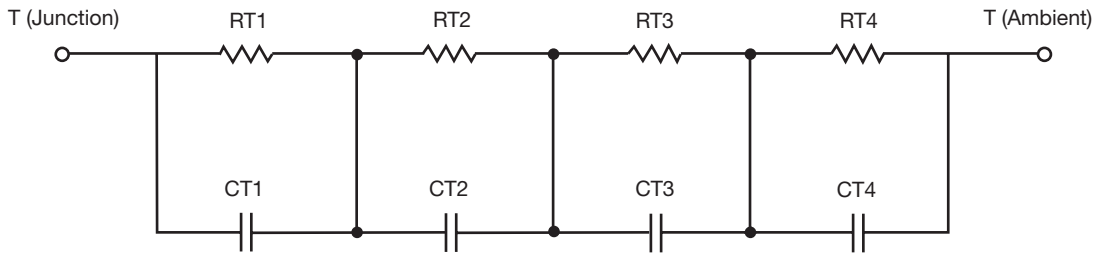
R-C Thermal Model Parameters

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

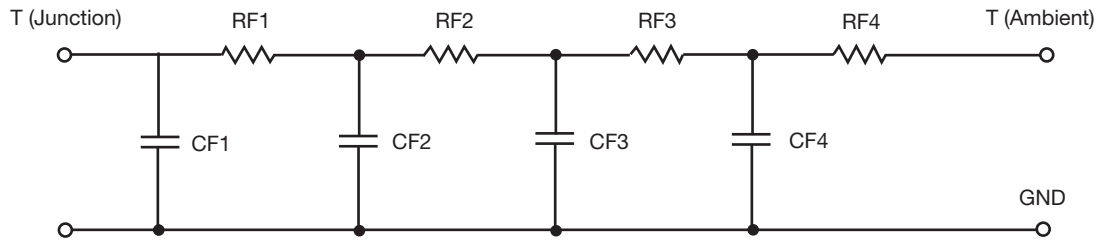


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	23.6265	N/A	14.0610
RT2	20.9029	N/A	12.8193
RT3	11.1101	N/A	9.0099
RT4	54.3605	N/A	3.9088
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	15.0479m	N/A	78.1808m
CT2	134.0051m	N/A	4.6014m
CT3	1.9097m	N/A	15.3215m
CT4	1.3707	N/A	431.6834u

Note
N/A indicates not applicable

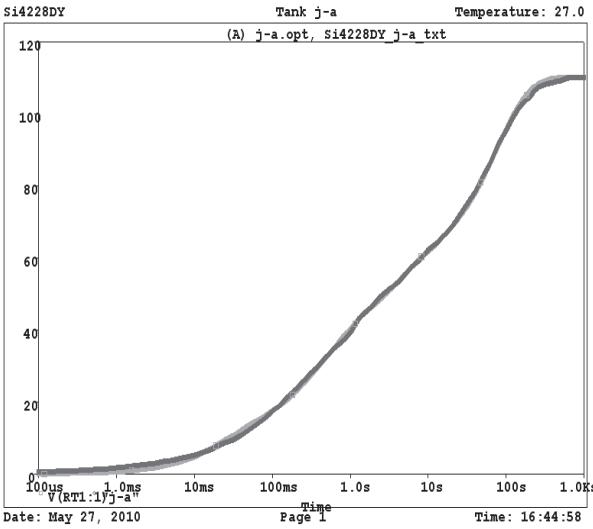
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

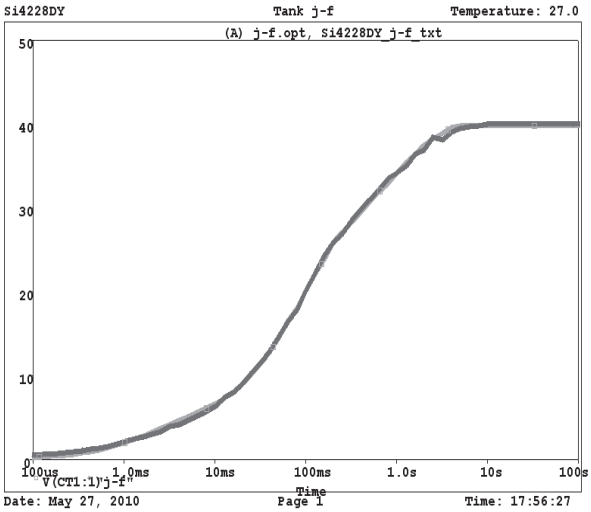
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.3685	N/A	4.1528
RF2	26.9574	N/A	18.1112
RF3	25.0852	N/A	11.5649
RF4	51.5889	N/A	6.2301
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	736.1613u	N/A	370.3832u
CF2	6.1920m	N/A	2.5799m
CF3	78.7658m	N/A	20.6769m
CF4	1.3476	N/A	271.6927m

Note
N/A indicates not applicable


Si4228DY
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si4228DY_j-a_txt
120
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)'j-a"
Time
Date: May 27, 2010
Page 1
Time: 16:44:58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Tank j-f
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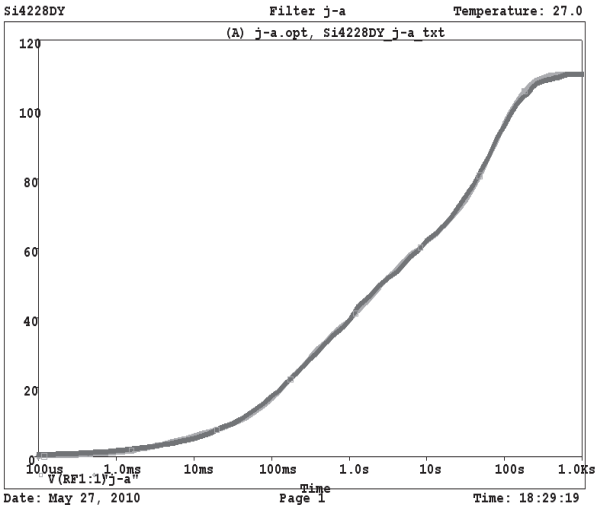
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)'j-f"
Time
Date: May 27, 2010
Page 1
Time: 17:56:27


Si4228DY
Filter j-a
Temperature: 27.0
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100
80
60
40
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0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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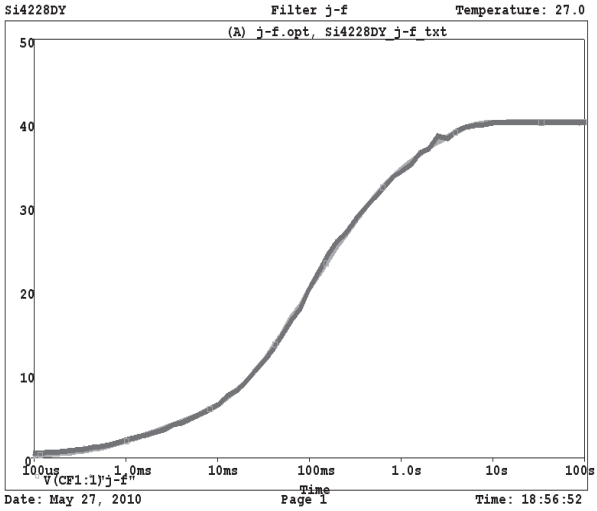
Time
Date: May 27, 2010
Page 1
Time: 18:29:19


Si4228DY
Filter j-f
Temperature: 27.0
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50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)'j-f"
Time
Date: May 27, 2010
Page 1
Time: 18:56:52