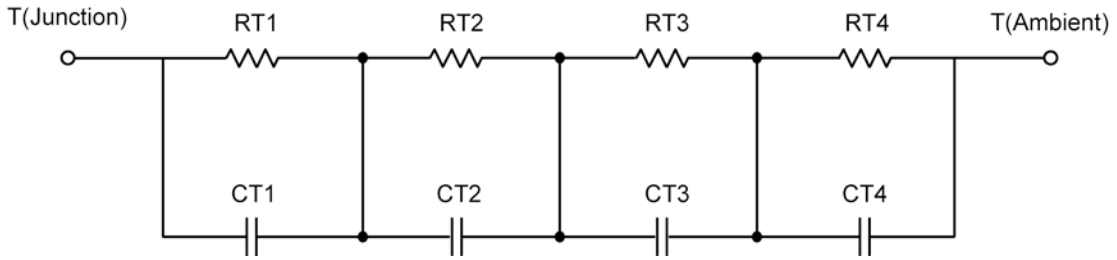
R-C Thermal Model Parameters

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."

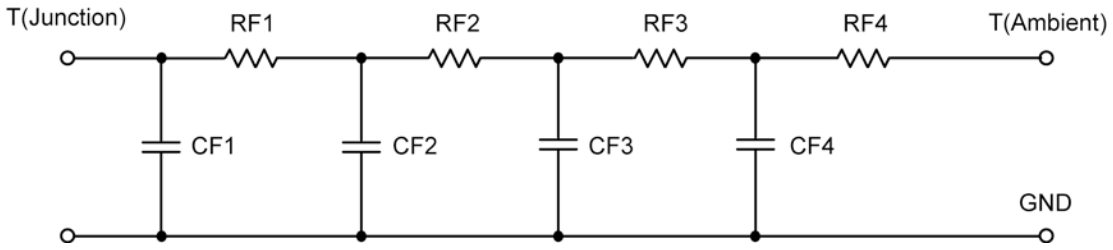
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	4.2360	N/A	8.8222
RT2	23.1091	N/A	8.3346
RT3	10.7927	N/A	6.3964
RT4	51.8622	N/A	1.4468
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.7697 m	N/A	188.4095 m
CT2	76.4367 m	N/A	26.9507 m
CT3	30.8322 m	N/A	9.6798 m
CT4	1.2462	N/A	1.4592 m

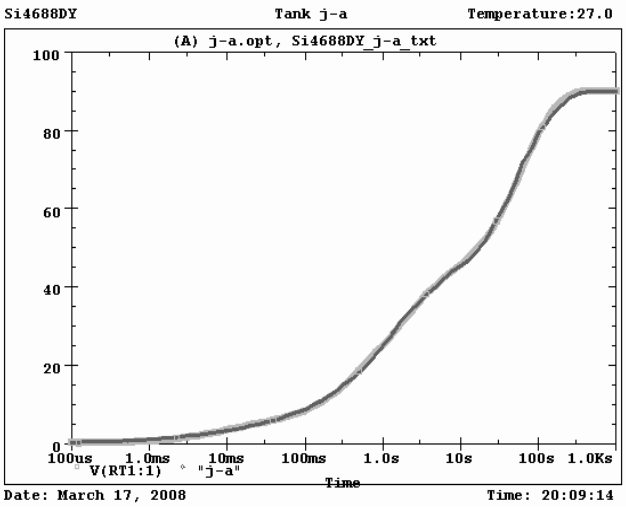
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

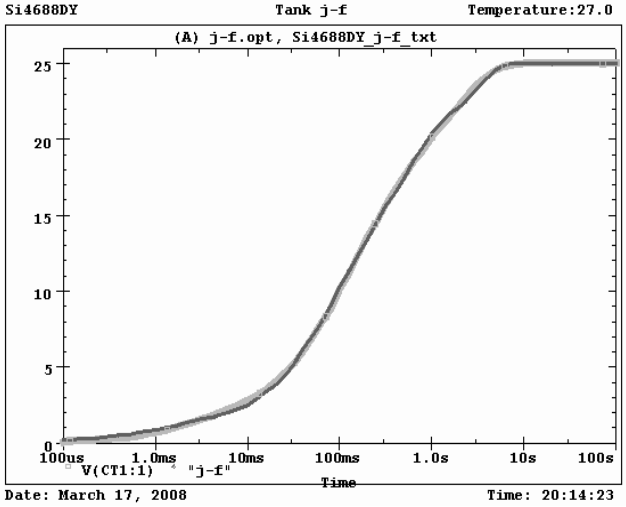
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.0404	N/A	1.2758
RF2	30.5486	N/A	8.0257
RF3	36.0109	N/A	8.4925
RF4	16.4001	N/A	7.2060
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.3510 m	N/A	868.6215 u
CF2	32.3812 m	N/A	4.3125 m
CF3	928.7569 m	N/A	13.9642 m
CF4	2.7834	N/A	186.2520 m

Note: NA indicates not applicable


Si4688DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4688DY_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: March 17, 2008
Time: 20:09:14


Si4688DY
Tank j-f
Temperature:27.0
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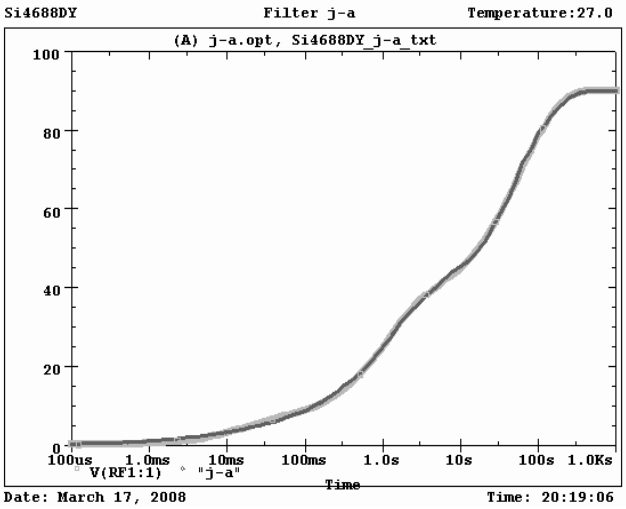
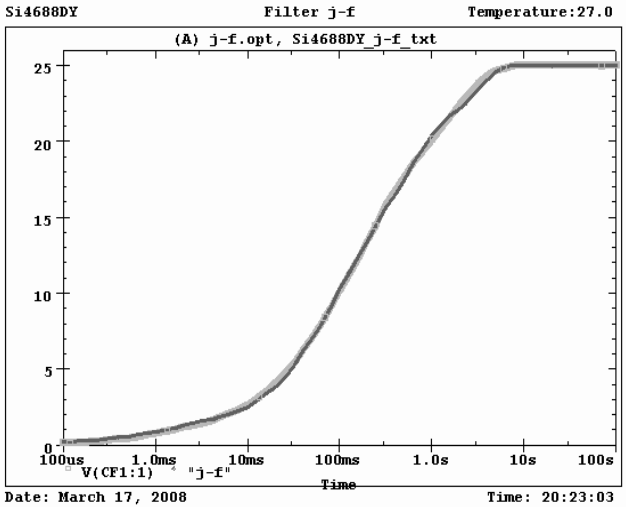
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-f"
Time
Date: March 17, 2008
Time: 20:14:23


Si4688DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4688DY_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: March 17, 2008
Time: 20:19:06


Si4688DY
Filter 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(CF1:1)
"j-f"
Time
Date: March 17, 2008
Time: 20:23:03