R-C Thermal Model Parameters

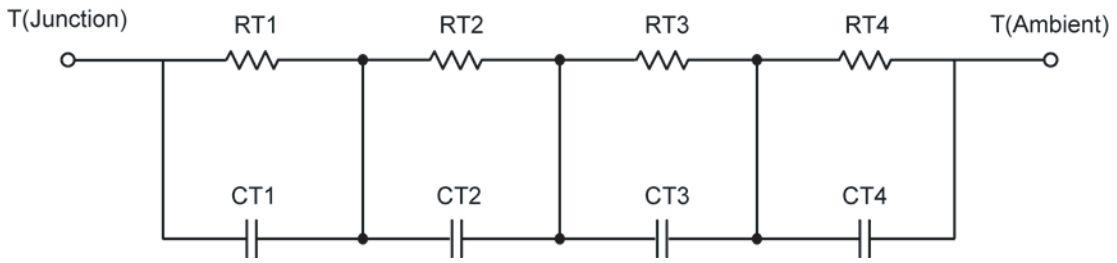
DESCRIPTION

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.

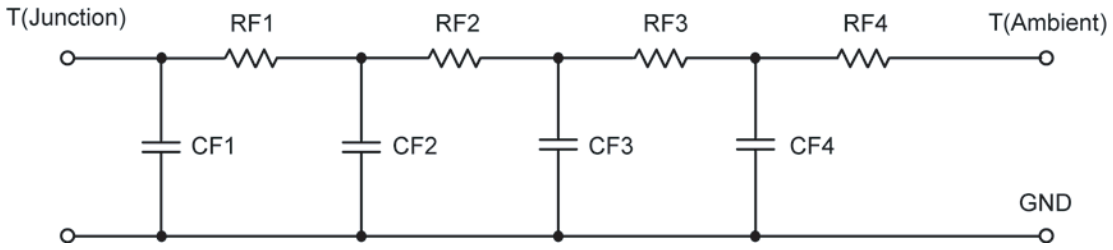
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	54.1717	N/A	48.0707
RT2	16.1135	N/A	12.9024
RT3	71.7294	N/A	8.5961
RT4	77.9854	N/A	30.4308
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3525	N/A	592.9211 u
CT2	43.9187 u	N/A	49.6255 u
CT3	8.9982 m	N/A	265.2869 m
CT4	616.3284 u	N/A	2.9450 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

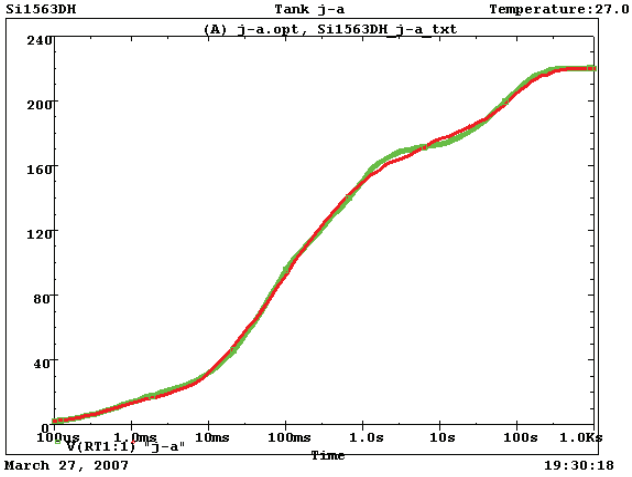


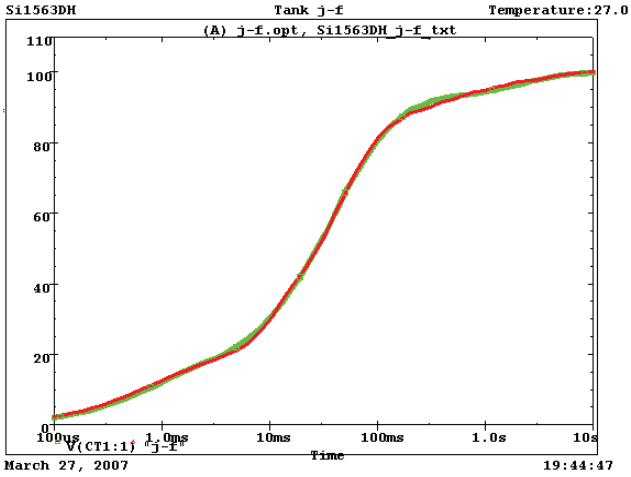
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	19.4916	N/A	15.2036
RF2	84.5646	N/A	70.0930
RF3	62.3054	N/A	274.2000 m
RF4	53.6384	N/A	14.4292
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	47.7227 u	N/A	41.4000 u
CF2	539.9065 u	N/A	488.7300 u
CF3	9.3099 m	N/A	27.9274 m
CF4	1.3482	N/A	26.8167 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


Si1563DH
Tank j-a
Temperature:27.0
(A) j-a.opt, Si1563DH_j-a_txt
240
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
March 27, 2007
19:30:18


Si1563DH
Tank j-f
Temperature:27.0
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100
80
60
40
20
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100us
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10ms
100ms
1.0s
10s
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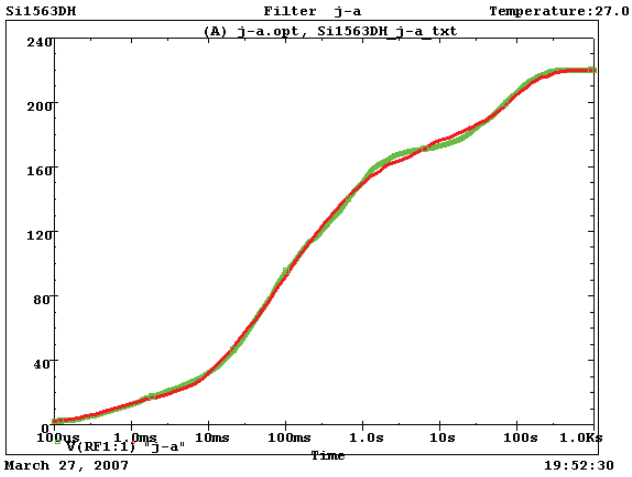
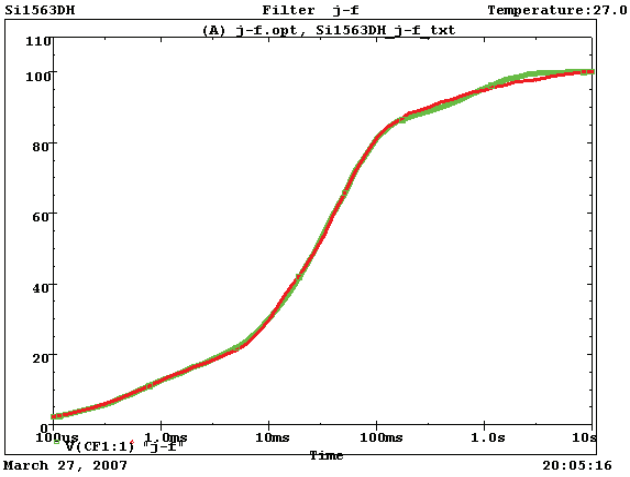
Time
March 27, 2007
19:44:47


Si1563DH
Filter j-a
Temperature:27.0
(A) j-a.opt, Si1563DH_j-a_txt
240
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
March 27, 2007
19:52:30


Si1563DH
Filter j-f
Temperature:27.0
(A) j-f.opt, Si1563DH_j-f_txt
110
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
March 27, 2007
20:05:16