R-C Thermal Model Parameters

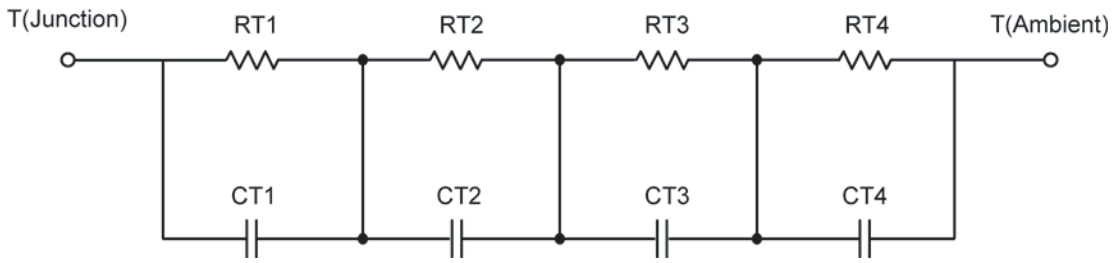
DESCRIPTION

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.

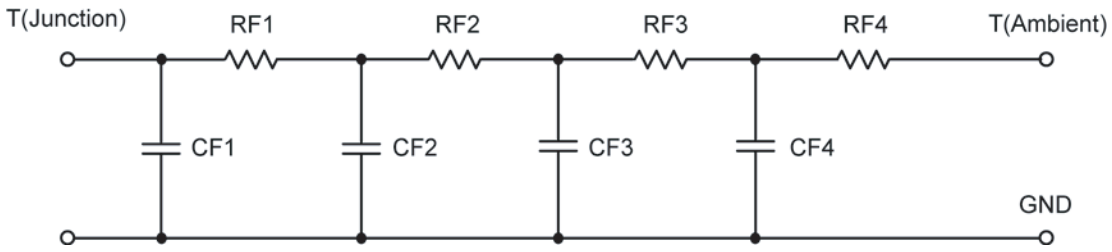
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	16.6549	N/A	11.1439
RT2	11.1784	N/A	5.1974
RT3	28.9565	N/A	3.0531
RT4	52.4564	N/A	17.3792
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	98.6805 m	N/A	18.4700 m
CT2	501.5862 µ	N/A	397.5663 µ
CT3	5.9362 m	N/A	1.5350
CT4	1.4829	N/A	3.1863 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

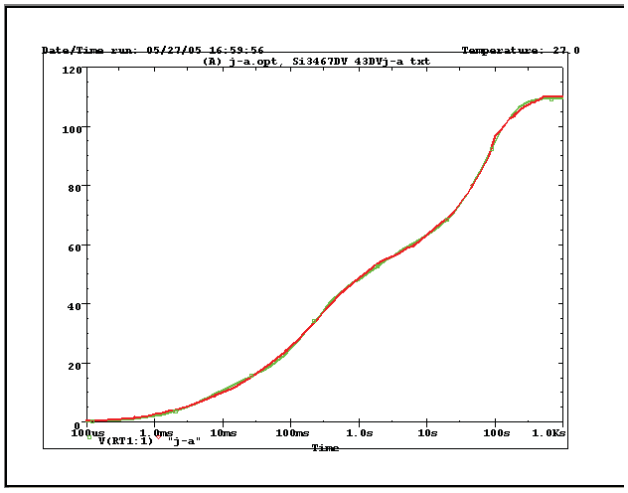


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.9729	N/A	6.7320
RF2	24.2701	N/A	11.7053
RF3	19.7308	N/A	11.4814
RF4	52.1097	N/A	5.5627
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	479.1678 µ	N/A	377.2233 µ
CF2	4.3538 m	N/A	2.0619 m
CF3	37.4663 m	N/A	2.1553 m
CF4	1.3900	N/A	69.7905 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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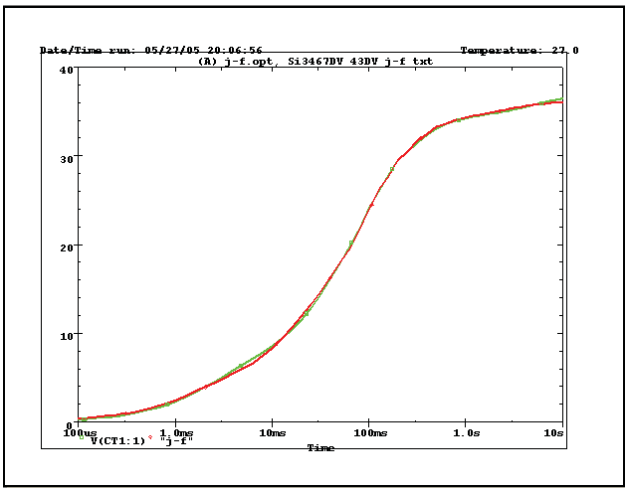
Temperature: 27.0
(A) j-a.opt, Si3467DV 43DVj-a.txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time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30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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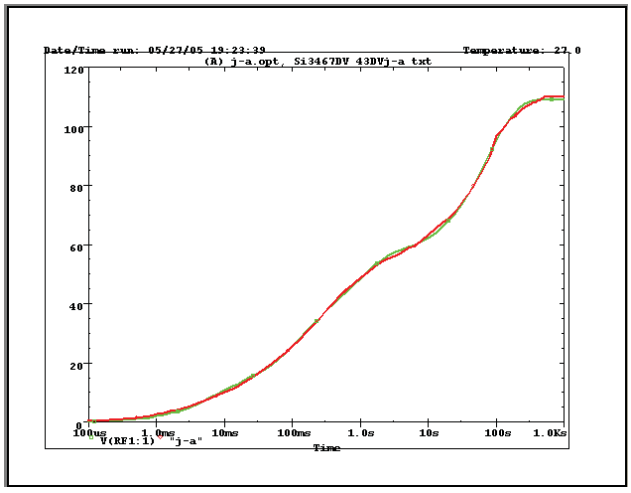
Time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80
60
40
20
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100us
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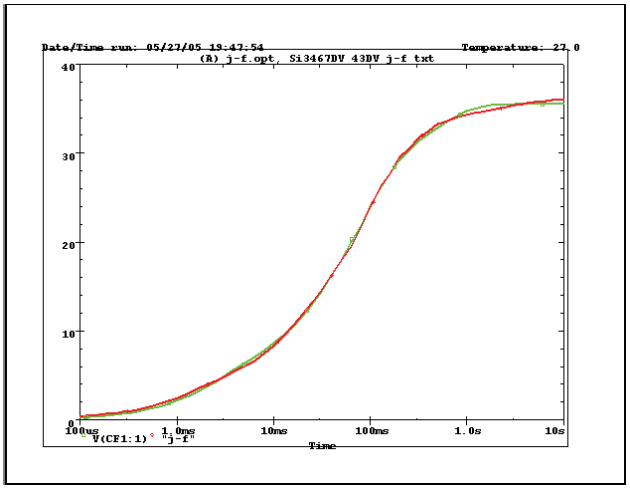
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time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30
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10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time