R-C Thermal Model Parameters

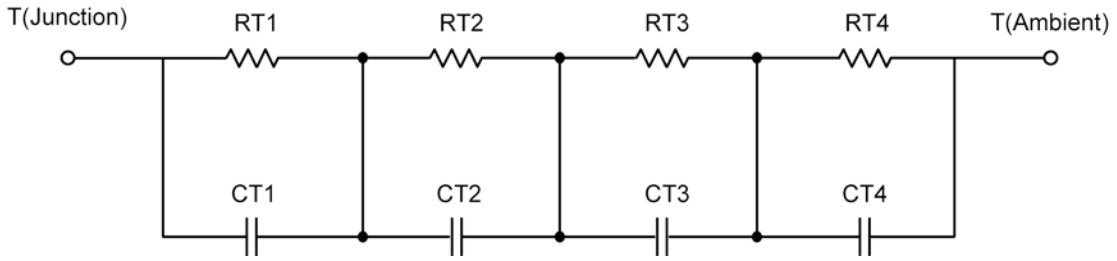
DESCRIPTION

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.

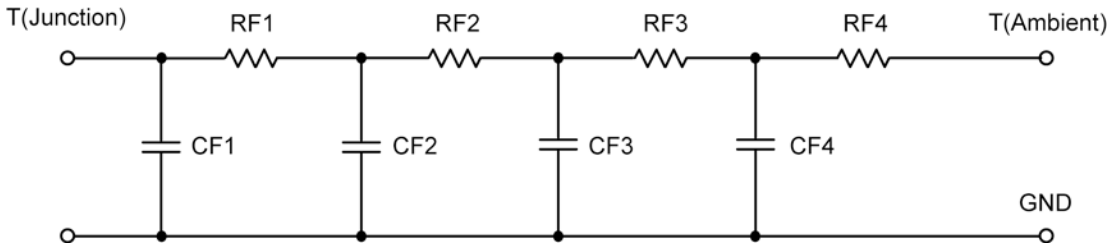
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.3439	1.4264	N/A
RT2	50.7464	1.3011	N/A
RT3	9.2053	1.7623	N/A
RT4	12.7044	1.5102	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.4171 m	2.4681 m	N/A
CT2	1.8723	457.2535 u	N/A
CT3	57.9244 m	48.0148 m	N/A
CT4	750.3124 m	8.7268 m	N/A

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

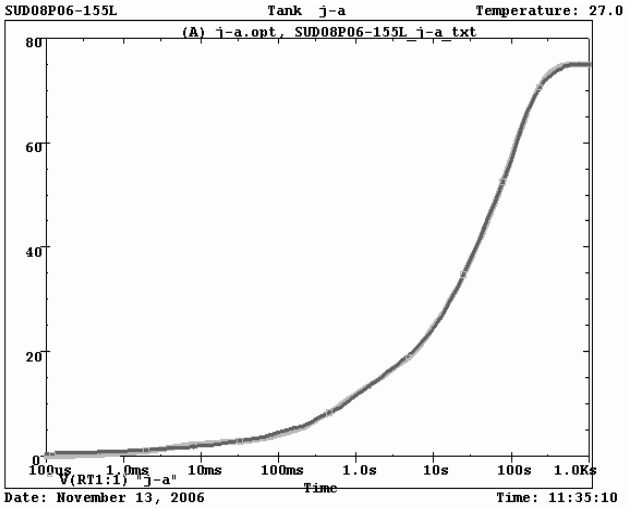


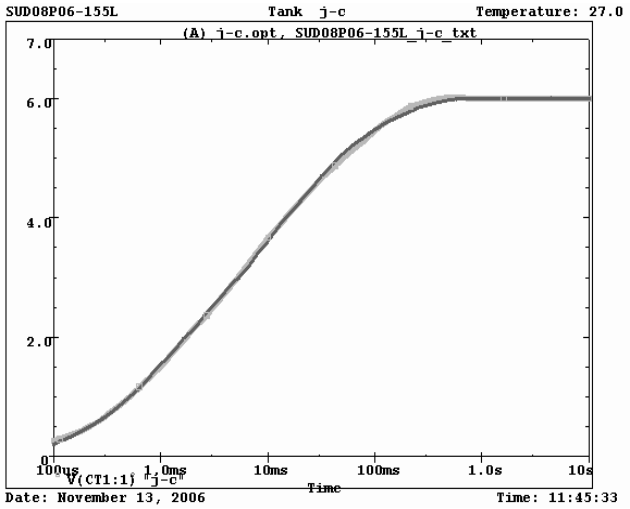
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.5819	2.0805	N/A
RF2	11.1179	1.5439	N/A
RF3	23.6014	1.2247	N/A
RF4	37.6988	1.1510	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.0800 m	342.7041 u	N/A
CF2	52.7331 m	2.9367 m	N/A
CF3	538.8632 m	3.6627 m	N/A
CF4	1.8734	70.7118 m	N/A

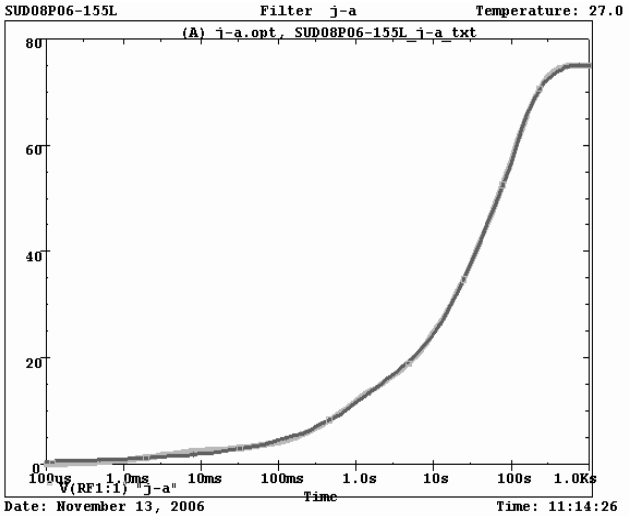
Note: NA indicates not applicable

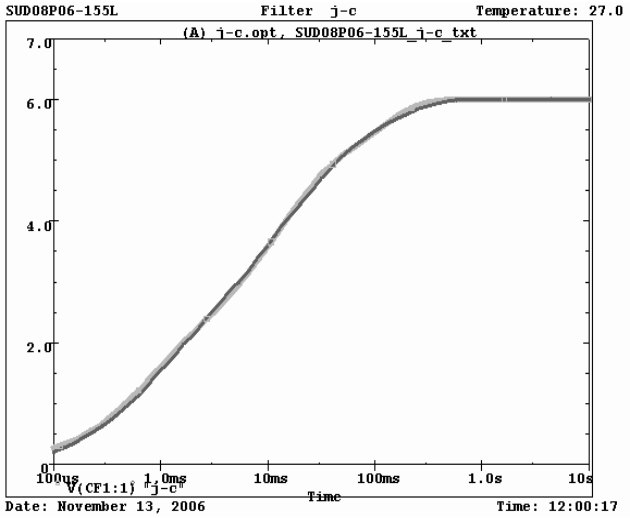
Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002


SUD08P06-155L
Tank j-a
Temperature: 27.0
(A) j-a.opt, SUD08P06-155L_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: November 13, 2006
Time: 11:35:10


SUD08P06-155L
Tank j-c
Temperature: 27.0
(A) j-c.opt, SUD08P06-155L_j-c_txt
7.0
6.0
4.0
2.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-c"
Time
Date: November 13, 2006
Time: 11:45:33


SUD08P06-155L
Filter j-a
Temperature: 27.0
(A) j-a.opt, SUD08P06-155L_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: November 13, 2006
Time: 11:14:26


SUD08P06-155L
Filter j-c
Temperature: 27.0
(A) j-c.opt, SUD08P06-155L_j-c_txt
7.0
6.0
4.0
2.0
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-c"
Time
Date: November 13, 2006
Time: 12:00:17