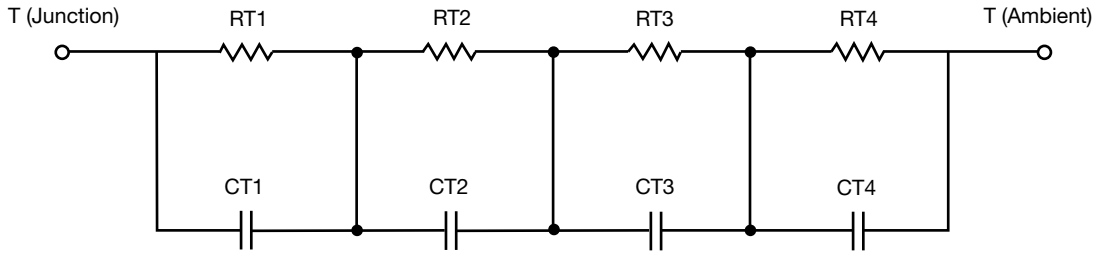
R-C Thermal Model Parameters

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

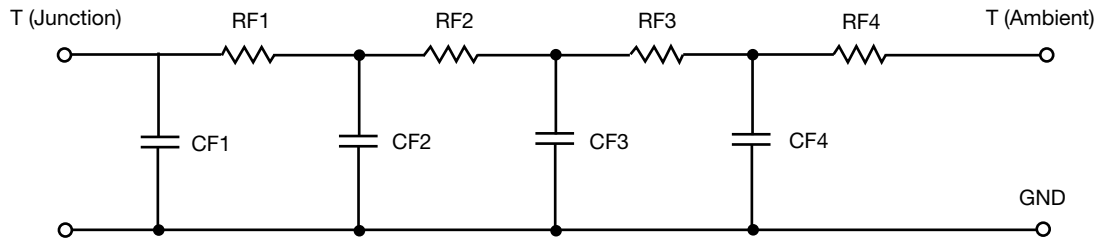


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	32.8548	N/A	7.1460
RT2	26.7348	N/A	24.3475
RT3	9.1333	N/A	7.1975
RT4	55.7145	N/A	6.3132
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3878m	N/A	119.7290m
CT2	34.3007m	N/A	1.3671m
CT3	269.4448u	N/A	9.8963m
CT4	1.2572	N/A	160.7712u

Note
N/A indicates not applicable

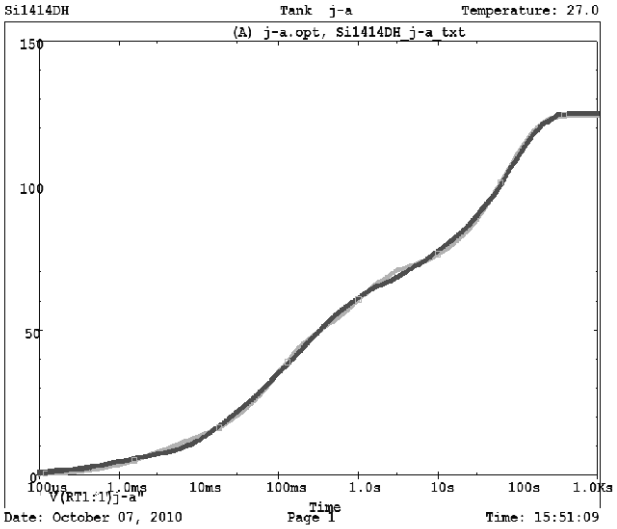
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	8.5805	N/A	2.4817
RF2	31.9082	N/A	7.6578
RF3	28.5328	N/A	27.9409
RF4	55.3027	N/A	6.8118
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	192.0794u	N/A	79.2514u
CF2	1.4945m	N/A	183.3458u
CF3	20.0489m	N/A	1.1674m
CF4	1.2080	N/A	98.2840m

Note
N/A indicates not applicable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Tank j-a
Temperature: 27.0
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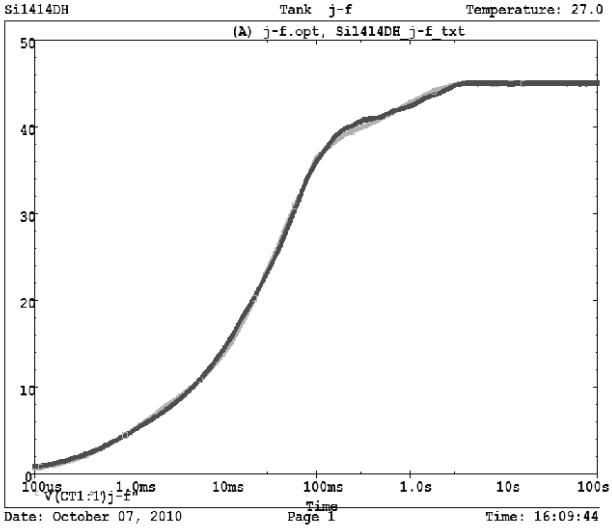
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 07, 2010
Page 1
Time: 15:51:09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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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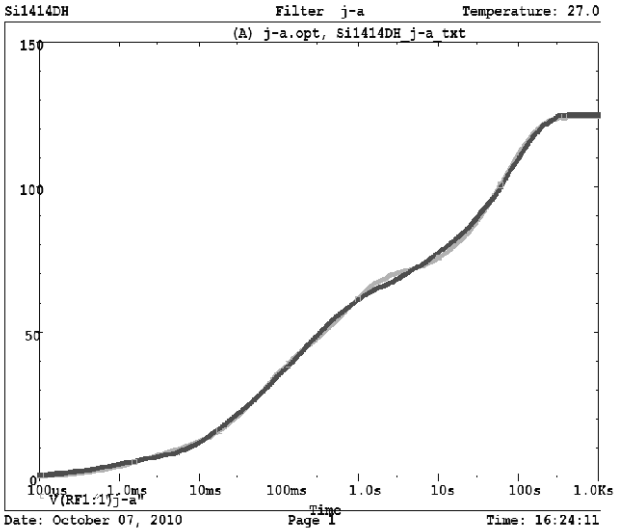
Time
Date: October 07, 2010
Page 1
Time: 16:09:44


Si1414DH
Filter j-a
Temperature: 27.0
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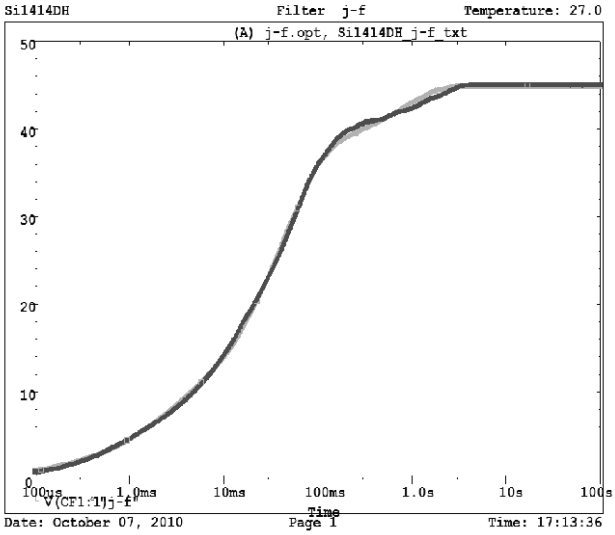
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: October 07, 2010
Page 1
Time: 16:24:11


Si1414DH
Filter j-f
Temperature: 27.0
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40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)j-f
Time
Date: October 07, 2010
Page 1
Time: 17:13:36