R-C Thermal Model Parameters

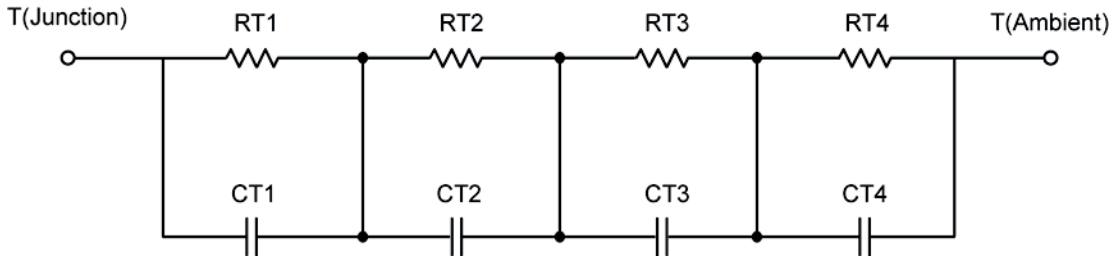
DESCRIPTION

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.

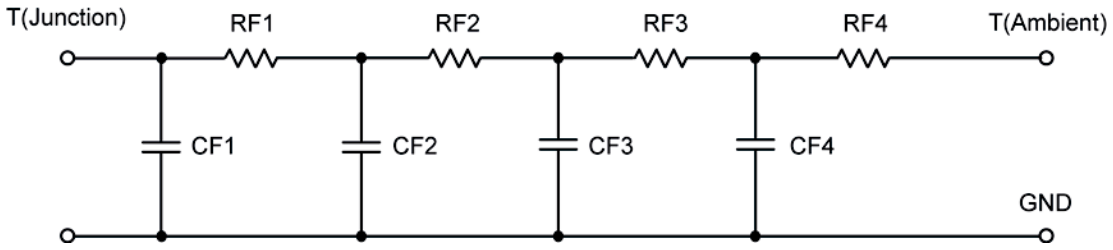
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	41.6492	N/A	14.6446
RT2	44.6228	N/A	37.4034
RT3	18.0823	N/A	30.1142
RT4	45.6457	N/A	7.8378
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	11.4251 m	N/A	4.3719 m
CT2	25.4128 m	N/A	29.9032 m
CT3	714.9994 u	N/A	12.8329 m
CT4	1.3996	N/A	236.4579 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

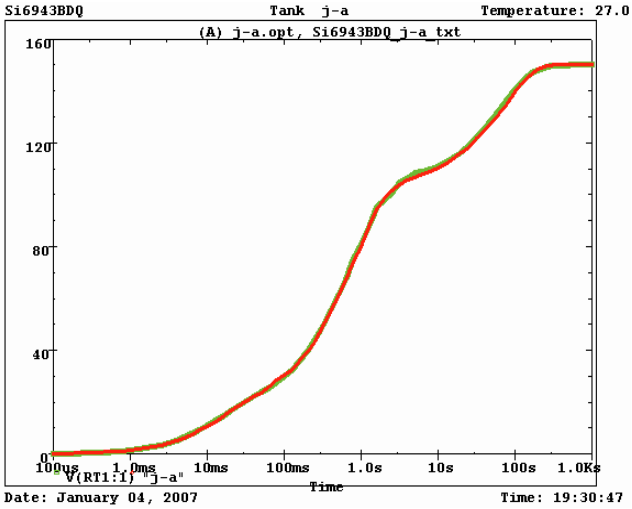


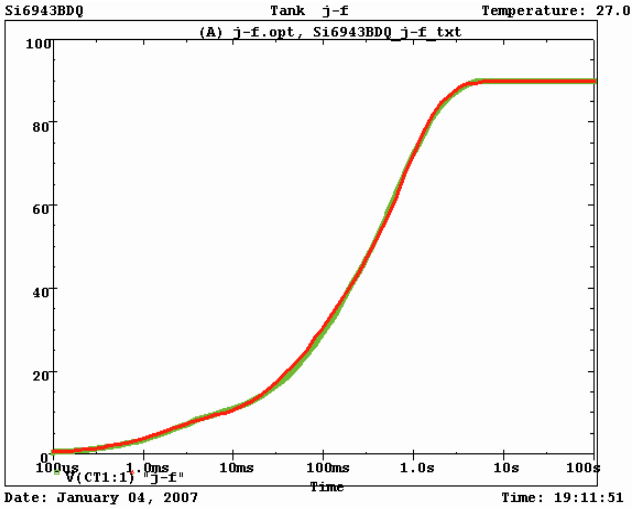
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	19.1973	N/A	4.5563
RF2	34.8418	N/A	9.4167
RF3	48.4147	N/A	31.0150
RF4	47.5462	N/A	45.0120
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	623.8645 u	N/A	79.6667 u
CF2	5.7263 m	N/A	847.8969 u
CF3	5.6466 m	N/A	2.6649 m
CF4	1.2573	N/A	14.3545 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


Si6943BDQ
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si6943BDQ_j-a_txt
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: January 04, 2007
Time: 19:30:47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Tank j-f
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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Time
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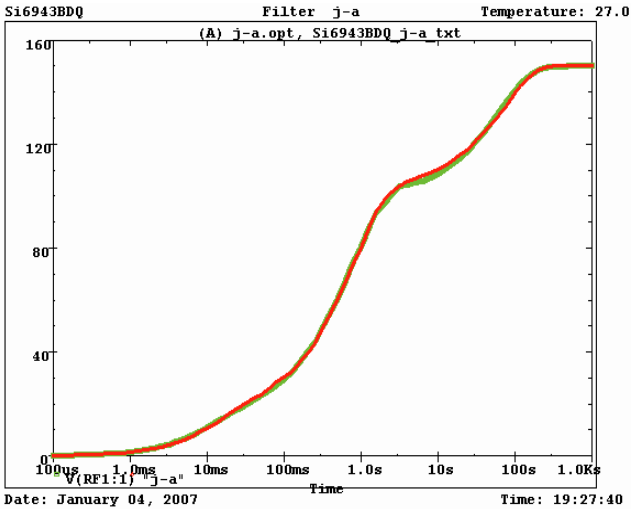
Time: 19:11:51


Si6943BDQ
Filter j-a
Temperature: 27.0
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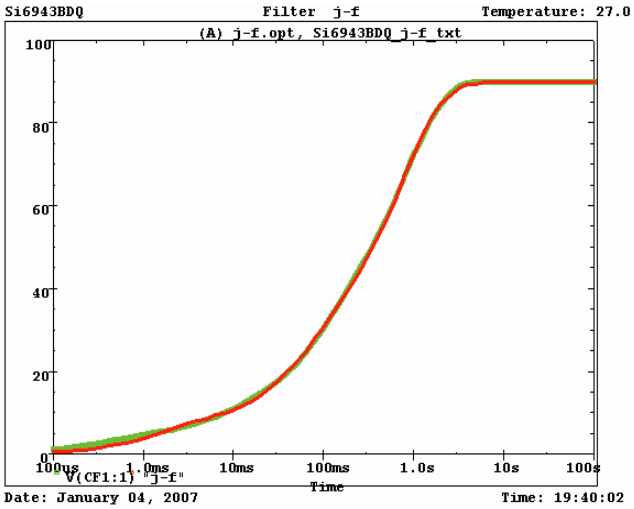
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: January 04, 2007
Time: 19:27:40


Si6943BDQ
Filter j-f
Temperature: 27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1) "j-f"
Time
Date: January 04, 2007
Time: 19:40:02