R-C Thermal Model Parameters

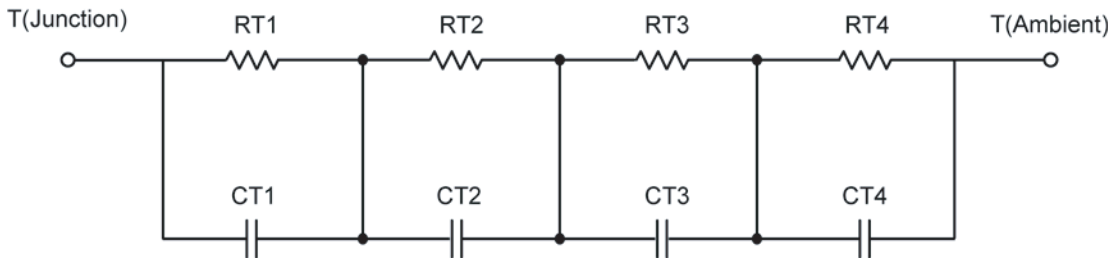
DESCRIPTION

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.

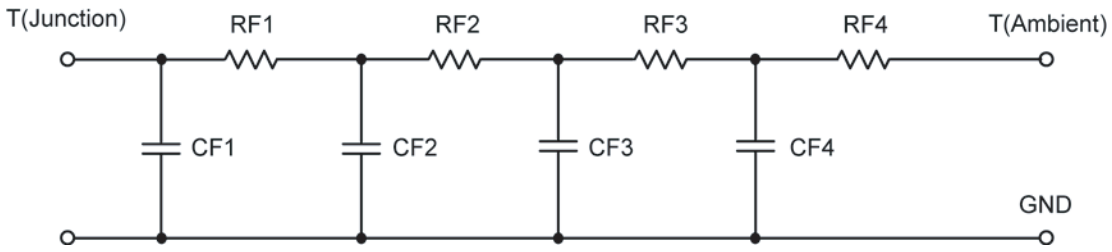
Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.6824	N/A	1.4117
RT2	27.9345	N/A	5.3366
RT3	29.3199	N/A	8.8613
RT4	24.3510	N/A	5.2589
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	11.7237 m	N/A	18.1614 m
CT2	40.6538 m	N/A	136.3002 m
CT3	1.9573	N/A	156.5560 m
CT4	4.6614	N/A	10.8458 m

R-C THERMAL MODEL FOR FILTER CONFIGURATION

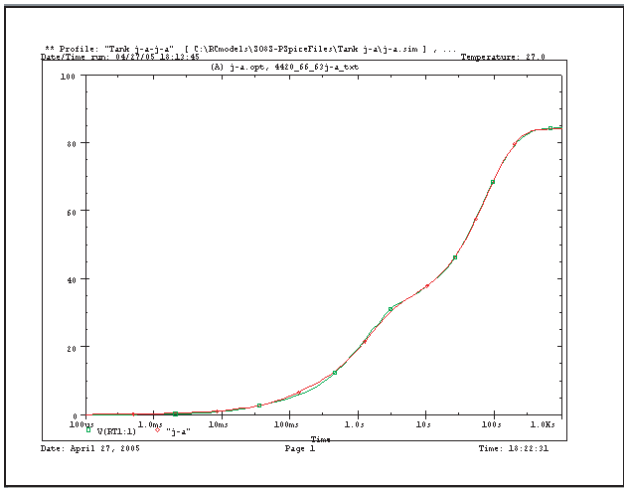


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.1750	N/A	3.1967
RF2	28.6937	N/A	6.0553
RF3	27.1931	N/A	8.8925
RF4	24.0515	N/A	2.7325
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	6.9656 m	N/A	4.2290 m
CF2	34.5122 m	N/A	9.4788 m
CF3	1.2922	N/A	76.9906 m
CF4	1.0594	N/A	179.1226 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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60
40
20
0
100u
1.0m
10m
100m
1.0
10
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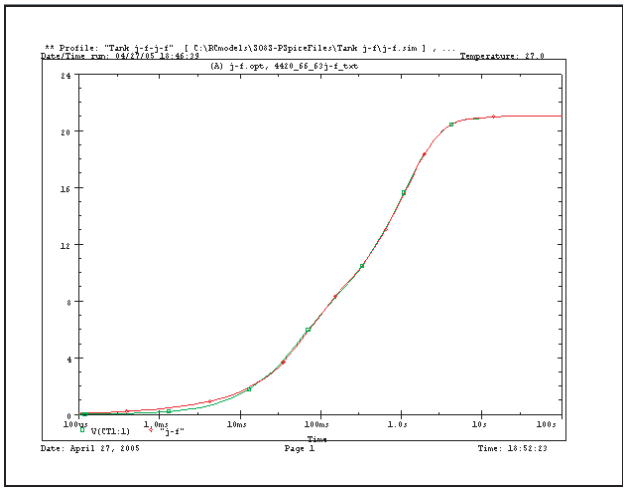
Time
Date: April 27, 2005
Page 1
Time: 18:22:31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12
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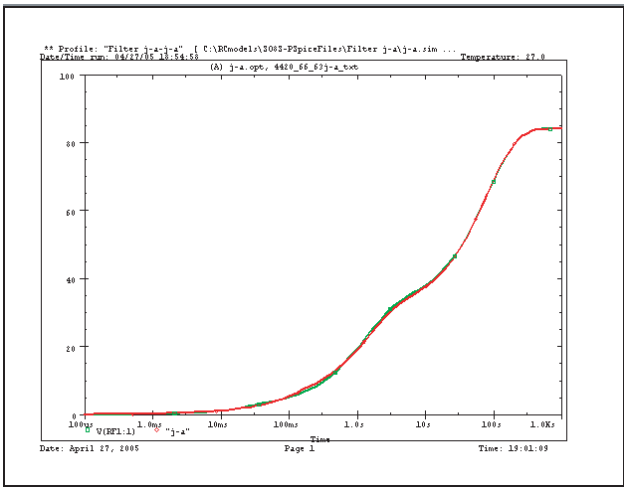
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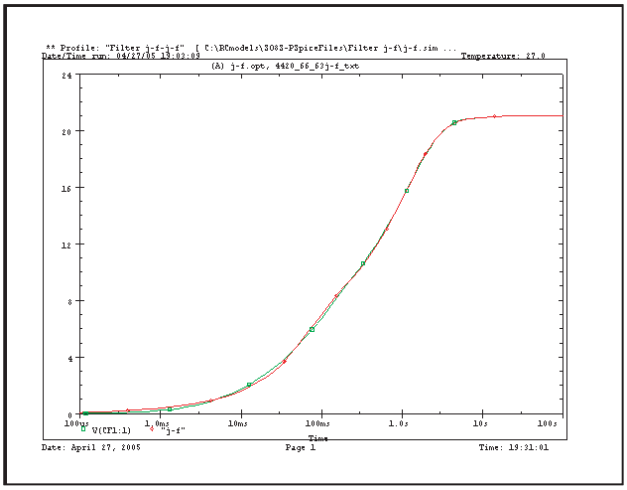
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12
8
4
0
100u
1.0m
10m
100m
1.0
10
100
V(CTL:1)
"j-f"
Time
Date: April 27, 2005
Page 1
Time: 19:31:01