R-C Thermal Model Parameters

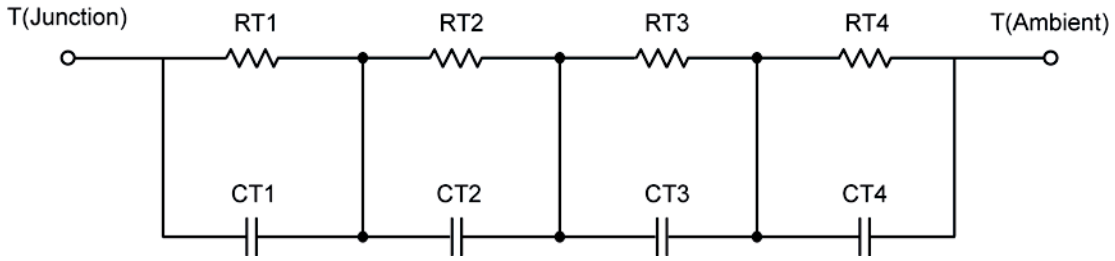
DESCRIPTION

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.

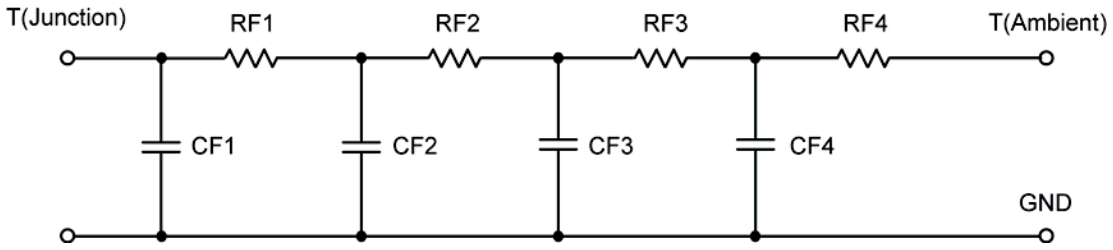
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	95.1746	N/A	32.0269
RT2	25.5498	N/A	9.7478
RT3	33.1443	N/A	24.5305
RT4	65.9397	N/A	63.4876
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.2797 m	N/A	617.6915 u
CT2	1.7696 m	N/A	134.9667 u
CT3	2.3109	N/A	81.5496m
CT4	8.7364 m	N/A	2.1717 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

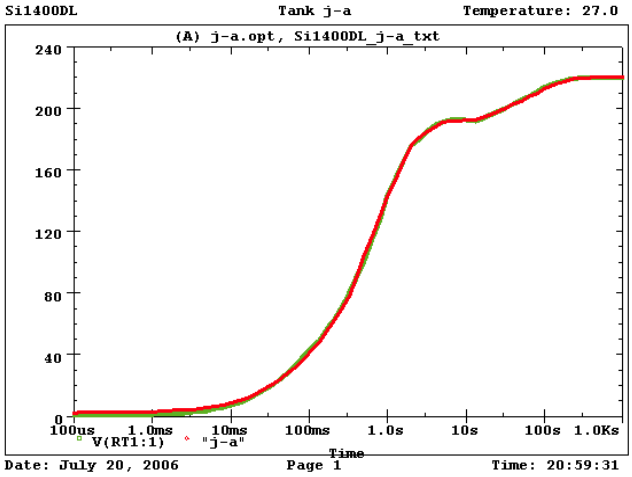


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.7970	N/A	16.6303
RF2	77.6265	N/A	42.8883
RF3	101.8472	N/A	47.0292
RF4	31.3842	N/A	22.9506
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	275.9877 u	N/A	106.1169 u
CF2	2.2515 m	N/A	468.2106 u
CF3	4.3897 m	N/A	1.6296 m
CF4	2.0216	N/A	71.8673 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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Tank j-a
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200
160
120
80
40
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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Time
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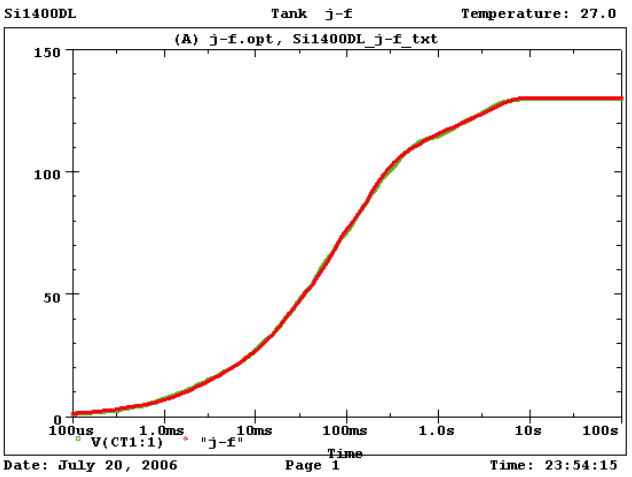
Page 1
Time: 20:59:31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Page 1
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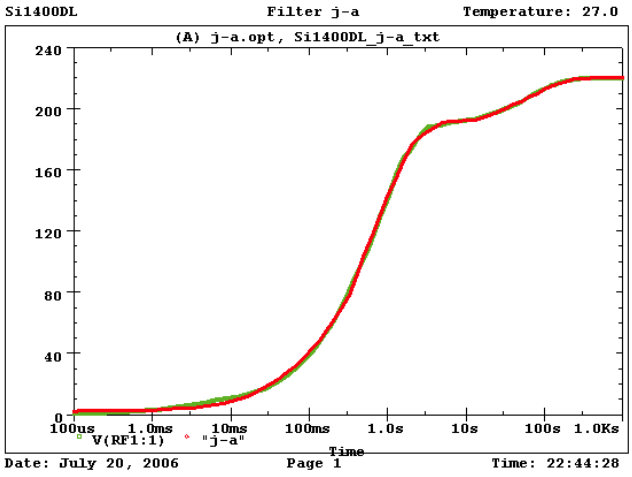
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Filter j-a
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200
160
120
80
40
0
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Page 1
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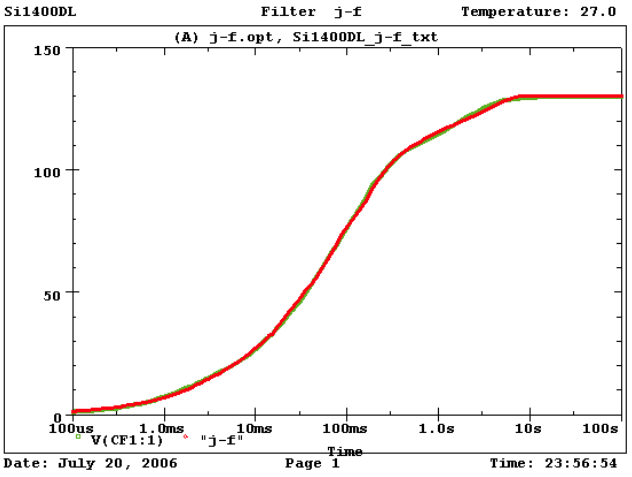
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Filter j-f
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100
50
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date: July 20, 2006
Page 1
Time: 23:56:54