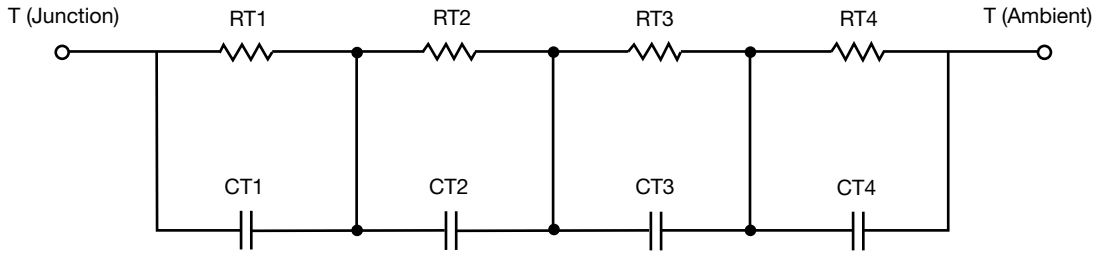
R-C Thermal Model Parameters

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

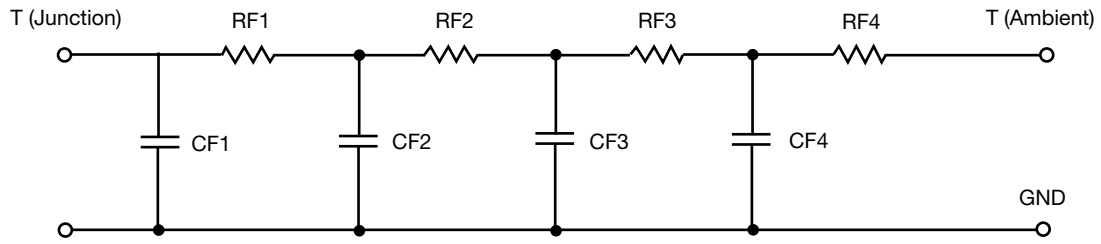


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.8491	N/A	8.6552
RT2	42.6563	N/A	34.3108
RT3	41.8008	N/A	21.7200
RT4	71.6938	N/A	10.3144
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	149.6769u	N/A	31.0975m
CT2	11.1763m	N/A	1.6753m
CT3	1.2261m	N/A	844.5338u
CT4	1.0888	N/A	133.3514u

Note
N/A indicates not applicable

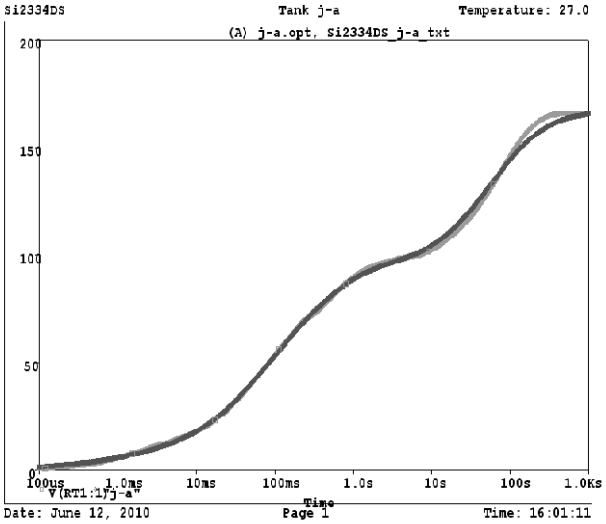
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

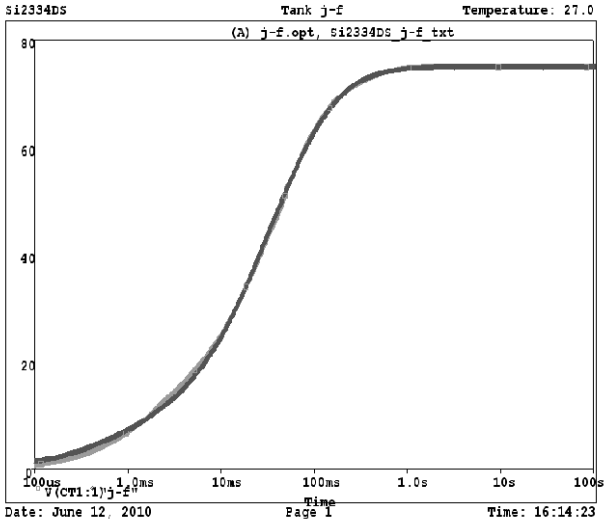
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.7856	N/A	15.9694
RF2	53.2710	N/A	30.4082
RF3	27.8023	N/A	20.2091
RF4	69.1411	N/A	8.3114
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	169.5741u	N/A	118.3001u
CF2	1.2698m	N/A	441.9956u
CF3	23.2854m	N/A	1.1550m
CF4	1.1445	N/A	17.8156m

Note
N/A indicates not applicable


Si2334DS
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si2334DS_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)"j-a"
Time
Date: June 12, 2010
Page 1
Time: 16:01:11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Tank j-f
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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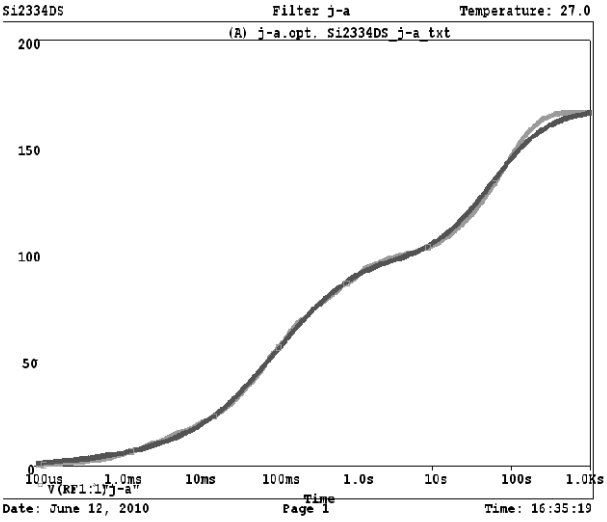
Time
Date: June 12, 2010
Page 1
Time: 16:14:23


Si2334DS
Filter j-a
Temperature: 27.0
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200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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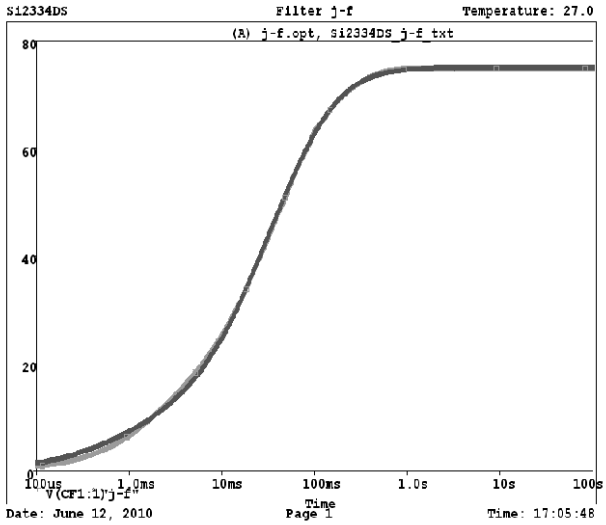
Time
Date: June 12, 2010
Page 1
Time: 16:35:19


Si2334DS
Filter j-f
Temperature: 27.0
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80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)"j-f"
Time
Date: June 12, 2010
Page 1
Time: 17:05:48