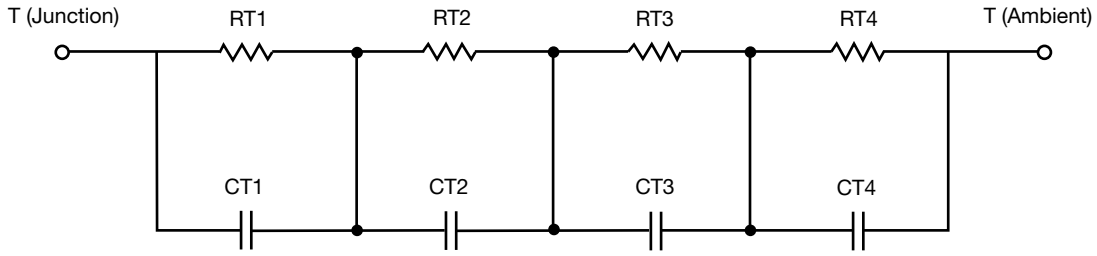
R-C Thermal Model Parameters

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

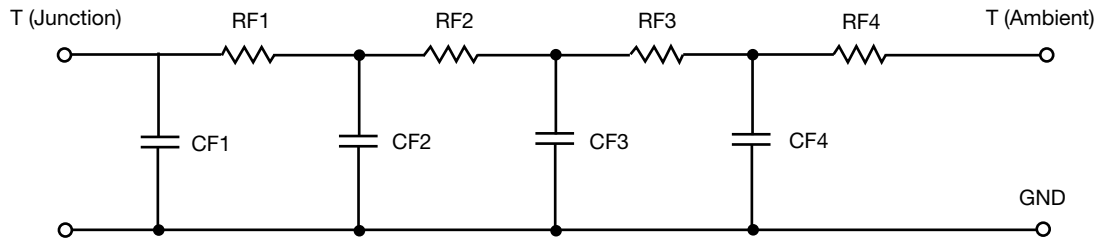


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	9.8491	N/A	8.2312
RT2	42.6563	N/A	26.2727
RT3	41.8008	N/A	10.5374
RT4	71.6938	N/A	4.7969
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	143.1562u	N/A	194.4648m
CT2	15.7258m	N/A	15.4392m
CT3	3.3587m	N/A	7.9524m
CT4	991.3470m	N/A	549.0647u

Note
N/A indicates not applicable

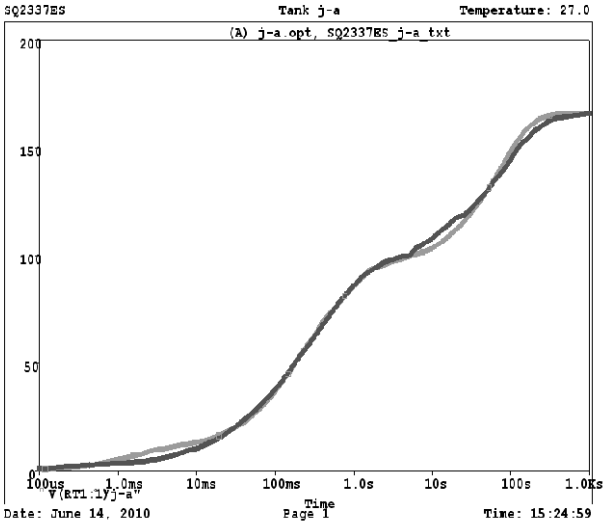
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

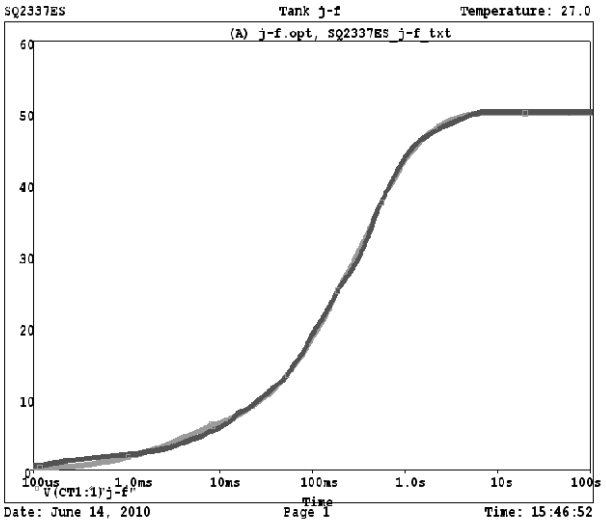
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	15.7856	N/A	13.4319
RF2	53.2710	N/A	29.8354
RF3	27.8023	N/A	6.0488
RF4	69.1411	N/A	853.7574m
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	513.7201u	N/A	1.3912m
CF2	2.5364m	N/A	9.8070m
CF3	18.6936m	N/A	127.7124m
CF4	1.0435	N/A	26.9010

Note
N/A indicates not applicable


SQ2337ES
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ2337ES_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 14, 2010
Page 1
Time: 15:24:59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Tank j-f
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50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
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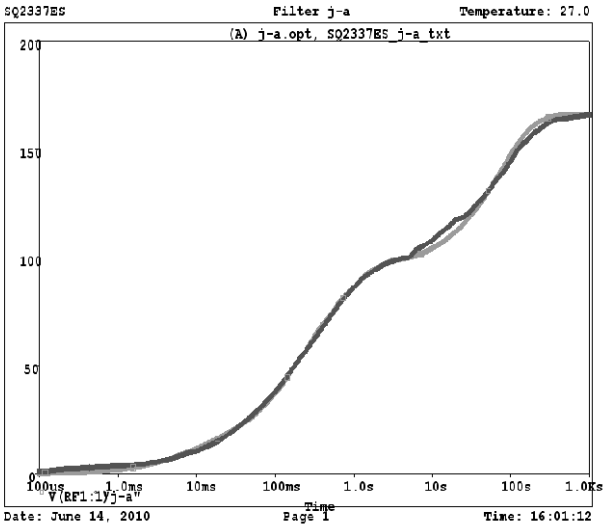
Time
Date: June 14, 2010
Page 1
Time: 15:46:52


SQ2337ES
Filter j-a
Temperature: 27.0
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150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0ks
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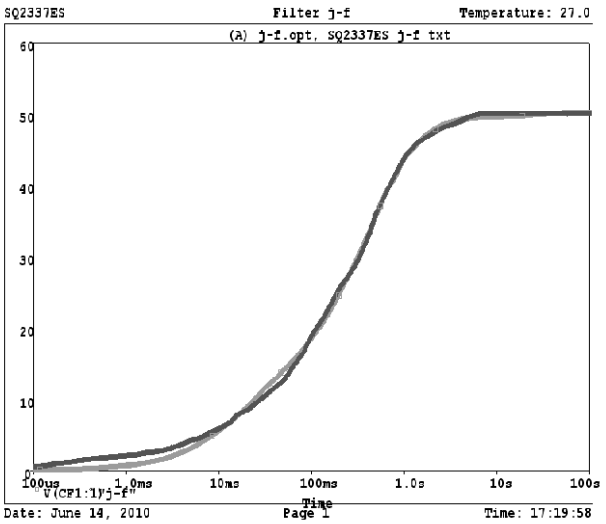
Time
Date: June 14, 2010
Page 1
Time: 16:01:12


SQ2337ES
Filter j-f
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60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)j-f"
Time
Date: June 14, 2010
Page 1
Time: 17:19:58