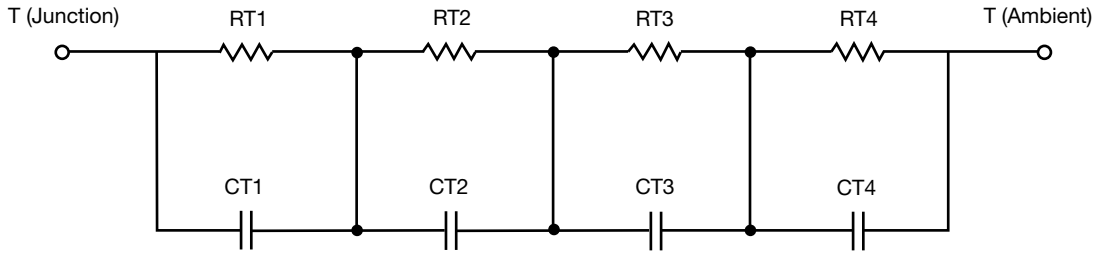
R-C Thermal Model Parameters

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

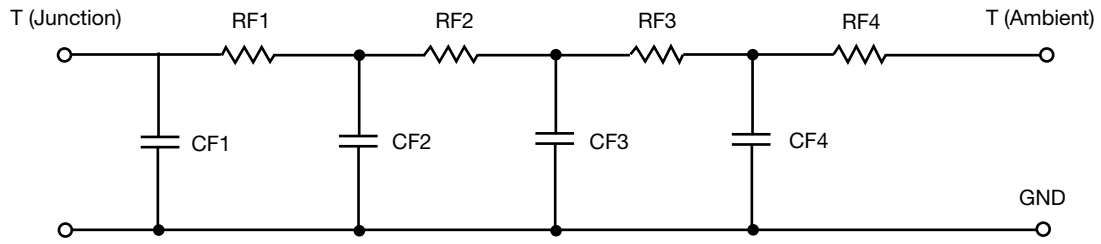


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	27.7679	N/A	5.1992
RT2	29.8340	N/A	7.8303
RT3	7.1895	N/A	7.2353
RT4	20.2664	N/A	1.7410
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	46.9550m	N/A	355.8017m
CT2	1.5905	N/A	89.3238m
CT3	7.4857m	N/A	6.9262m
CT4	4.0651	N/A	1.3626m

Note
N/A indicates not applicable

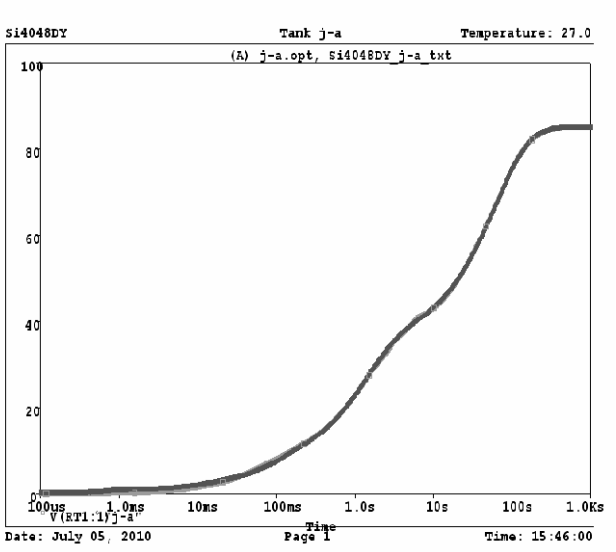
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

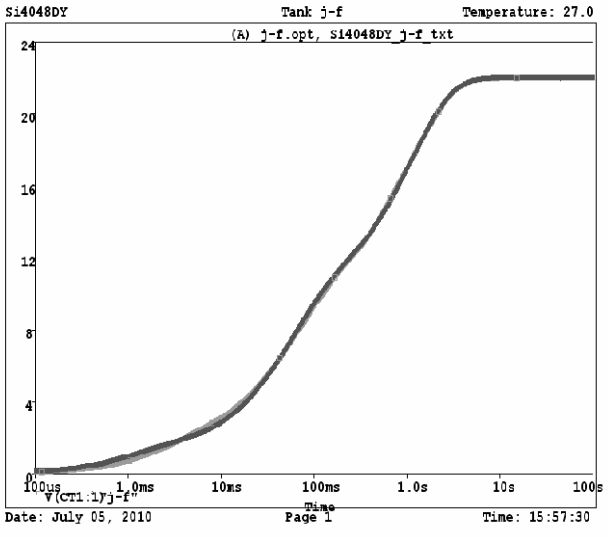
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.1257	N/A	1.8041
RF2	31.5477	N/A	9.8110
RF3	24.4130	N/A	5.7352
RF4	23.8116	N/A	4.6549
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	2.2792m	N/A	650.3513u
CF2	33.1989m	N/A	6.3370m
CF3	1.0598	N/A	100.1471m
CF4	564.4528m	N/A	38.7777m

Note
N/A indicates not applicable


Si4048DY
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si4048DY_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: July 05, 2010
Page 1
Time: 15:46:00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Tank j-f
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16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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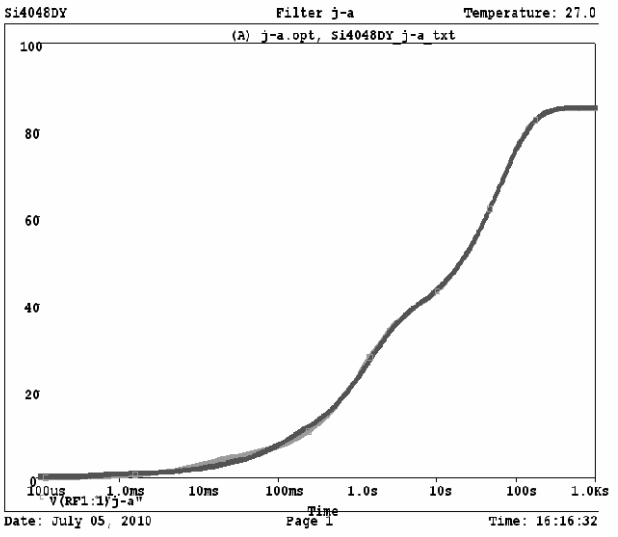
Time
Date: July 05, 2010
Page 1
Time: 15:57:30


Si4048DY
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si4048DY_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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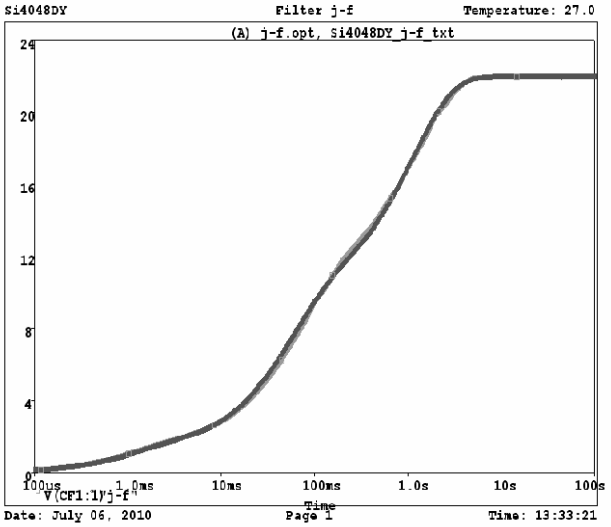
Time
Date: July 05, 2010
Page 1
Time: 16:16:32


Si4048DY
Filter j-f
Temperature: 27.0
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24
20
16
12
8
4
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)"j-f"
Time
Date: July 06, 2010
Page 1
Time: 13:33:21