R-C Thermal Model Parameters

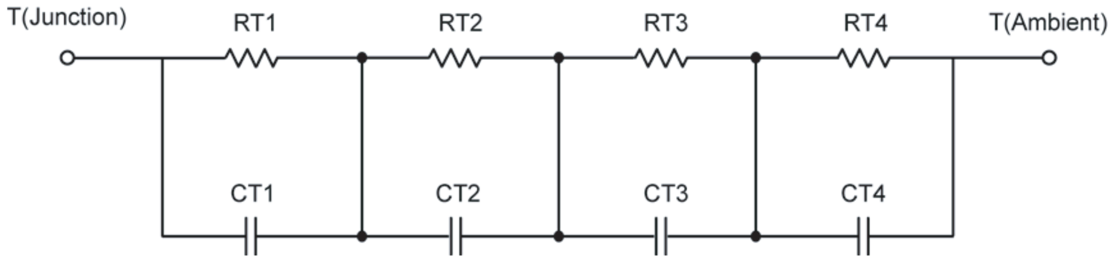
DESCRIPTION

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.

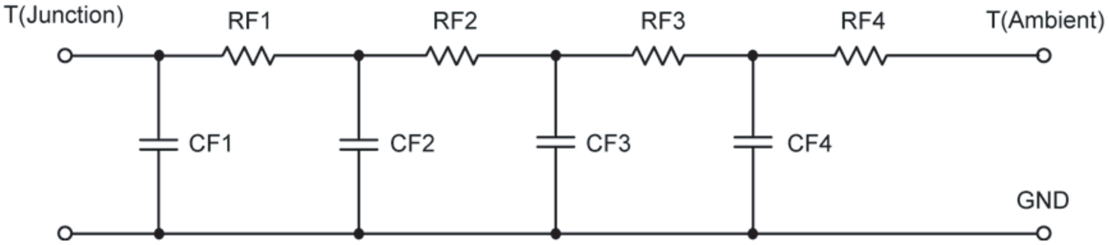
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
	Thermal Resistance (°C/W)		
Junction to	**Ambient**	**Case**	**Foot**
RT1	15.5802	N/A	13.9391
RT2	10.6052	N/A	15.2004
RT3	28.3155	N/A	6.4998
RT4	55.4991	N/A	5.3607
	Thermal Capacitance (Joules/°C)		
Junction to	**Ambient**	**Case**	**Foot**
CT1	95.2581 m	N/A	3.2745 m
CT2	492.8587 u	N/A	8.1987 m
CT3	5.7462 m	N/A	240.8130 m
CT4	1.5858	N/A	322.0731 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



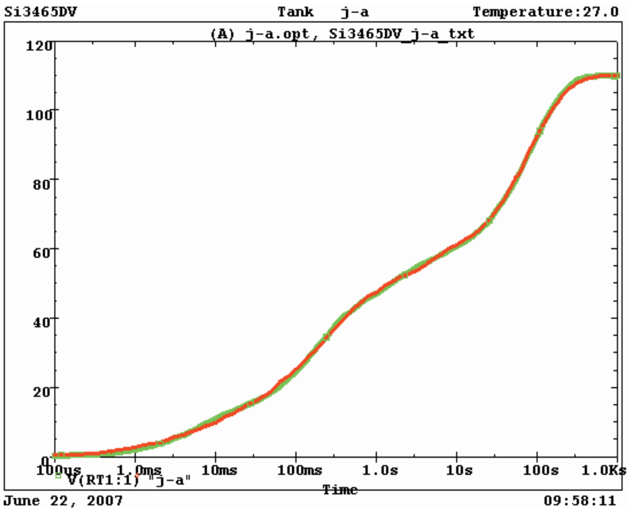
R-C VALUES FOR FILTER CONFIGURATION

Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.6722	N/A	6.3184
RF2	30.6842	N/A	17.7356
RF3	15.3329	N/A	11.3517
RF4	51.3107	N/A	5.5943
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	451.7455 u	N/A	279.0812 u
CF2	5.3255 m	N/A	1.7749 m
CF3	134.7193 m	N/A	5.5590 m
CF4	1.6811	N/A	262.0864 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


Si3465DV
Tank j-a
Temperature:27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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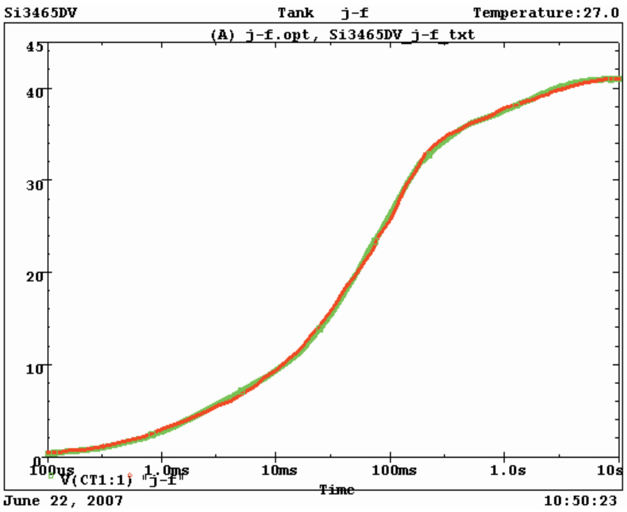
Time
June 22, 2007
09:58:11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40
30
20
10
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10ms
100ms
1.0s
10s
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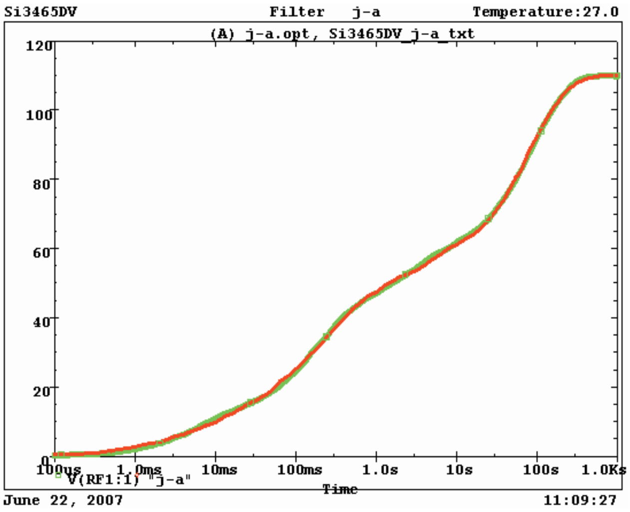
10:50:23


Si3465DV
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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Time
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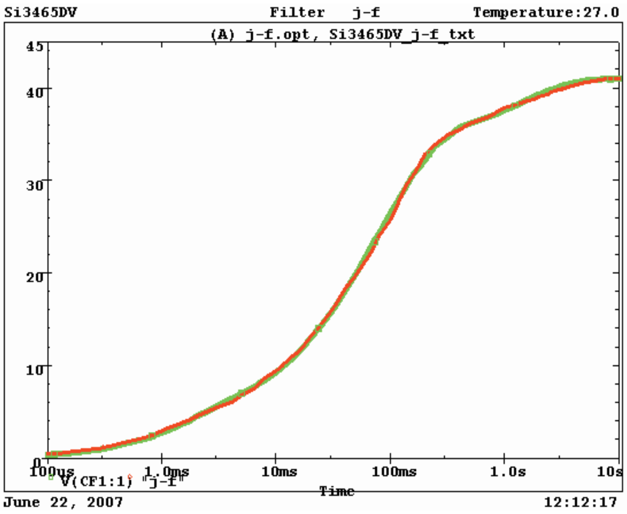
11:09:27


Si3465DV
Filter j-f
Temperature:27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
June 22, 2007
12:12:17