R-C Thermal Model Parameters

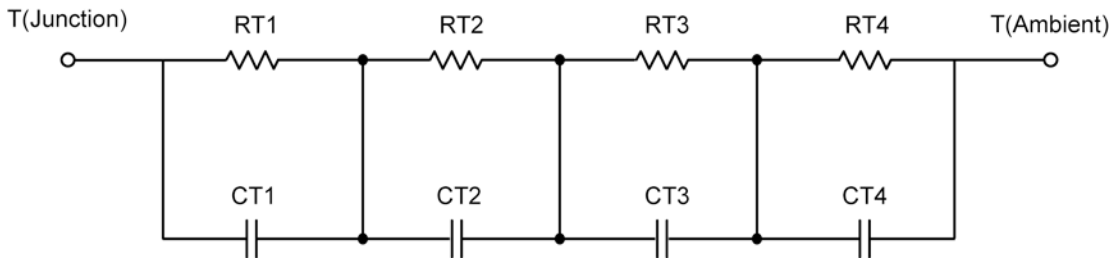
DESCRIPTION

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.

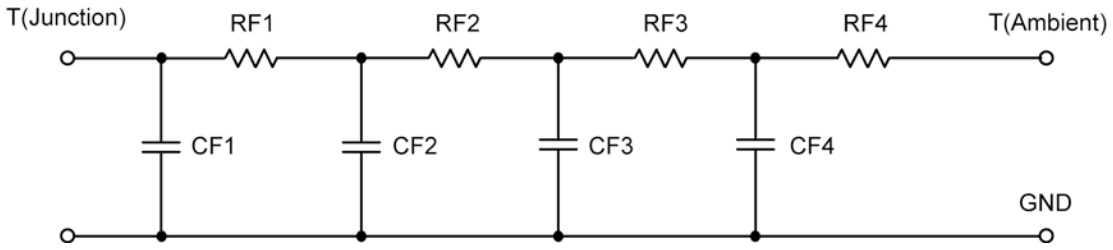
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.4461	793.3107 m	N/A
RT2	8.0131	405.4676 m	N/A
RT3	13.0036	407.3656 m	N/A
RT4	26.5372	193.8561 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.1510 m	14.1720 m	N/A
CT2	134.7338 m	3.7300 m	N/A
CT3	2.9027	292.7908 m	N/A
CT4	3.1549	1.8676 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

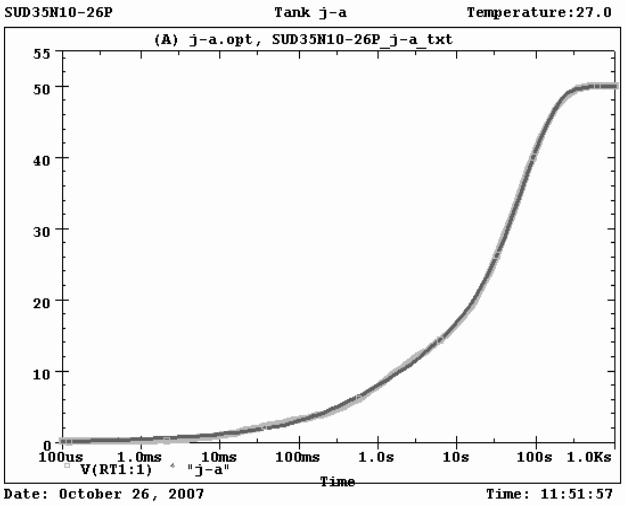


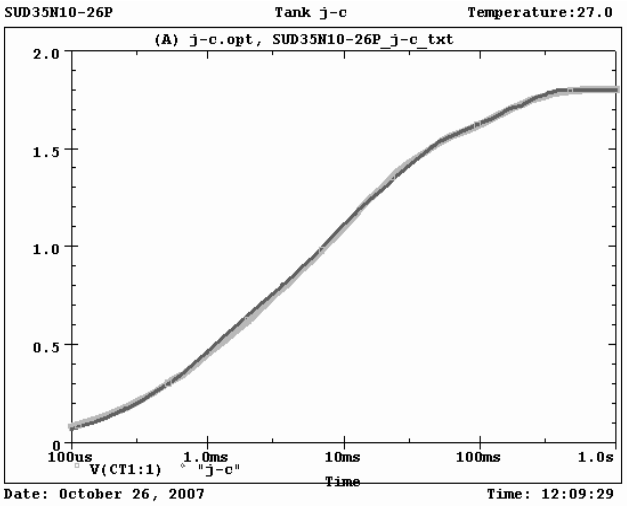
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.0398	672.5108 m	N/A
RF2	9.0838	111.7113 m	N/A
RF3	31.9999	697.8688 m	N/A
RF4	5.8765	317.9091 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	10.1278 m	1.3056 m	N/A
CF2	124.8509 m	8.3228 m	N/A
CF3	1.4636	5.1364 m	N/A
CF4	8.0543	410.5042 m	N/A

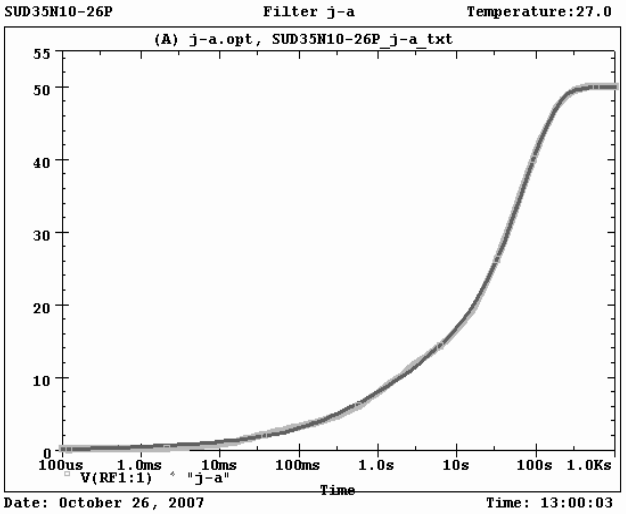
Note: NA indicates not applicable

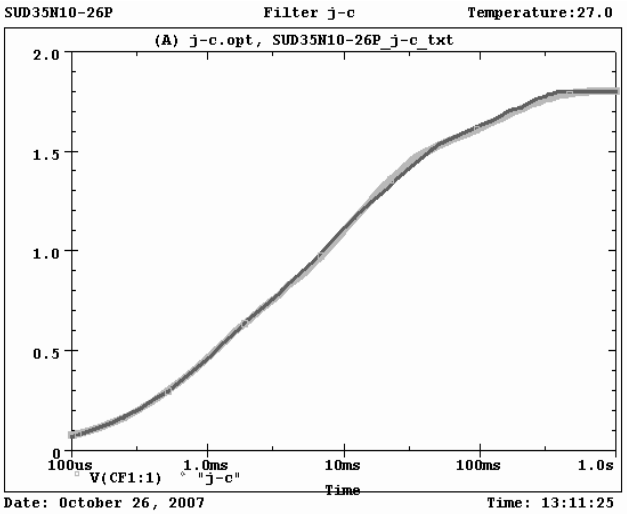
Reference:

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


SUD35N10-26P
Tank j-a
Temperature:27.0
(A) j-a.opt, SUD35N10-26P_j-a_txt
55
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: October 26, 2007
Time: 11:51:57


SUD35N10-26P
Tank j-c
Temperature:27.0
(A) j-c.opt, SUD35N10-26P_j-c_txt
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: October 26, 2007
Time: 12:09:29


SUD35N10-26P
Filter j-a
Temperature:27.0
(A) j-a.opt, SUD35N10-26P_j-a_txt
55
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: October 26, 2007
Time: 13:00:03


SUD35N10-26P
Filter j-c
Temperature:27.0
(A) j-c.opt, SUD35N10-26P_j-c_txt
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: October 26, 2007
Time: 13:11:25