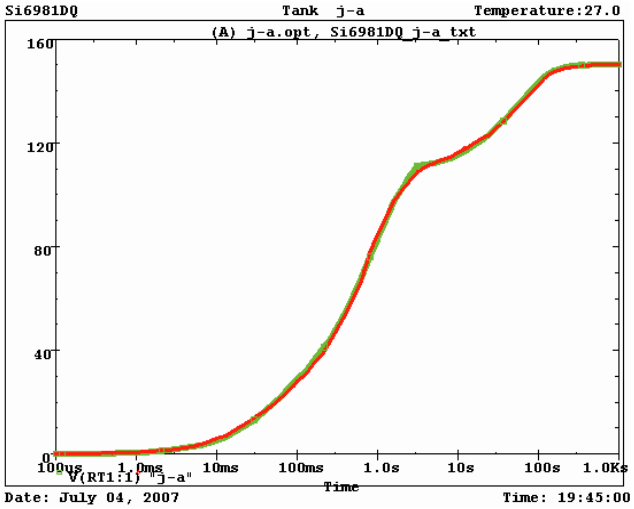


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	18.3376	N/A	10.7258
RF2	36.5492	N/A	13.6338
RF3	54.4923	N/A	18.6293
RF4	40.6209	N/A	32.0111
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.1511 m	N/A	1.7968 m
CF2	5.7897 m	N/A	1.0445 m
CF3	2.8122 m	N/A	4.1115 m
CF4	1.3222	N/A	15.8026 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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120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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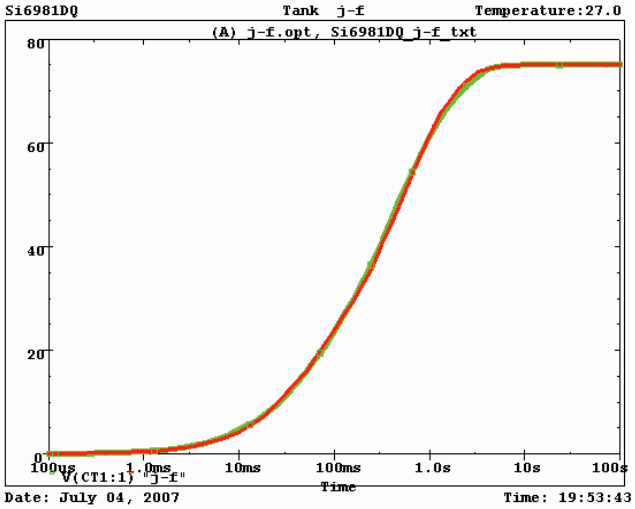
Time
Date: July 04, 2007
Time: 19:45:00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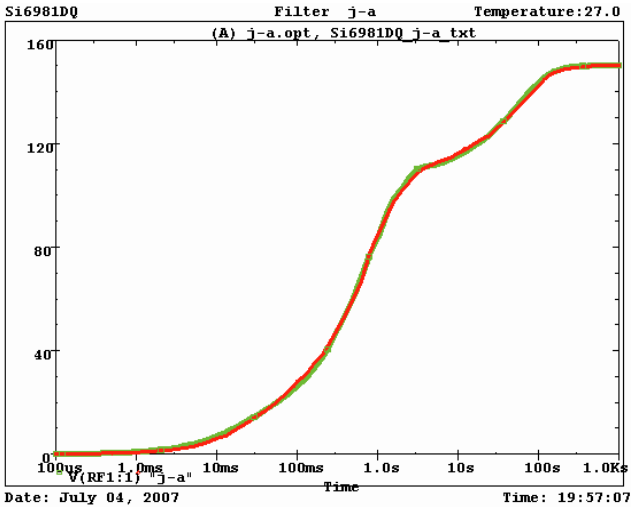
Si6981DQ
Filter j-a
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80
40
0
100us
1.0ms
10ms
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1.0s
10s
100s
1.0Ks
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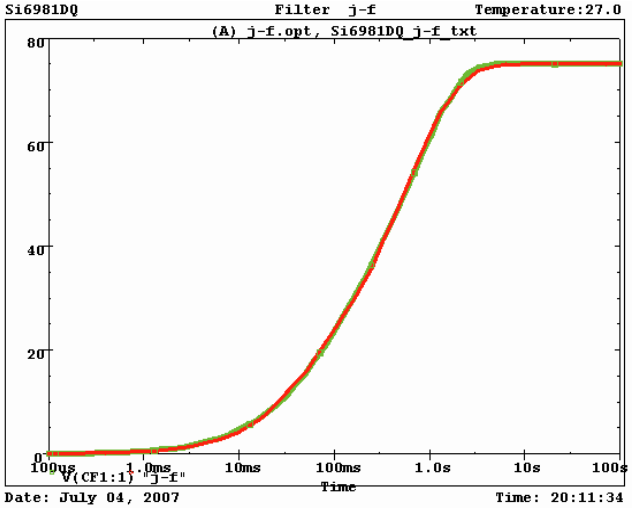
Time: 19:57:07


Si6981DQ
Filter j-f
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1) "j-f"
Time
Date: July 04, 2007
Time: 20:11:34