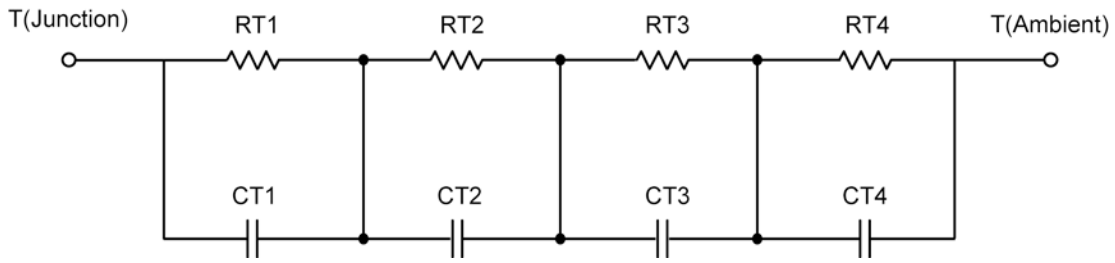
R-C Thermal Model Parameters

DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included. When implemented in P-Spice, these values have matching characteristic curves to the single-pulse transient thermal impedance curves for the MOSFET.

These RC values can be used in the P-SPICE simulation to evaluate the thermal behavior of the MOSFET junction temperature under a defined power profile. These techniques are described in Application Note AN609, "Thermal Simulation of Power MOSFETs on the P-Spice Platform."

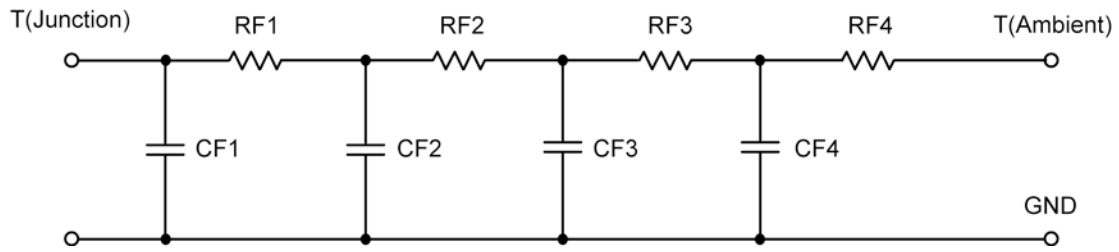
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.0433	N/A	1.1897
RT2	47.5828	N/A	6.5109
RT3	16.7784	N/A	9.1580
RT4	16.5955	N/A	5.1414
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.9807 m	N/A	1.8262 m
CT2	1.2790	N/A	47.5943 m
CT3	35.7956 m	N/A	176.5011 m
CT4	151.9036 m	N/A	10.1322 m

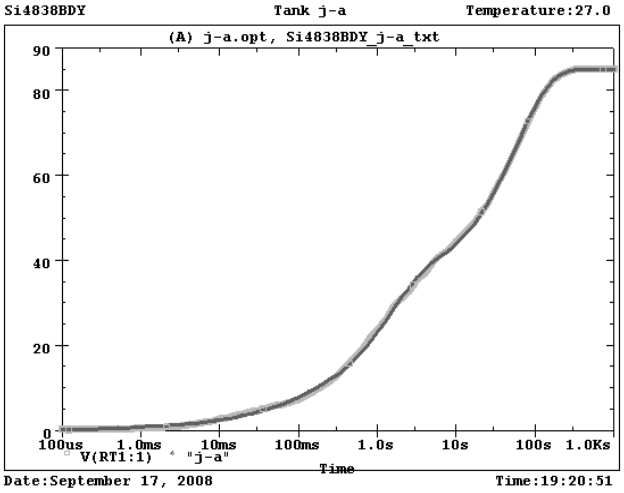
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

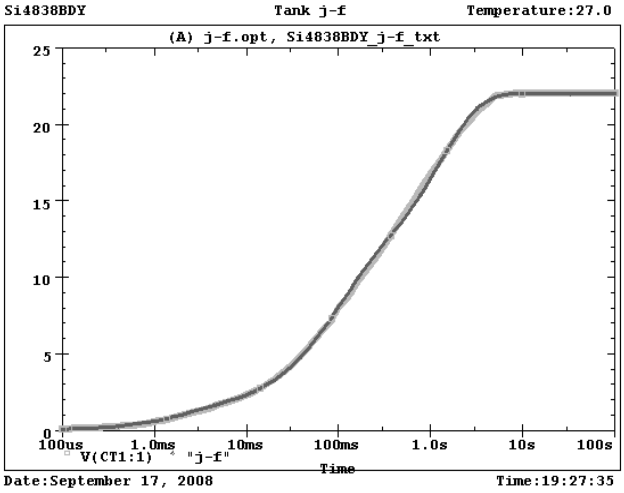
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.0929	N/A	1.9703
RF2	27.7159	N/A	7.7350
RF3	20.3491	N/A	6.5026
RF4	28.8421	N/A	5.7921
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.1473 m	N/A	1.6693 m
CF2	35.8596 m	N/A	7.3641 m
CF3	743.6488 m	N/A	46.7382 m
CF4	1.0976	N/A	132.2475 m

Note
NA indicates not applicable


Si4838BDY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4838BDY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:September 17, 2008
Time:19:20:51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Tank j-f
Temperature:27.0
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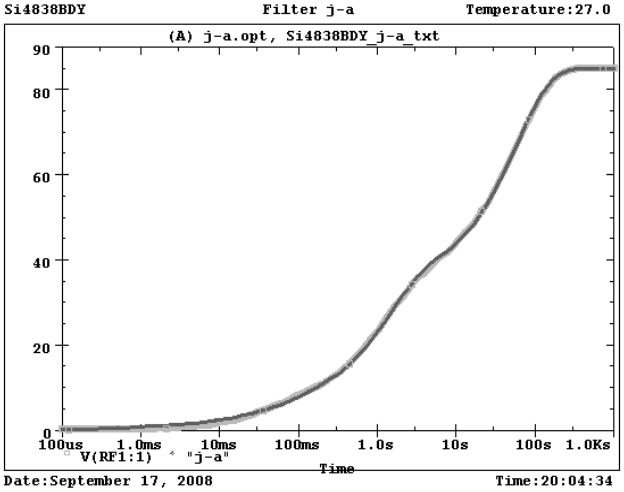
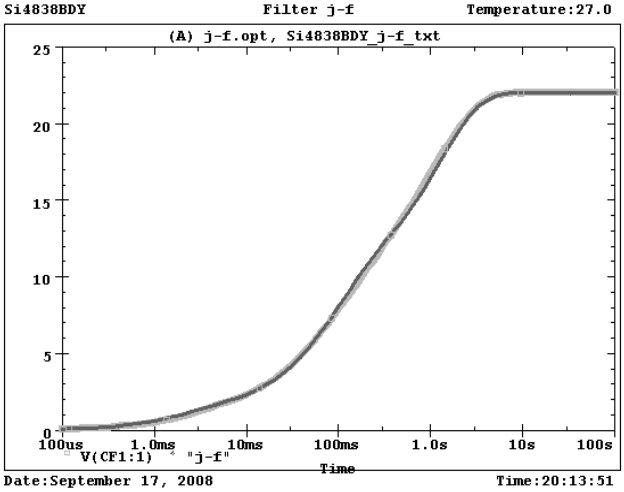
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-f"
Time
Date:September 17, 2008
Time:19:27:35


Si4838BDY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4838BDY_j-a_txt
90
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:September 17, 2008
Time:20:04:34


Si4838BDY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4838BDY_j-f_txt
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date:September 17, 2008
Time:20:13:51