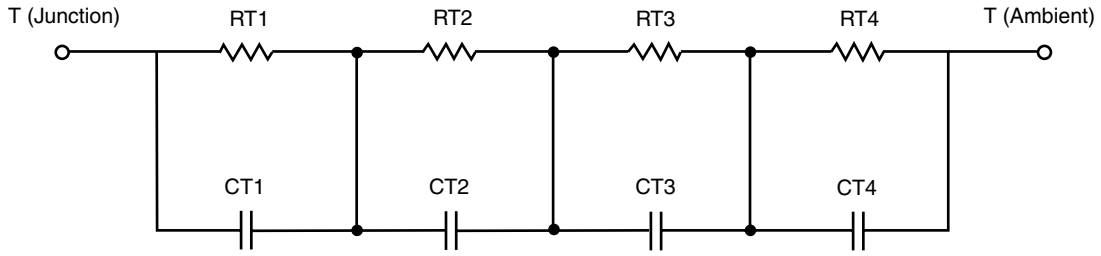
R-C Thermal Model Parameters

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

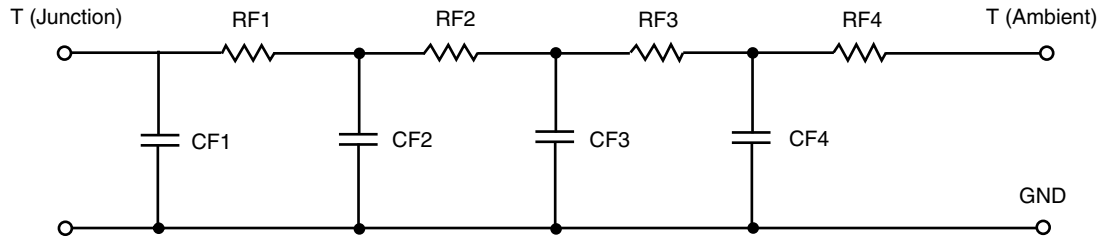


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.8681	N/A	10.0074
RT2	4.1417	N/A	2.9751
RT3	11.3454	N/A	2.8105
RT4	52.6448	N/A	207.0000 m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	224.8986 m	N/A	138.3434 m
CT2	13.1646 m	N/A	24.1195 m
CT3	78.7572 m	N/A	38.8955 m
CT4	1.5045	N/A	4.5394 m

Note
N/A indicates not applicable

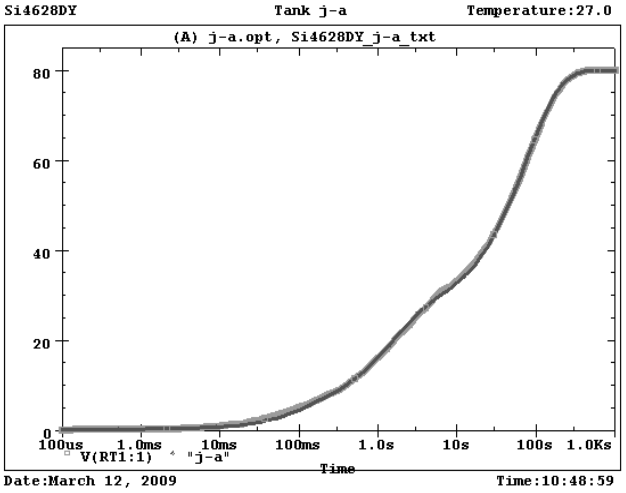
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

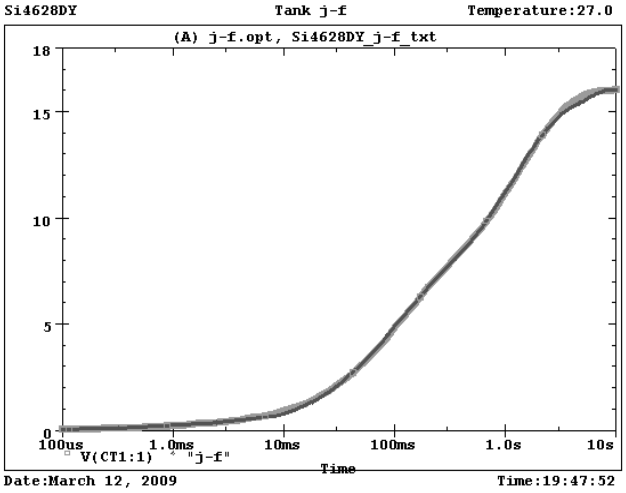
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.5121	N/A	1.2759
RF2	10.0930	N/A	5.9807
RF3	11.5312	N/A	7.9350
RF4	50.8637	N/A	808.4000 m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	13.6712 m	N/A	7.7086 m
CF2	38.9872 m	N/A	7.8224 m
CF3	112.5787 m	N/A	128.7286 m
CF4	1.3101	N/A	3.1651

Note
N/A indicates not applicable


Si4628DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4628DY_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:March 12, 2009
Time:10:48:59


Si4628DY
Tank j-f
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18
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
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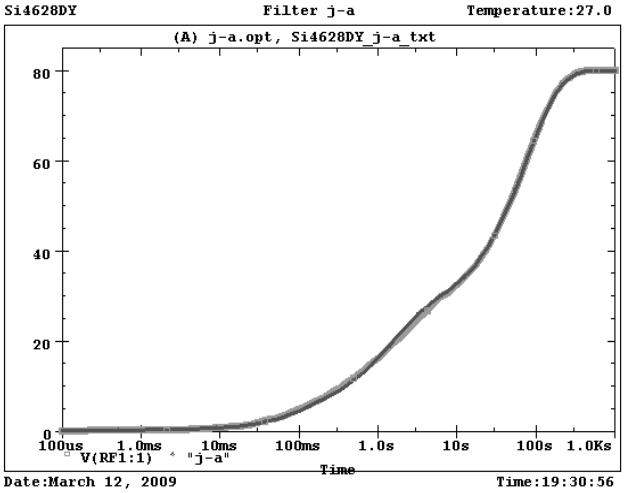
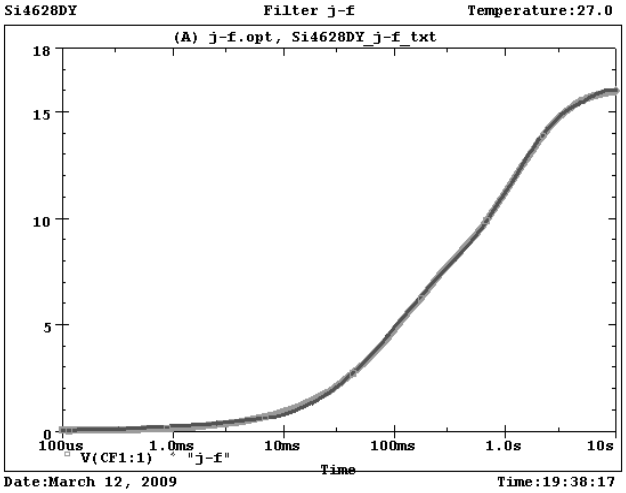
Time
Date:March 12, 2009
Time:19:47:52


Si4628DY
Filter j-a
Temperature:27.0
(A) j-a.opt, Si4628DY_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:March 12, 2009
Time:19:30:56


Si4628DY
Filter j-f
Temperature:27.0
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18
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)
"j-f"
Time
Date:March 12, 2009
Time:19:38:17